Sustainable Development and the Future of Cities

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ed. by Bernd Hamm,
Gertrud Zimmer
and Sabine Kratz

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INTRODUCTION

Bernd Hamm

The 1991 International Summer Seminar on Sustainable Development and the Future of Cities was an overwhelmingly stimulating and exiting event. 34 participants from 16 countries (Africa, Asia, North America, Eastern and Western Europe), from all age groups between 19 and 69, from many different disciplines, professions and career phases have been working together in an environment which is unique in its creative tradition and atmosphere and has a genuine genius loci, i.e. the Bauhaus in Dessau. The seminar was part of the cooperation between the Bauhaus Dessau and the Centre for European Studies, Trier University. As it is often the case, this cooperation goes back to the friendship between two people, Rolf Kuhn and myself, who met first in 1986 under the conditions of the old German Democratic Republic. When Rolf took office in 1987, we quickly started working together in a number of different areas, so the Bauhaus became a familiar place for me. In the meanwhile, our cooperation is firmly established. It is intended in this framework to organize this seminar regularly in late summer, provided that the necessary funding can be secured. This present seminar had received funds from UNESCO's futures studies unit, from the German Commission for UNESCO which holds a patronage over the Centre for European Studies, and from the Federal Ministry for Education and Science.

The seminar had no fixed programme in the sense of the usual bunch of lectures-type of events. Instead, participants were asked to think carefully about the hopes and expectations which motivated them to attend, and to present these ideas to the first plenary. After this, we built three working groups on (a) the future of cities, (b) the transition from socialism to citalism, and (c) planning processes. Regular plenary meetings and short group protocols allowed vivid interaction between all. Each of the invited resource persons was asked to bring lectures in his or her specialty along which could enter into the discussion in an appropriate moment. It was even possible to spontaneously invite local experts in order to test some of the ideas developed in one of the groups. And many brought contributions for evening sessions, in the form of slide shows or lectures. Thus, the substantial topics of the seminar were not imposed by the organizer but rather developed out of the discussion process, and a non-hierarchical, argument-based style of cooperation evolved. Some concrete results were achieved to which I shall refer in section three of this introduction.

The world is changing dramatically. We are on the way of becomming one global society. Interdependence is rapidly increasing, only our perception is still lagging behind. The events in the USSR on August 19th and 20th were not the first to make clear how much we depend in our everyday lives on circumstances shaped elsewhere. We were together in the Bauhaus to work with, and learn from, each other which would have been close to impossible for many only two years ago, and which might have turned to impossible again only three weeks before the seminar began.

One of the firm pillars on which the world of yesterday was built is staggering: the nation-state. It is threatened from two sides: transnational corporations, non-governmental organizations and supranational institutions, global financial and economic interdependence and global media and

communication are part of a process of scaling up. Social movements, local and regional cultural identities, infrastructure and service delivery, the revival of dialects and local customs are part of a process of scaling down. Between the two, not much remains left for the nation-state of today. Society will happen on two increasingly different levels: one anonymous, strange and alien for the majority, the level of opaque bureaucracies, of international finance and world economy which sets the framing conditions for the development of all of us, the world of big business and of decisions made in organizations which are too far to be of real interest even if one would suffer from the results - and one of everyday life, of real people, of housing and work, of commuting, shopping, leisure, education, and neighboring.

This second, the lower level of society is essentially urban. Following the famous definition of Louis Wirth, a city is a relatively big place in which a relatively heterogeneous population lives in relatively high density. In societies which call themselves developed, some 70 to 80 per cent of the population live in such urban areas. All others in the affluent capitalist West are culturally urbanized insofar as they follow urban standards of consumption and education, in their attitudes, media usage, and behavioral patterns. As we know well from empirical research, remaining differences between urban and non-urban populations are much more due to differences in social class and in life-cycle position, i.e. to the socio-spatial segregation of populations, than due to differences in community size. Those societies which we like to call developing and which, in our views, now include Eastern Europe are societies in a process of rapid and often dramatic urbanization, mostly due to rural-urban migration. We know relatively much about this process which occured in Europe in the 19th century, and we know that there is little hope to change its direction. Theories of urbanization processes, based on the theory of demographic transition, the theory of economic transition, and migration theory, are well-established and widely agreed upon. They allow us to predict that the society of tomorrow is, on a global scale, an urban society. Urban societies, however, are far from being paradise-like places to live in. The number of problems is almost immeasurable: energy supply, urban traffic, water pollution, solid waste disposal, polluting industries, environmental education; unemployment, poverty, homelesness, crime and security, drugs, mental and physical health, alcohol, one parent families; jobs, income, housing, opportunities for the young, education, care for the elderly, power, citizen participation, ethnicity, social segregation, discrimination -- the biggest problem is complexity, because all those mentioned and many others are closely interrelated, mutually interdependent, and reinforcing.

In addition to all this, cities are far away from being self-contained, independent, autonomous units in any reasonable sense. They are executive agents for national and provincial governments, they depend on the locational choice of private enterprise, they are at the receiving end of national policies as well as of international economic and financial developments. New technologies, changing demographic composition of populations, the new and massive migration streams - there is no way for cities to exercise any control over such processes of which they are victims. There is very little they can decide in their own right, and very much they are blamed for. This is where the two levels of society, the global and the local, interact most intensively. Urban policy has to cope with missionaries and mafiosi, with ambition and parochialism, with dedication and incompetence, and first of all with short terms of office.The margins for manoeuvre are tight, and the city budgets even tighter.

The global society, however, is in deep crisis. Severe environmental damages, increasing socio-economic disparities between the rich and the poor, mass migration, the blind race for economic growth, tensions and conflict within and between nations, aggressive arrogance of power and non-existing effective gouvernance of international systems together produce synergetic effects which bring humankind to the abyss of global catastrophes. We are at a turning point: even if we manage to prevent the extinction of the human species by nuclear war, survival might be threatened by the consciousless and unresponsible ways in which the rich exploit the resources of all. The Club of Rome was not tired to issue one warning after the other, from The Limits to Growth to its 1991 Report. In this situation, the Brundtland Commission introduced two new concepts, i.e. sustainability and sustainable development. Although only vaguely defined in operational terms, the idea behind these concepts is easy to understand. Sustainable development is a process in which the global society lives in harmony with its nonhuman environment. The direction and margins of global change are determined by the carrying capacity of nature, and society invests a good deal of intellectual and material resources to adapt to its natural conditions and regenerate the resources used. Sustainable society is a goal towards which we must strive for the sake of survival of ourselves and of future generations.

Sustainability is a global concept. It has deepest implications on both levels of society. If we allow or even support the terms of trade to deteriorate further at cost of the Third World, if we continue to pretend that the policies of, e.g., the International Monetary Fund are determined by some kind of natural law, and if we continue to destroy local problem solving capacities by what we call development aid and debts crisis, we must not be surprised when the Third World knocks on the doors of our cities and demands to be let in. A person unemployed in Zimbabwe or Bangladesh is as much a problem as a person unemployed in Germany or the United States, and poverty, malnutrition, discrimination and desease, wherever on earth they occur, affect us all as does the destruction of tropical rain forests, the greenhouse effect, and the damages in the ozone layer. As urban areas are the places where large proportions of the population life or will life in the future, sustainability must be achieved for urban societies. If, e.g., the richest 25 per cent of the global population consume some 80 per cent of the total primary energy, then this means that only urban societies can considerably change their patterns of energy consumption with any noticeable global effect. While the 1980s were a lost decade for development, as Willy Brandt has said and as the South Commission has recently reiterated, we now must understand that development aid which only serves our own interests in the capitalist Western countries has definitely come to an end. We are in control of international trade and finance and of the respective institutions. The new questions must be what development aid in the interest of others can really be, and how it can be introduced and work most effectively, and how international economic institutions can be democratized. We never thought in such terms. It might be that the conditions for such change are better now, after the end of the communist regimes.

Sustainability is a comprehensive, a holistic concept. It does not allow us to cut the world into small disciplinary pieces which may then offer themselves for exploitation in the interest of professional experts. There is no such thing like an isolated environmental sustainability which can adequately be treated in terms of chemical reactions. There is no environment independent of the economy which regulates how resources are used, and there is no economy independent of political and social organization regulating the distribution of power and of the possibility to appropriate profits, benefits and privileges at cost of others. There is no social sustainability without personal security, human rights, and social justice, without a fair distribution of life-

chances and without self-determination. There can be no economic sustainability if resources are overexploited, if communities depend in their employment and income exclusively on one enterprise or product, or if external economic conditions are unjust and exploitative. Disciplinary claims serve much more to disguise this important insight than to discover it. We have good reasons to distrust experts of all sorts.

Sustainability is a critical concept. It defies present-day reality and confronts such reality with a utopian vision of a better world. We need such visions to understand the deficiencies of our world, to ask the relevant questions, and to help us find the right decisions.
While it is useful to work on operational definitions to use the concept more frequently and more prominently in scientific discourse, sustainability even now serves in a critical function which is necessary in the political debate. The idea of a sustainable society composed of sustainable cities carries a heavy burden of hopes and expectations. Economic sustainability refers to an industry mix which allows for relative stability in employment for the urban polupation, for a production of goods and services which do no longer exclusively follow the rules of exchange value, and for environmentally harmless ways of production. Social sustainability cannot be separated from social justice and equity in choices and opportunities. Environmental sustainability demands for a sharp reduction in the consumption of resources together with a sharp reduction in pollution. Sustainability, however, is not a concept refering to a kind of static paradise but rather a capacity of human beings to adapt to their nonhuman environments by means of social organization. In short: Sustainability indicates the end of the affluent industrial society in some parts of the world and points, at the same time, to a future which will not survive if it is not more peaceful, more socially just, and more respectful to the environment. However, we can feel that the phase of social change we are in already is, and will become even more, dramatic. Sustainability means that we are responsible for the survival of mankind.

Sustainability is not a passive destiny, but a challenge for all of us to act. Environmental damages do not come out of nowhere but are mostly unintended consequences of purposeful action, i.e. they go back to decisions made by people. It is true that some people do follow their individual self-interest with reckless egoism. But much more important is it to understand how the structures and ideologies with which we live produce blind selfishness and destructive attitudes. Decisions are taken to shape the future. Decisions (and non-decisions) are taken in social processes according to socially defined rules and perceptions. They are part of bargaining processes and power relations. The very definition of what is acknowledged to be a problem deserving decisions is deeply tied into the power structure of a given society. Although decisions seem to relate to problems, decisions reflect and reinforce power structures, and they reflect and define the perceived margins of possible action. Social units are part and dependent of others which provide for their opportunities and restrictions as, e.g., in the case of cities and national societies.

Everybody is at the same time actor and victim, and it would be of little help to individualize and personalize the problem. In a world which is increasingly controlled by anonymously owned corporations, the management must produce dividends and quotation profits, or it will be fired and exchanged. When the bank pays you a lousy interest rate of two or three per cent on your deposits while paying the teniold to holders of investment funds, you do not have much real choice: either you profit, or you pay for the profits of others. The ideology of supply-side economics promises that employment will increase when the profits increase, and it does so against all empirical reality where profits go to a large extent into currency or commodity

speculation and capital investment, thus the opposite of employment. We cannot praise the productive and allocative values of free competition and ignore that the real world economy is increasingly, and with public policy support, organized in huge monopolies and trusts. We shall not long be allowed to sing the song of individual human rights while, at the same time, depriving human beings from their life chances by unemployment, war, or environmental destruction. There can be no sustainability where ideology falls so far apart from reality. It is on us all to understand sustainability as a principle not only to organize our own everyday lifes but also to direct the decisions we make in elections, on the work-place, in our research and teaching.

Sustainability applies to both levels of society, the global and the local. This means that we have to face a problem of incredible complexity which is impossible to be understood in all its details and facets. There are three ways out of this dilemma:

(1) The first is proposed by the terrible simplificateurs; here, the solution lies in a simplified interpretation of reality and, consequently, simple recipes: the market will do, or the state, or the free entrepreneur, or the working class, or some New World Order no matter of whose grace. The result is ideology, and this is always in the interest of few at cost of many.

(2) The second is proposed by the scientific community (which often appears as a community only in the sense that it commonly exploits society); here, the solution proposed is that we essentially know nothing about reality which has not empirically been researched. For most members of this community, more precisely for its positivist fraction, there is not only no criterion to decide what is relevant and what is not, there is also neither social responsibility nor ought there be social control of scientific work - science is free of values, and the freedom of science is proclaimed absolute, without any restriction. This is, so they tell us, the very guarantee for every freedom in society. In many cases, this position does no harm to society and we need not care too much; in others, as in the debates on Waldsterben and acid rain, in the destruction of tropical rain forests or the pollution of the North Sea, it obviously does by preventing quick and determined action. Many of the problems we are facing today are outputs of socially blind, specialized scientific work as, e.g., in the case in the arms race, in high-tech medicine, in media manipulation, in overfertilization of soils, in nuclear energy. This, again, ends in ideology, i.e. the professional ideology of scientists which they use to defend their raison d'etre and their priviliges in society. As a matter of fact, some sciences seem to lend themselves quite readily to the production of ideology rather than to the production of useful knowledge.

(3) The third solution to complexity is proposed by common sense, but largely disturbed by the other two, and this is abstraction: The causes of many societal problems are well-known, and they are few. Real abstraction does not come about in obscure language but clearly and understandably points to the more important facts and allows us to pay less attention to those of minor importance. There are differences in the relevance of issues, there are differences in power, there are differences in the appropriation of resources and benefits, and all these are mutually interdependent. There is, at the bottom line, exploitation of non-human and human resources, and whatever efforts economists and others invest to disguise or justify this fact, we should not forget that this is one of the crucial variables in any research design on societal problems. Where people starve from hunger, there ought to be no undisturbed appreciation of music, agent orange ought not go well with caviar, and the squeezing to death if Iraqui soldiers in the desert sands does not go well with the proclaimed defense of human rights. This is, of course,

against traditional positivist epistemology which claims value-freedom and freedom of control for all the sciences. My point is that sustainability marks the end of value-freedom because sustainability is the precondition for the survival of mankind.

We live in a paradoxical situation: Communism has failed as a political force and, in consequence, as an ideology for the many, and capitalism seems stronger and more convincing than ever -- while, on the other hand, it never was so clear that todays' capitalism of the neo-liberal type is the greatest danger for survival. Economic growth is the golden calf of our days, even -- and more blindly accepted than in the West -- in the East, but economic growth, as we all know, has nothing to do with well-being. On the contrary: economic growth very often means ecological decline. Never has the search for alternative paths of development been so crucial. We do know that the Western pattern of consumerism cannot, and should not be allowed to, survive. At the same time, Western consumerism exacerbates in the West and provides the model for development in the East and the South.

The formerly socialist countries are, for better or for worse, in a unique situation. Their attempts towards economization, democratization, and decentralization produce, on the one hand, a climate of extreme uncertainty, of speculation, of naive hope for capitalism as trouble-shooter, of massive interference from outside, of non-routined ways. On the other hand, it is also a climate of opportunity, openness, and experimentalism. The summer seminar takes this as a challenge: How far can our (Western) past (and, according to the criterion of sustainability, widely negative) experiences allow us to learn lessons for the future? Which alternatives could be developed and tested in the new situation? How far should structural reform try to copy existing (e.g. Western, capitalist) experiences, and where are new and unencumbered possibilities to be sought?

The materials collected in this volume have in part been presented to and discussed at the summer seminar, in part are they products of reflection after the event. We have grouped them into three sections: (1) Basic Concepts, Orientations, (2) Transformation of Socialist Societies, (3) Applications.

The Summer Seminar produced a number of interesting results even beyond the discussions which changed the outlooks of many of the participants. There was, first, a number of questions defined which do need further clarification and might deserve deeper research:

(a) How can we detect models of socio-economic organization which allow the so-called most advanced societies to cut back their overproportional use of global resources to a measure which may be, in a global sense, sustainable? How can models be imagined which do no longer rest on the economic growth prerogative? How can such models be put into practice, brought into the political arena, and popularized?

(b) The relationship between ecology and democracy became more problematic than we expected in the beginning. Does an understanding of democracy based of the principle that the rich decide over their wealth and the poor over their poverty allow to make decisions which are ecologically necessary? Would a revised understanding of democracy which extends democratic principles into the work-place, the school, or into decisions on production be ecologically more or less sound from what we have today? How can citizen participation and ecological restructuring go together under conditions of poverty?

(c) Which practical possibilities exist to decompose the bundle of rights called property and to handle its different sticks separetely so as to come closer to democratic self-determination and ecological sustainability? Would the bundle of rights concept allow to exclude existential needs like food or housing from capital exploitation while preserving private property? How could we handle the property rights of future generations?

(d) How can problems like those just mentioned enter the curricula of public education of all levels? Would we need, in a conception of life-long learning, new definitions of general knowledge, or studium integrale, or transdisciplinarity, on which successive phases of professional specialization can build? Which elements must be dealt with in such a curriculum, and in which way?

Such questions more on the theoretical and research-oriented side were accompanied by practical proposals such as

(a) the establishment of a Local Innovation Newsletter, i.e. a source for disseminating all kinds of information on local experiments and innovations towards for around the world; UNESCO agreed in the meanwhile to study the feasibility of this project.

(b) The concept of Ecostations was discussed, which essentially means some easily accessible space in urban areas where information and advise can be obtained on ecologically sound construction, gardening, food, transportation etc. and where, in addition, citizen groups can meet for whatever purpose.

(c) The situation of the formerly socialist countries, despite the heavy pressure exerted from outside, might give room for certain experiments with property rights, e.g. in housing cooperatives and different forms of land-ownership, on different levels of the urban fabric, housing unit, neighborhood, residential section, municipality, urban agglomeration. Some possibilities for experiment have been discussed; only local ingenuity can assess what can be implemented in the real context.

Thus, the seminar was unexpetedly productive and stimulating and participants agreed that all attempts should be made to carry on this spirit to the next event. While this was the positive side of the evaluation, more efforts should be made in the future to ensure a more equal balance in participation between East, South, and West.

UNDERSTANDING SUSTAINABLE DEVELOPMENT

William E. Rees (1)

1. Purpose and Introduction

This chapter discusses major themes and perspectives in the ongoing debate over "sustainable development." My main purpose is to contribute a conceptual framework that will assist academic and professional planners to assess how emerging ideas in sustainable development should inform planning theory and practice in the decades ahead.

This task is not as simple as it sounds. Interpretations of sustainable development and its implications for planning vary as widely as the ideologies of its various proponents. However, rather than dwell on ideological differences per se, I focus on certain ecological realities that must be accommodated by any realistic approach to sustainable development. I also assume a global perspective on grounds that if the basic argument is correct, the success of sustainable development initiatives anywhere are dependent on sustainable development everywhere. With this in mind, the paper concludes with an assessment of current global directions.

The Ecological Framework

Some of the most substantive challenges to conventional thinking come from recent efforts to specify the limiting ecological conditions for sustainable development. Historically, the development debate in liberal democracies has been dominated by social and economic considerations. From this perspective, there are no absolutes - what constitutes sustainable development is largely a matter of subjective opinion and expressed public preference. Within a broadly utilitarian framework, pluralist society will ultimately arrive at a politically expedient interpretation of the concept through the usual power-brokering, negotiation, and compromise among competing interests and values. The acceptance of ecological constants obviously places unaccustomed boundaries on this debate.

This is not to deny that many dimensions of development remain subject to sociopolitical negotiation and control. For example, society might achieve sustainable development in ways that reduce economic disparities between the rich and poor, or in ways that exacerbate existing relative poverty (Boothroyd 1991). However, the point here is that the basic ecological requirements for sustainability are not negotiable. Industrial society is now constrained by biophysical realities which, if heeeded, provide objective criteria for sustainability. Satisfaction of these ecological criteria is a necessary if not sufficient condition for sustainable development whatever its political and socioeconomic character.

2. Defining Sustainable Development

The concept of sustainable development has deep roots in early 20th Century theory of renewable resource management. Later advanced as a more fully integrated approach to conservation and development in the World Conservation Stratety (IUCN 1980), sustainable development has only recently been popularized by Our Common Future, the 1987 report of the World Commission on Environment and Development (The Brundtland Commission).

The Brundland Commission defined sustainable development as "development that meets the needs of the present without compromising the ability of future generations to meet their own needs" (WCED 1987:43). This innocuously skeletal definition gave something to everyone, and academe, goverments, and non-goverment organizations have been striving ever since to flesh it out. As global ecological trends worsen, any concept that implies we can eat our development cake and have the environment too naturally inspires enthusiasm on all sides of the debate (2).

As noted, general concurrence on the need for sustainable development obscures equally widespread disagreement over the practical meaning of the concept. Environmentalists of all stripes and groups on the political left emphasize the "sustainable" part. They see a need to put Earth first, limit material growth, return to community values, and devise ways to share the world's wealth more equitably. Economic planners, the political center, and all those to the right warm more to the "development" component. From this perspective, there are no limits, growth comes first, the present system works, and the global expansion of market economies will create all the wealth needed for world ecological and social security.

While proponents of sustainable development occupy the entire political spectrum, the debate is becoming polarized around two distinctive worldviews each with its own normative assumptions and distinctive vision of humankind's role in the scheme of things. Milbrath (1989) labels these poles the "dominant social paradigm" and the "new environmental paradigm". Taylor (1991) calls them the "expansionist worldview" and the "ecological worldview."

The Dominant Worldview: Mainstream Perspectives on Sustainable Development

The Brundtland Commission was curiously ambiguous in elaborating on its definition of sustainable development. Our Common Future defines "needs" as the "essential needs of the world's poor, to which over-riding priority should be given." It also acknowledges the "limitations imposed by the state of technology and social organization on the environment's ability to meet [those needs]" (WCED 1987:43). To people concerned about ecology and social equity, such words seemed to be a plea for political recognition of global economic injustice and limits to material growth.

But there is another side to Our Common Future that guaranteed its message would be as enthusiastically received in corporate boardrooms everywhere. The report reassuringly asserts that "sustainable development is not a fixed state of harmony, but rather a process of change in which the exploitation of resources the orientation of technological development, and institutional change are made consistent with future as well as present needs" (WCED 1987:9). Achieving sustainable development is said to depend on broader participation in decision-making; new forms of multilateral cooperation; the extension and sharing of new technologies; increased international

investment; an expanded role for transnational corporations; the removal of "artificial barriers to commerce"; and expanded global trade.

In effect, the World Commission equated sustainable development with "more rapid economic growth in both industrial and developing countries" on grounds that "economic growth and diversification ...will help developing countries mitigate the strains on the rural environment,..", (WCED 1987:89). Consistent with this interpretation, the commission observed that "a five- to tenfold increase in world industrial output can be anticipated by the time world population stabilizes some time in the next century" (WCED 1987:213)(3). In recognition of the additional stress this implies for the environment, the commission cast sustainable development in terms of more material- and energy- efficient resource use, new ecologically benign technologies, and "a production system that respects the obligation to preserve the ecological base for development" (WCED 1987:65).

Orthodoxy Affirmed

Government response to the Brundtland Commission in the industrial democracies is perhaps typified by the report of the Canadian "National Task Force on Environment and Economy" (CCREM 1987). Taking its cue from Brundtland, the task force defined sustainable development as "development which ensures that the utilization of resources and the environment today does not damage prospects for their use by future generations." Ignoring the obvious difficulty posed by the consumption of non-renewable resources in any generation, the report goes on: "At the core of the concept... is the requirement that current practices should not diminish the possibility of maintaining or improving living standards in the future." Perhaps most revealing is the assertion that: "Sustainable economic development does not require the preservation of the current stock of natural resources or any particular mix of human, physical and natural assets (emphasis added). Nor does it put artificial limits on economic growth provided such growth is both economically and environmentally sustainable" (CCREM 1937:3). Certainly no one can accuse this task force of confusing sustainable development with any "fixed state of harmony!"

Can the Solution be Found in the Problem?

Both the Brundtland Commission and the Canadian task force reflect the prevailing interpretation of sustainable development in the political mainstream and on the right in industrialized countries. Governments and industry increasingly acknowledge that present development practices do produce significant environmental and socioeconomic stress. However, without pausing to examine its systemic roots, both reports assert that the solution to the global ecological crisis resides within the same socioeconomic structures that seem to have created it in the first place (4).

Even fans of Our Common Future who recognize its radical implications acknowledge that its authors "have turned out to be their own worst enemies - they failed to draw out the implications of their own statements" (Brooks 1990:24). More virulent critics argue that its analysis is "superficial or lacking". Because it fails to identify and analyze the causes of global poverty and ecological decline it advances solutions "that are the direct opposite of those required". By not

challenging the assumptions driving an increasingly market-driven global economy; by ignoring the connection between global ecological concerns and profligate lifestyles of the industrialized countries; by putting their faith in the "indiscriminant growth and trickle down approach to third world development" the Commissioners produced a thoroughly conventional statement. The Brundtland Report "constitutes an enthusiastic and unquestioning reaffirmation of the system, lifestyles, and values that are causing the problems under discussion" (quotations from Trainer 1990:72).

Most important, Our Common Future advances economic growth as the principal vehicle for sustainability in the apparent belief that eventually the poor will benefit and sufficient economic surpluses will be available for ecosystems maintenance. Tenuous assumptions aside, many analysts find this continuing reliance on growth to be the most troubling aspect of the mainstream prescription for sustainable development. The World Commission "reveals no acquaintance with any of the extensive literature now supporting [challenges] to the growth conception of development" (Trainer 1990:79). Indeed, the Commission's work was little influenced by science of any kind. Its mandate ensured that the Commission "was most concerned with values..." (Timberlake 1989:117). As a result, for all its pervasive influence, Our Common Future is a political document, not a scientific one. "The claim that we can have economic growth without damaging the environment is a sheer statement of opinion" (Timberlake 1989:122).

A Fixation on Growth

Perhaps the fixation on growth per se should come as no surprise. Our "...largely uncritical worship of... economic growth is as central to [capitalism's] nature as the similar veneration of ...divine kingship or doctrinal orthodoxy has been for other regimes" (Heilbroner 1989:102)(5). Indeed, some economists believe "not only in the possibility of continuous material growth, but in its axiomatic necessity" (Georgescu-Roegen 1977).

Nevertheless, given the "sustainability" theme, it is remarkable that neither the Brundtland Commission nor the Canadian Task Force distinguish between growth, which "should refer to quantitative expansion in the scale... of the economic system", and development which "should refer to the qualitative change in a physically nongrowing economic system in dynamic equilibrium with the environment" (Daly and Cobb 1989:71). By these definitions, sustainable growth in a finite environment is a logical impossibility but sustainable development contains no self-contradiction. This simple distinction between mere growth and true development is essential to rational debate on developing sustainability, but has scarcely entered the discussion!

There is an historical basis for this reticence. Economic growth has long been the principal instrument of social policy in capitalist societies. "If we can have perpetual growth, those who are relatively well off won't have to share their wealth with others" (Miernyk 1982:4). Thus, we refuse to fight poverty by redistribution and sharing... leaving 'economic' growth as the only acceptable cure..." (Daly 1990:118). The promise of an ever-increasing economic pie holds out hope that even the poor will eventually get an adequate share. This expectation reduces popular pressure for policies aimed at more equitable distribution of national incomes.

While morally bankrupt, this "solution" to social inequity posed no physical threat to society as long as the economy was small relative to the scale of the ecosphere. This is no longer the case, but in advancing growth-as-solution once again, our mainstream authors make no attempt to weigh the anticipated future scale of the global economy against the finite productive capacity of the ecosphere.

In fairness, we should note that conventional economic analysis cannot even pose the proper question. Macro-economic theory has nothing to say about the appropriate scale of the economy (Daly 1989,1990). The idea of continuous growth is so firmly entrenched that the issue of scale has apparently not been considered relevant. By contrast, from the ecological perspective, it is very much an open question whether it is possible to expand industrial production by a factor of five to ten while simultaneously guaranteeing "the sustainability of ecosystems upon which the global economy depends" (WCED 1987:67). How the world's dominant economic paradigm has drifted so far from what seems to be self-evident reality is the focus of the following section.

3. The Mechanical Economy

A given culture's "story" about reality provides "a context in which life [can] function in a meaningful manner" (Berry 1988:123) and profoundly affects how its members act in the world. The internal contradictions of our prevailing economic story can be traced to the 19th Century founders of the neoclassical school. Impressed with the successes of Newtonian physics, they set about to create economics as a sister science "the mechanics of utility and self-interest" (Jevons 1979, cited in Georgescu-Roegen 1975) .
The decision to develop a mechanical rather than biological metaphor for the economy was a critical one. While economics is (or should be) a branch of human ecology, the central assumptions of modern economic theory are uninformed by ecological principles. Three closely related assumptions of the mechanical model are sufficient to illustrate this historic divergence.

First, industrial society perceives the human enterprise as dominant over and essentially independent of nature. Indeed, we act as if the economy is somehow separate from the rest of material reality. The parallel notion of environment-as-separate-entity is therefore a social invention reflecting the Cartesian subject-object dualism at the heart of western scientific materialism (6). The very word becomes its own pejorative diffidently declaring itself to be peripheral, unimportant, not to be taken seriously (Rowe 1989). The economy may use "the environment" as a source of resources and sink for wastes (Herfindahl and Kneese 1974), but beyond that it is perceived as a mere static backdrop to human affairs.

Second, economists have adopted the circular flow of exchange value as the starting point for analysis rather than the one-way entropic throughput of energy and matter (Daly 1989:1). The major consequence is an entrenched view of economic process as "a self-sustaining circular flow between production and consumption..." By this perception, "everything... turns out to be just a pendulum movement... If events alter the supply and demand propensities, the economic world returns to its previous position as soon as these events fade out." Most important, "complete reversibility is the general rule, just as in mechanics" (Georgescu-Roegen 1975:348, emphasis added). Indeed, by inventing a perpetual motion machine economics seems to have done mechanics one better!

Third, we have come to believe that resources are more the product of human ingenuity than they are of nature. According to neoclassical theory, rising market prices for scarce materials encourage conservation on the one hand and stimulate technological substitution on the other. It is part of the conventional wisdom of many economic planners that these factors have indeed been more than sufficient to overcome emerging resource scarcities (Victor 1990:14).

While standard neoclassical texts conclude almost conservatively that "exhaustible resources do not pose a fundamental problem (Dasgupta and Heal, 1979:205), the most ardent (and influential) disciples of the substitutability principle are moved to idealistic, almost surreal, extremes (7). Gilder argues that we "must overcome the materialistic fantasy: the illusion that resources... are essentially things, which can run out, rather than products of the human will and imagination which in freedom are inexhaustible" (Gilder 1981:232, cited in Daly and Cobb 1989:109). Similarly, Simon (1982:207) remarks: "You see, in the end copper and oil come out of our minds. That's really where they are." So pervasive is this doctrine that Block (1990:304) uses it to argue for further population growth on grounds that people "create the wealth they need to maintain themselves and more, thanks to free markets and technological progress."

To summarize, economic theory necessarily contains a model of nature. The key assumptions of the contemporary model range from mechanical dualism on one extreme to metaphysical idealism on the other. Together they describe an economic system which, being functionally independent of physical reality has unlimited potential to expand. Add open access to resources (the so-called "common property" problem) and future discounting (particularly in the face of uncertainty) and we have a system in which there are often "no economic forces whatever acting in favor of sustainable development..." (Clark 1991).

4. The Economy in the Real World (8)

Given its material success in the industrial age, countries almost everywhere now find the neoclassical paradigm a more compelling guide to economic policy and behavior than is the biophysical reality from which it is abstracted. As with all models, its internal logic "heighten[s] the tendency to prize theory over fact and to reinterpret fact to fit theory" (Daly and Cobb 1989:38) (9). This section re-examines the internal logic of the model in light of ecological theory. My thesis is that the dominant economic paradigm is a fatally flawed. Its limited content and false assumptions are self-defeating in the quest for sustainable development.

Economics as Human Ecology

From the relative objectivity of scientific ecology, there is little to distinguish humankind functionally from the millions of other species with which we share the planet. Like other organisms, we survive and grow by extracting energy and material resources from the ecosystems of which we are a part. Like other species we "consume" these resources before returning them in altered form to the ecosphere. Thus, far from existing in splendid isolation, the human economy is and always has been an inextricably integrated, completely contained, and wholly dependent sub-set of the ecosphere.

While politicians and businessmen call for "environment-economy integration" as the solution to our environmental crisis, it is actually the present form of integration that is the cause of the problem. It follows that since we cannot separate the economy from the ecosphere, we must restructure the relationship to conform to ecological reality rather than to more comfortable but simplistic assumptions. Only in this way can economics finally become good human ecology.

The Second Law: Economy as Consumption

Contrary to conventional wisdom, the ecologically relevant flows through the material economy are not circular but unidirectional. This is because the ultimate regulator of the economy is not mechanics but thermodynamics. In particular, the Second Law (the entropy law) states that in every material transformation, available energy and matter are continuously and irreversibly degraded to the unavailable state (see Georgescu-Roegen 1975:1977). Economic activity requires both energy and matter and therefore necessarily contributes to a constant increase in global net entropy (disorder) through the continuous dissipation of waste heat and residuals (pollution) into the ecosphere (10).
Without reference to this entropic throughput "it is virtually impossible to relate the economy to the environment," yet the concept is "virtually absent from economics today" (Daly 1989:1).

In effect, thermodynamic law dictates that all material economic "production" is actually consumption. Herein lies the essence of our environmental crisis. Since our economies are growing and the ecosystems within which they are embedded are not, the consumption of resources everywhere has begun to exceed sustainable rates of biological production. Seen in this light, much of today's wealth is illusion derived from the irreversible conversion of productive natural capital into perishable human-made capital.

We now have the basis for a thermodynamic definition of sustainable development as development that minimizes the increase in net global entropy. (In theory, we could actually work with the ecosphere to reduce the entropy of the ecosphere.) By contrast, our present emphasis on material growth maximizes resource use and consumption, thereby maximizing entropy.

Obligate Dependency and the Ultimate Market Failure

Wishful thinking aside, humankind exists in a state of obligate dependency on many critical products and processes of nature. Resource depletion therefore remains a fundamental problem. While market mechanisms may be effective at setting prices and finding substitutes for valued nonrenewables such as copper or oil, they are an inadequate solution to the depletion of bioresources on several grounds:

1) price- or scarcity-induced substitution may occur too late to permit the recovery of renewable and replenishable resources that have been over-exploited;

2) substitution does nothing to repair the pollution damage caused by the dissipation of the by-products of previously depleted resources;

3) some renewable resources for which there are markets (e.g., agricultural products) are dependent on material or process resources (e.g., soils and soil-building processes) for which there are none; and,

4) other material (e.g., the ozone layer) and process resources (e.g., photosynthesis, climate stabilization) have not been recognized as economic resources at all.

These last two factors are particularly important. Markets are silent on the state of many ecologically critical materials and processes despite their immeasurable positive economic value. The primary scarcity indicator offered by the neoclassical school - pricing - fails utterly when the assumptions under which it operates do not prevail (Victor 1990). Traditional analysis can therefore lead to morally and ecologically indefensible tradeoffs and substitutions. Consumption and pollution destroy ecologically essential resources with no signal from the marketplace that the very basis of survival is being irreversibly eroded. And there are no technological substitutes.

These weaknesses in the neoclassical model illustrate a basic theorem of systems analysis and cybernetics. "We cannot regulate our interaction with any aspect of reality that our model of reality does not include because we cannot by definition be conscious of it" (Beer 1981:9) (11). In short, if critical dimensions of the global ecological crisis lie outside the parameters of existing economic models, conventional analyses have little to contribute to sustainable development.

5. The Ecological Basis for Reform Economics

The Bad News: Where We Stand

The five-fold increase in world economic activity since the Second World War has produced an increasingly integrated world economy whose scale now approaches that of the ecosphere itself. Existing data suggest that the present rate of economic throughput already exceeds the rate of ecospheric production in important ways. Encroaching deserts (6 million ha/year); deforestation (11 million ha/yr of tropical forests alone); acid precipitation and forest dieback (31 million ha damaged in Europe alone); soil oxidation and erosion (26 billion tonnes/yr in excess of formation); toxic contamination of food supplies; draw-down and pollution of water tables; species extinction (1000s/yr); fisheries exhaustion; ozone depletion (5% loss over North America [and probably globally] in the decade to 1990); greenhouse gas buildup (25% increase in atmospheric $C0^2$ alone); potential climatic change (1.5-4.5C° mean global warming expected by 2040); and rising sea-levels (1.2-2.2 m by 2100) and like trends are the result of either excess consumption or the thermodynamic dissipation of toxic by-products of economic activity into the ecosphere (Data from: Brown et al. [Annual]; Brown and Flavin 1988; Canada 1988; WCRP

1990; Schneider 1990; US Environmental Protection Agency [reported in Stevens 1991]). These trends carry the ultimate threat of irreversible ecological disruption and attendant geopolitical instability (12). Prevailing patterns of development are simply not sustainable.

The Good News: The Self-Producing Ecosphere

Fortunately, the ecosphere has the capacity to recover from abuse. Unlike economic systems, ecosystems are inherently self-sustaining, and contribute continuously to reducing global net entropy. The ecosphere therefore appears to defy the entropy law: "...[the system] is in many respects self-generating - its productivity and stability determined largely through its internal interactions" (Perry et al., 1989:230).

The organizational property which enables living systems to produce themselves is known as autopoiesis (Maturana and Varela 1988:43). Autopoiesis is a product of the complex, interdependent relationships (energy, material, and information flows) linking the system's major components. The structural integrity of these relationships is essential not only to the functioning of the system, but also for the production and maintenance of the participating components themselves. Human disruption of ecosystemic relationships on a global scale would severely compromise the possibility of achieving sustainable development.

Autopoeisis is possible only because the stuff of ecosystems is constantly being transformed and recycled, and because ecosystems, unlike economic systems, are able to access an external source of free energy, the sun. In thermodynamic terms, photosynthesis is the most important productive process on Earth and the ultimate source of all the biological capital (low entropy resources) upon which the human economy depends (13).

Since the flow of solar radiation is constant, steady, and reliable, production in the ecosphere is potentially sustainable over any time scale relevant to humankind. Nature's productivity is limited, however, by the availability of finite nutrients, photosynthetic efficiency, and ultimately the rate of energy input (the "solar flux") itself. Ecosystems therefore do not grow indefinitely (14). Unlike the economy which expands through dominant positive feedback they are held in a dynamic, far-from-equilibrium "steady-state'' by negative feedback.

Ecology's Bottom Line

The ecological bottom line for sustainable development should by now be apparent: humankind must learn to live on the "interest generated by remaining stocks of living "natural capital." Any human activity dependent on the consumptive use of ecological resources cannot be sustained indefinitely il it not only consumes annual production, but also cuts into capital stocks (Rees 1990a,b).

Recognition that bioresources can be treated as unique forms of productive capital is the major contribution to date of the emerging hybrid discipline of "ecological economics." This economic

metaphor even provides new light in which to view the persistently negative ecological trends noted above - the growing global economy may already have reached the point at which the marginal costs of natural capital depletion exceed the marginal benefits of jobs and commodity production. In these circumstances, further growth of the material economy is, in fact, "anti-economic growth" that ultimately "makes us poorer rather than richer" (Daly 1990:118). We explore the implications of these ideas for sustainable development in the following section.

6. Maintaining Natural Capital: A Necessary Condition for Sustainability

Sustainable development, as a goal, rejects policies and practices that support current living standards by depleting the productive base, including natural rcsources, and that leave future generations with poorer prospects and greater risks than our own (Repetto 1986:15).

There can be little doubt that our present reactive responses to global ecological deterioration compromise our own potential and [shift] the burden of environmental risks to future generations" (Pearce et al. 1989:19). Any proactive prescription for sustainable development must acknowledge the primary role of bioresources in human survival and the inequity inherent in current practice.

Maintenance of the functional integrity of the ecosphere is a necessary prerequisite to extending the time horizon for economic policy and to elevating both intra- and inter-generational equity to a place of prominence in developmental decision-making.

The developmental implications of this convergence of ecological and economic thinking are currently being explored through various interpretations of a "constant capital stock" criterion for sustainability (Daly 1909, Pezzey 1989, Costanza and Daly 1990, Pearce et al. 1989,199(). In essence, adherence to this criterion would require that each generation leave the next generation an undiminished stock of productive assets. There are two possible interpretations of the constant capital stock idea (adapted from Pearce et al. 1989) (15).

i) each generation should inherit an aggregate stock of manufactured and natural assets no less than the stock inherited by the previous generation. This corresponds to Daly's (1989) conditions for "weak sustainability";

ii) each generation should inherit a stock of natural assets alone no less than the stock of such assets inherited by the previous generation (16). This is a version of "strong sustainability" as defined by Daly (1989).

The first interpretation reflects the neoclassical assumption that humanmade and natural assets are substitutes and that biological assets (e.g., forests) can rationally be liquidated through "development" as long as subsequent investment in manufactured capital (e.g., machinery) provides an equivalent endowment to the next generation (17). Pezzey (1989:22) seems to lean towardsthis version noting that applying the principle "inevitably boils down to deciding how essential to and substitutable in production are the different components of capital: machines, technical know-how, renewable and non-renewable resources."

The second interpretation better reflects the ecological principles advanced above. In particular, maintaining natural capital stocks recognizes the multifunctionality of biological resources everywhere, "including their role as life support systems" (Pearce et al. 1990:7) In this respect, strong sustainability" recognizes that manufactured and natural capital "are really not substitutes but complements in most production functions" (Daly 1989:22).

The reliability of the ecosphere's life support function is positively correlated with high levels of species diversity and structural complexity. Maintaining biological diversity is therefore a primary goal of natural capital conservation. Diverse natural systems and dependent economic systems display greater resilience (resistance to shock or stress) than species-impoverished managed systems such as agricultural monocultures. More important still, robust ecosystems, unthreatened by irreversible species loss, are essential for autopoiesis. Sustainable development is impossible in a thermodynamically far-from-equilibrium world unless the ecosystems upon which humans depend are capable of continuous self-organization and production.

Pearce et al. (1990) observe that conserving natural capital may seem particularly relevant to developing countries in which socioeconomic stability is immediately and directly threatened by deforestation, desertification, soil erosion, falling water tables, etc. In these circumstances there can be little doubt that existing stocks of natural capital are well below bioeconomic optima and must actually be enhanced for survival let alone sustainability (18).

However, they also note that further reductions of natural capital may impose significant risks on society, even in countries where it might appear we can afford to [reduce stocks]" These risks reside in our imperfect knowledge of ecological functions, the fact that loss of such functions may be irreversible, and our inability to substitute for those functions once lost. In short, because of the unique and essential services provided by ecological capital, we cannot risk its depletion (19). "In the face of uncertainty and irreversibility, conserving what there is could be a sound risk-averse strategy" (Pearce et al. 1990:7).

We should note that "constant capital stock" could be interpreted to mean constant economic value which would allow for declining physical stocks with rising real prices over time. Alternately, it might mean constant price over time in situations where intensified exploration or technological substitution are able to compensate for increasing resource scarcity (Pearce et al. 1990:10). However, the forgoing analysis makes clear that the only ecologically meaningful interpretation for renewable resources is in terms of constant physical stock. The constant capital stock criterion therefore overturns the conventional wisdom that "sustainable economic development does not require the preservation of the current stock of natural resources or a particular mix of human, physical and natural assets" (CCREM 1987).

7. The Limits of Rational Analysis

The extension of benefit/cost and marginal analysis to ecosphere functions is a conceptually powerful step towardsrecognition and protection of ecological values. However, the practical reality is that we are not likely in the foreseeable future to be able adequately to quantify the "life support functions" of ecosystems, let alone ascribe a money value at the margin. Having

established a seemingly rational framework for "environment-economy integration," there is way to apply it with accuracy or precision. Economic analysis is presently incapable of specifying the optimal stock and appropriate mix of natural assets.

Of course, the possibility remains that inaccurate use would suffice. For example, Amazonian deforestation claimed some 50,000 km² in 1989 but clearing fell to 20,000 km² in 1990, greatly reducing carbon releases to the atmosphere and the region's contribution to global warming. Pearce (1991) estimates the resultant economic savings (in the form of damage avoided from sea level rise alone) at $1300 per hectare for a total of $3.9 billion for the 3 million hectares not cleared. He also conservatively estimates the existence value of the Amazon forest (the amount adults in the developed countries might be willing to pay simply to conserve the forest) at $3.2 billion per annum. These figures each approximate 20% of the annual economic output of Amazonia. It is conceivable that combined with other ecosystems benefits and option values the estimated total non-market value of the remaining forest would be adequate to preserve much of it intact (20). It would be in Brazil's interests to accept this sum "as compensation for foregone development benefits if it exceeds the value of those benefits" Pearce (1991:47).

In present circumstances, a much simpler approach might be more procedurally rational (see below). A "sound risk-averse strategy" would involve international agreement that, while technically unestimable, the life support (indirect use) values of critical stocks of natural capital are greater than any stock-depleting direct development values however large the latter might be. Given the enormous threat to global security associated with irreversible disruptions of the ecosphere, and the increasing probability of such events under prevailing development approaches, we are dealing with a category of "strong catastrophic risk." Such risks should, in the limit, not be undertaken at any price" (Collard 1988:80) (21).

Decision-makers disturbed by the sweeping uncertainties of economic analysis for sustainable development will hardly be comforted by recent developments in ecology. Unlike the smoothly varying equilibrium models of neoclassical economics, real-world ecosystems, as self-organizing systems characteristically exhibit unexpected non-linear behavior particularly when perturbed by exploitation (Holling 1986). Indeed, scientists now recognize that even simple deterministic systems with only a few variables can generate seemingly random behavior. It is characteristic of such "deterministic chaos" that "any effect no matter how small, quickly reaches macroscopic proportions" (Crutchfield et al. 1986:49). Since initial measurements are always uncertain, long-term predictions of dynamical systems behavior are intrinsically impossible (Crutchfield et al. 1986; May 1989; Davies 1990). Even near-perfect knowledge of the current state of a chaotically self-organizing system does not confer the ability to predict any future state.

These observations could hardly be more unsettling for current development and resource management models. The central assumptions of the "normal" predictive science upon which they are based simply do not obtain. Substantive rationality assumes perfect knowledge, and a substantively rational choice requires that the outcomes of alternative strategies be calculable. By contrast, adequate data - economic or ecologic - on nature's life support functions are not forthcoming, and even if they were, such data would not necessarily improve our capacity to enhance global ecological or geopolitical security. When it comes to managing the ecosphere for sustainability, it seems that the final product of the steady progress of science is a rational argument for decreased reliance on strictly scientific rationality.

It should be clear by now that planning for sustainable development will require procedurally rational approaches that enable "'reasonable men' [to] reach 'reasonable' conclusions in circumstance where they have no prospect of applying classical models..." (Simon 1978:14). The risks and uncertainties associated with global change require that economic and development planners "adapt not just the techniques they use, but possibly the whole way they think about their role and their profession" (Cartwright 1991:54).

8. Toward A Truly New Paradigm

Such thinking as this reinforces the views of those who believe that the mere extension of existing models cannot solve our problems. To them, industrial society is confronted with a deep cultural malaise whose resolution will require profound changes in traditional beliefs about our relationships to each other and about our place in the natural world. The failure of conventional analyses creates the psychological space necessary for serious contemplation of alternatives and for the emergence of a truly new development paradigm.

Fortunately, there is no shortage of "unscientific" (but otherwise rational) concepts relevant to sustainable development. Numerous authors have begun to articulate new worldviews and corresponding development principles that transcend the conventional emphasis on hard technology, material growth, and the marketplace as the wellspring of all social value. Their writings can be found in a literature ranging widely from appropriate technology through social ecology, ecofeminism, and community development, to bioregionalism and so-called "deep ecology." (See Gardner and Roseland [1989a,b] for an introduction to some of these).

Where they deal with sustainable development directly, most of these authors address one or more of the following substantive principles or objectives: the maintenance of ecological integrity; the achievement of social equity (within and between generations); the fulfillment of human needs (material and non-material); keeping options open; and support for self-determination (Jacobs, et al. 1987; Dorcey 1991). Gardner (1990) distills four additional process-oriented principles from the literature for planning purposes. Taken together, these principles lead to an emphasis on spiritual as well as political freedom, long-term ecological security ahead of short-term economic gain, cooperative social relationships, and community values.

Much current writing addresses only one or a few of the changes needed to preserve ecological integrity or enhance social equity. For example, focusing on the values required to achieve intra-generational equity, Boothroyd (1991) makes an eloquent plea for "compassionate" sustainable development. A common theme in the social ecology/ecology stream is rejection of egocentric individualism and with it the human domination of nature as the key to ecological security (Bookchin 1980). Indeed, ecofeminism treats the continuing domination of women and of nature as two reflections of the same behavioral pathology (Salleh 1984). The major related contribution from deep ecology is recognition that humans are organically inseparable from the non-human world and that "all organisms and entities in the ecosphere as parts of the integrated whole, are equal in intrinsic worth (Devall and Sessions 1985:67; Naess 1986)).

Because of its emphasis on the ecology of place, bioregionalism is worth a special note. This is a "teaching which helps people both to describe the bioregion where they live and then to live

within its natural capacity to support life on a sustainable basis by ecological laws (Aberley 1985:145). Bioregional concepts offer much to sustainable development from the sociopolitical perspective as well. For example, bioregionalists reat appropriate scale as the single critical and decisive determinant of all human constructs...' on grounds that:

The only way people will... behave in a responsible way is if they have been persuaded to see the problem concretely and to understand their own connections to it directly - and this can be done only on a limited [spatial] scale. It can be done where the forces of government and society are still recognizable, where relations with other people are still intimate, and where the effects of individual actions are visible... (Sale 1985:53-54).

Recently, a few authors such as Milbrath (1989), Daly and Cobb (1989), and Brown et al. (1990) have attempted comprehensive syntheses of sustainable development. Significantly, the latter two volumes accept the maintenance of natural capital as a prerequisite to sustainability. This should suffice to illustrate that even if extensions of traditional analyses are inadequate in themselves, they may well be essential in the transition to, or as components of, more radical interpretations of sustainable development.

This brief introduction to the new "ecological worldview" cannot do it justice. The point here is to emphasize that while the mainstream sees sustainable development in terms of marginal adjustments to the status quo, a true alternative is congealing around new values associated with spiritual development, harmony with nature, and mutual reciprocity. Disallowed in technical analysis, such unmeasurables have been relatively neglected in conventional approaches.

9. Conclusions: The (Im)Possibillity of Sustainable Development

"...it would appear we are poised on the horns of a difficult dilemma - unable to live with economic growth for reasons of ecological limitation, but unable to live without growth for fear of the social and political specter that might follow in its absence" (Sanders 1990:395).

To the modern mind, high on the rhetoric of global expansionism, the alternative literature seems politically naive and economically simplistic. However, alternative concepts are often more firmly rooted in the soil of real human and ecosystems behavior than is the dominant paradigm. This should be kept in mind as we contemplate the present prognosis for sustainable development.

This paper argues that serious analysis and interpretation of sustainable development raises it above mere technological adjustment and efforts to extend neoclassical economic analysis. Developing sustainability requires profound changes in existing power relationships, a reordering of cultural values, massive institutional reform, and reconsideration of the social role of economic growth. The problem is that "sustainability is not regarded seriously by those who really count, namely those at the top of political structures and those who control the flows of national and international capital" (O'Riordan 1899:39).

Ironically, the failure of present development approaches to increase self-reliance and economic security in much of the world actually increases resistance to change at the popular level. Despite the growing threat of ecological instability, peoples greater fear seems to be the sociopolitical

chaos that might accompany deliberate economic stagnation or contraction (22). In the absence of feasible alternatives, no country has voluntarily made the necessary institutional adjustments or abandoned the pursuit of growth as the preferred means to sustain "development."

Indeed, quite the opposite. With the triumph of capitalism and the collapse of industrial socialism, "neoclassical economics and market liberalism are riding the crest of near-universal acclaim and celebration" (Sanders 1990:400). Accordingly, the blueprint for an increasingly global economy is being drafted in terms of expanded world trade governed by the harsh logic of the marketplace. The accompanying rhetoric already resounds with the hollow ring of cliche. Nations everywhere are honing their competitive edges, the better to exploit whatever comparative advantage they might enjoy on the level playing field of the global free market. Meanwhile, social programs wither and the environment is in danger of being forgotten altogether.

The idea, of course, is to stimulate growth with that maximum of economic efficiency possible only in a deregulated market. The chief instrument with the potential to achieve this latter condition is the General Agreement on Tariffs and Trade (GATT) whose purpose is to liberalize trade by reducing import and export controls and by eliminating non-tariff trade barriers. "Environment" is not mentioned in the GATT. On the contrary, the terms of GATT largely reflect the profit-maximizing interests of transnational corporations in obtaining raw materials and resource commodities at the lowest possible prices and selling value-added products in the world's richest markets. In a free competitive environment this mitigates against any resource protection measures that would add to costs or reduce competition and virtually assures the continued liquidation of natural capital particularly in the developing world. With environment still considered a market externality, "trade agreements will often institutionalize principles that are at odds with, and at times antithetical to, the objectives that are being pursued through international environmental agreements" (Shrybman 1990:31; see also Bown 1990 and Morris 1990).

The world is clearly setting off with renewed vigor down an historically well-worn path confident that the economic future will resemble the past, only more so. However, if the thesis of this chapter is correct the customary path leads nowhere near sustainable development. Long before we achieve the five- to ten-fold expansion of industrial activity anticipated by the Brundtland Commission, humanity may find itself in a politically dangerous world of fouled waters, ravaged soils, and erratic climate where the life-giving sun has itself become a hazard to existence. One wonders if anything short of planetary destruction will convince the leaders of the industrialized world that our present social myth, however well sustained by the evidence to date, is little more than what Beer (1981) would call a collection of "shared illusions"?

In a variation of the common property problem, there is little incentive for even a committed nation to go it alone - the initial internal costs would be substantial and the potential benefits overwhelmed by the inaction of others. On the positive side (and contrary to some opinion) the cooperation af all 160 sovereign states would not necessarily be needed at the outset. While sustainable development is often seen as a Third World issue, it is the 25% of the world's population in the industrialized North who, by consuming 80-86% of the world's nonrenewable resources and up to 50% of food supplies (WCED 1987), create most of the problem. If the industrial minority would lead, the developing majority would have to follow. Unfortunately, as

the main beneficiaries both of material growth and the prevailing development model, the wealthy nations are often the least inclined to change their profligate ways (23).

Epilogue: A Cautionary Note for Planners

Clearly, the sociopolitical barriers to sustainable development are formidable and the prognosis, at least in the mainstream, is discouraging. However, if we are to have an ecologically habitable, economically viable, and politically secure world in the 21st Century the barriers must be overcome. Of all development professionals, planners with their multidisciplinary training and integrated perspective are the best placed to act as midwives to the emerging new paradigm. Ultimately, and despite current emphasis on deregulation, the need for positive governance and proactive planning can only escalate in an increasingly populous world demanding ever more of an increasingly unstable ecosphere. In the meantime, enormous effort must be placed on managing the global transition from a world dependent on growth to one secure in sufficiency.

There is an important proviso. In all this work planners will acquire maximum leverage by shifting the focus of their efforts from changing the environment to changing human minds and redesigning social institutions. This chapter suggests that we do not have an ecological crisis, the ecosphere has a human crisis. Our "story" about our place in the scheme of things has somehow gone awry in the industrial age. For sustainable development, therefore, the need is more for appropriate philosophy than for appropriate technology. If we tend to ourselves, nature will take care of itself.

Notes

1. Part of an earlier version of this paper also appears in Rees (1991).

2. Daly and Cobb 1989:75-76) suggest that the Brundtland Commission's vague definition of sustainable development may have been purposeful and politically astute. It guaranteed there would be serious debate of a full spectrum of possible interpretations. Similarly, Brooks (1990:24) notes that Our common Future is important "not so much for what it says, but for the reaction it has generated. It has had a galvanizing effect on international development at a crucial time."

3. While this may seem like an extraordinary rate of expansion, it implies an average annual growth rate in the vicinity of only 3.5-4.5% over the next 50 years. Growth in this range has already produced a five-fold increase in world economic output since the Second World War.

4. Taylor (1991) labels sustainable development a "menace in as much as it has been coopted... to perpetuate many of the worst aspects of the expansionist model under the masquerade of something new." Even popular commentators now condemn sustainable development as "dangerous words now being used... to mask the same old economic thinking that preaches unlimited consumption in the crusade to turn more land into glorified golf courses, deadly suburban ghettos, and leaking garbage holes (so-called landfill sites)" Nikiforuk (1990).

Nelson (1990) sees industry's enthusiasm for sustainable development as a dangerous "corporate takeover" and the accompanying green rhetoric as little more than public relations "ecobabble." In this vein, one participant in "Globe '90" (a major conference and trade show for the environment industry held in Vancouver in larch 1990) observed that sustainable development had apparently come down to "business-as-usual with a treatment plant."

5. Heilbroner notes elsewhere that growth through the reinvestment of profit is the unique essence of the capitalist system. As the "the life blood of capitalism", profit not only provides the "wherewithal for expansion" but also represents "the intangible structure of power, hierarchy, privilege, and belief that arise from the systems nature and that give rise to its logic" (Heilbroner 1985:76-77).

6. Descartes viewed the external material world "as a machine and nothing hut a machine. There was no purpose, life, or spirituality in matter" (Capra 1982:60). He even extended this mechanistic view to living organisms: '...I do not recognize any difference between the machines mades by craftsmen and the various bodies that nature alone composes' (Descartes cited in Capra 1982:61).

7. This reflects the Kantian argument that the human mind is not passive in its experience. It actively creates its own reality. "In fact, anything we can speal; of... is in some sensc a product of the human mind" (Daly and Cobb 1989:108).

8. Based on Rees 1990 a,b,c.

9. Daly and Cobb (1989) refer to this general problem as the "fallacy of misplaced concreteness" and provide several additional examples.

10. For example, a finished automobile represents only a fraction of the energy and material (typically 25 metric tons) that has been permanently dissipated as pollution in the manufacturing process. Similarly, modern energy-subsidied agriculture consumes up to 10 fossil calories for every calorie of food energy produced.

11. Alternatively, "...the regulation that the regulator can achieve is only as good as the model of reality that it contains" (Beer 1981:9).

12. The 1991 Persian Gulf war is a recent example. This war was very much rooted in defence of the profligately unsustainable oil-based lifestyles of western democracies. Had we adopted strong conservation measures and promoted more investment in ecologically benign solar technologies in the 1980s in response to rising energy prices and early warnings of atmospheric change in the 1970s, we would be facing an oil glut in the 1990s. This would have reduced not only the inter-regional dependencies that led to war but also the threat of global warming.

13. The human enterprise already appropriates about 40% of terrestrial photosynthetic activity (Vitousek et al. 1986). Note that in a finite ecosphere, significant expansion of human populations and the material economy can only increase this ratio at the expense of other species.

14. While production may be more or less continuous, biomass accumulation is limited and ultimately balanced by the decomposition of organic material (previous production). In a closed system, such recycling is essential to provide the material basis (e.g., nutrients) for current production.

15. Both interpretations assume that existing stocks are adequate. If populations are growing or material standards increasing, the stock of productive capital will have to be increased to satisfy the sustainability criterion.

16. "Natural assets encompasses not only material resources (e.g., petroleum. the ozone layer, forests, soils) but also process resources (e.g., waste assimilation, photosynthesis, soils formation). It also includes renewable as well as exhaustible resources. For ecological reasons, our primary interest is in maintaining physical stocks biological resources. (Note that the depletion of nonrenewables could be compensated for through investment in renewable assets).

17. "Equivalent endowment" would be defined in terms of monetary value, wealth generating potential, jobs, and similar economic criteria. (It is worth noting that humankind has regretably failed to achieve even the modest objectives of "weak sustainability" in much of the world).

18. In economic terms, the optimal stock is the theoretical point at which the marginal costs of further development exceed the marginal benefits.

19. For example, the present unaccounted economic value of the world's remaining forests in terms of climate regulation, the stabilization of water regimes, and as carbon sinks may well exceed their market value as wood fibre.

20. Critics are wary that the dollar valuation of nature's services implies acceptance of the prevailing paradigm and undermines non-economic arguments for conservation (see Ehrenfeld 1978). Pearce (1991:48) acknowledges the anthropocentric and utilitarian nature of this approach but denies that it undercuts other rationales. However, he does assert that "it may not be necessary to resort to moral arguments..." if economic arguments alone are sufficient to justify [conservation]."

21. If either of these approaches is adopted, we would still face the additional wicked problem of [finding] mechanisms for international transfers to compensate the developing world for foregoing legitimate development projects (Pearce 1991:49).

22. Ironically, it is the rampant individualism, the destruction of community, and the erosion of the social contract characteristic of growth-bound neoconservatism that feeds this fear.

23 For example, The United States, Canada, (Great Britain, Japan and the Soviet Union are prominant among industrial countries resisting firm targets for $C0^2$ emissions reductions.

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PROPERTY RIGHTS AS A TOOL FOR DESIRABLE DEVELOPMENT

Peter Marcuse

The argument of this paper is simple:

Property rights can be a very flexible instrument to affect many purposes: meeting basic human needs, distributing power democratically, achieving some desired level of equality, stimulating the accumulation of wealth, providing for sound city planning.

To use property rights well,

-property must be understood as a bundle of many different rights, of which "owning" is just one;

-different things (land, houses, factories, tools, consumer goods) can be "owned" in different ways;

-"ownership" may be by different entities (individuals, coops, non-profits, private businesses, the state);

-a systematic approach that "mixes and matches" different forms of property rights, as to different types of property, for different types of entities, must be used to achieve the best results.

The paper spells out this argument, and ends with a few examples of what a differentiated use of property rights might look like. The paper necessarily begins, however, with a somewhat theoretical examination of what "property" and "ownership" actually mean.

A. The legal definition of "ownership" is clear, if complex: it is a bundle of rights, each of which is a relationship between persons as to a thing, not a relation between a person and a thing.

Definitions are critical. What the forms of ownership and tenure imply can vary enormously within formal categories. The differences involve, in each case, different relations among people (1); it is a fundamental principle of jurisprudence that ownership is a set of relations among persons and institutions with regard to a thing, not, as is often assumed in ordinary conversation, a relationship between a person or institution and a thing.

The law of ownership is not a set of rules fixing what I may or may not do to a thing but a set of rules fixing what other people may or may not prevent me from doing to the thing, and what I may or may not prevent them from doing to the thing (2).

Such a definition of ownership is consistent both with traditional Western jurisprudence and Marxist theory.

The analysis of ownership and the various tenure forms must then begin with a specification of exactly what relations among what persons each tenure form implies. This is the "bundle of rights" concept, well accepted at least in Anglo-Saxon law: that ownership or any other form of tenure is a collection of separate rights, and that each form of tenure can be defined by a specification of what rights it includes. I use the phrase "incidents of ownership" to cover those sticks in the bundle of rights that are most often associated with the"ownership" of a housing unit.

To help look at what kinds of rights, and by and against whom, are involved, I believe the most helpful as well as most rigorous approach is that developed by Professor Hohfeld (3), largely followed in the standard legal discussion in the United States (4), who distinguishes among the benefits of ownership: rights, privileges, powers, and immunities, and among the obligations or limitations on ownership: duties, "no-rights," liabilities, and disabilities. The detailed schema is too complex for a brief discussion, but the important point about it is that it is symmetrical: for every right by one person there is a duty by another, for every privilege on one person's part another person has "no-right," for every power one has another has a liability.

B. Many different "sticks" make up the bundle of rights that is ownership; ten or so of these "sticks" make up the basic incidents of ownership of housing.

Those characteristics that must be taken into account in trying to understand what form of tenure is desired, or what the consequences of a particular change in legal forms of ownership will be, include the following, which I would consider the key incidents of ownership (5):

- Privilege to occupy and have shelter

- Privilege of broader uses, privilege not to have use restricted

- Security, privilege of continued occupancy; immunity from eviction, right to protection in occupancy

- Privilege of privacy, not to have other invade unit, right to exclude others (6)

- Privilege to modify, make physical changes to the unit, Disposition

- Rights to residential services, utilities

- Privilege of transfer, as gift or inheritance (without profit), immunity from restrictions on disposition

- Privilege of transfer, as sale or rental (with profit), immunity from restrictions on disposition

- Duty of maintenance and repairs

- Right to public subsidy or support, immunity from payments to the state.

In addition, ancillary rights often are established for ownership, ranging from the right to vote to the receipt of various kinds of public benefits, subsidies, etc.

Obviously various combinations of these rights, privileges, powers, and immunities are possible; the extent to which each exists, who may have each, against whom, and as to what, makes up the range of possibilities that can be considered in defining a system of property rights. So let us look, next, as to why it might be logical to treat different forms of property differently, and then as to why it may make sense to treat different "owners" differently as to those forms.

C. Many different kinds of things may be "owned"; it makes sense to treat the "ownership" of some different kinds of things differently, for instance, agricultural land differently from urban, housing differently from stores or factories, consumer goods differently from producer goods.

All objects of ownership are not the same (7). Ownership of different kinds of property must be clearly distinguished from each other; a huge amount of mischief has been created by taking categories of ownership appropriate, for instance, to land, and applying them to housing units, or forms appropriate for consumption goods and applying them to machinery and tools for production. I believe very different concepts of ownership need to be distinguished (ordeveloped, to the extent existing forms are inadequate), as they apply to:

Agricultural land. This is the oldest form of private property, going back in uninterrupted lineage to feudal systems (8). The revolt against the feudal land ownership system was a necessary part of the transition to capitalism. In political development, the establishment of an independent yeomanry in England, the tradition of independent farmers and settlers in the United States, the failures to provide for individual farmer's land ownership in Russia (and in the South of the United States), the compromises preserving aristocratic land ownership in Prussia and much of the Austro-Hungarian empire, all were critical elements in determining the political as well as economic course of those countries into the twentieth century.

By the same token, the misunderstanding (sometimes deliberate and certainly often self-serving) of this evolution, in which home ownership by city residents is equated with land ownership by independent working farmers, has plagued discussion of "tenure forms" for at least 100 years. It makes nonsense of such rhetoric as that of the president of the National Association of Real Estate Boards, for instance, when he says:

"[The] far-seeing founders of our Republic...[visualized] a race of free men, made independent by individual ownership of the land. Life has indeed grown more intricate... but never has arisen any sound reason to question the ideal that goes to the heart of our economic existence--widespread home ownership... (9)".

The easy substitution of "home ownership" for "land" conceals a fundamental historical shift: in the 18th century, individual ownership of land meant individual ownership by the farmer of his basic means of production, while today home ownership is an exclusively residential concept having nothing to do with production at all (10).

Natural resources. Land is indeed only one of many natural resources, and the rules related to land might well be applied, by a parallel logic, to all natural resources.

Urban land. The rules of law applied to agricultural land have been taken over to apply to urban land in all capitalist countries, and, surprisingly, in many socialist countries as well (11). Yet the logic is entirely different, the interests affected are different, the economic result is different. For productive activity, the rent paid a landowner is a redistribution of value from producer to landowner, considered by many orthodox free market economists to be a parasitic drain on productive capital. Market prices for land as a method of allocating land among alternate uses and users plays an important role in city development in capitalist countries; it is however nowhere allowed free play in the planning of cities. A much more differentiated treatment of urban land would benefit cities in Western as well as Eastern countries.

Residential land may also logically be treated differently from land used for business purposes; or land used for single-family, owner-occupied housing differently from multi-family housing, which might be considered more similar to a business use, since "ownership" and use would be separate. Issues of residential land are involved in the treatment of housing, discussed below.

Means of production. (12) Ownership here has traditionally meant, for Marxists, the right to extract surplus value from the labor of employees; the craftsman or craftwoman's tools are (sometimes with elaborate intellectual gymnastics) differentiated from the capitalist's machines. In capitalist countries, the costs of acquisition and the possibilities of financing are intimately connected with legal forms of ownership, and very sophisticated forms of leasing and pledging have developed to integrate ownership forms into a functioning economic system.

Consumption goods. In developed capitalist systems, ownership here is again indistinguishable from ownership of other forms of property (13). In most of the Eastern European countries, following both the orthodox interpretations of Marxist theory and the example of the Soviet Union, "personal property," essentially goods for individual use and consumption, are the only kinds of private property allowed; their protection is generally, as in the former G.D.R., provided for in the Constitution itself.

Housing. Housing is both a particular form of a consumer good, a particularly large and expensive result of productive enterprise for others, and, particularly in its connection with land, a source of rent for sunk investment or for land owned. Because it differs from other "personal property" in these respects, specific rules have been developed in the countries of real existing socialism to deal with the "non-use" aspects of housing: prohibitions on private resale, for instance, or limitations on rent that may be privately charged, or public responsibility for production. Within the category housing, differences may also be made:

- Single-family housing is obviously the most easily adapted to purely individual ownership and responsibility;

- Multi-family housing, on the other hand, almost always needs some form of collective maintenance and mechanisms of collective decisions about the use of common spaces, etc., the kinds of decisions cooperatives facilitate.

Within multi-family housing, differentiations may be made by size. Yugoslavia, for instance, nationalized all buildings containing more than 2 units (14); rent control in New York City covers all buildings with 6 or more units; etc.

Public goods. Goods which either cannot be limited in their use (clean air), or as to which society as a whole benefits the more they are used (education), or the use of which is considered a fundamental right (health care) might also be considered a separate category of property, as to which public/state ownership is the only appropriate ownership form. It is so considered in most societies today, although the range of things or services as to which the concept applies (housing?) varies substantially from country to country.

Quite different forms of property rights can be provided for for each one of these categories, and perhaps others; there is no reason why the same set of rules has to apply to all of them, and in fact in most countries important differences are recognized by law among them (15).

D. There are many different kinds of "owners": individuals, corporations, cooperatives, non-profits, government. They can have very different kinds of tenure as to housing; "owning" and "renting" are just two of the possibilities, and they mean different things as to different "owners."

In many current discussions, it is assumed that there are only three, or possibly four, forms of "tenure:" public ownership, private ownership, private rental, non-profit ownership. Such usage implies that "ownership" is a single and indivisible concept and that the distinction among tenures is a distinction based on who "owns" a given unit of housing: in private rental housing, a private person/entity other than its occupant "owns" the unit, in owner-occupancy the occupant is the "owner," in public rental housing the state is the "owner," in social or not-profit housing the "owner" is a social or non-profit entity. A focus on who has what incidents of ownership would be much more fruitful: a "tenant" of a unit "owned" by a non-profit, who cannot be evicted and whose family has the right to continue occupancy after his/her death, is more similar to the "owner" of a single-family house with restrictions on resale that to the "tenant" of a private landlord in an unregulated housing market.

The forms of "tenure" can be listed by name, but the content of each will vary widely by economic system, historic tradition, constitution and statute, and judicial interpretation. As to a single piece of property, different tenures in the hands of different persons can also exist, separated by time, e.g. a unit can be publicly-owned for 15 years, then revert to private ownership, etc.

- Individual ownership of detached single-family units;

- Individual ownership of apartment units for the owners own use, in multi-family buildings (called condominium ownership in United States law), with collective control of common areas.

- Cooperative ownership, within which many variations can be distinguished, the major line of difference being:

- cooperative private ownership, in which the individual's right of ownership can be sold privately for an unrestricted profit; and

- non-profit cooperative ownership (or limited equity cooperative ownership), in which the right to sell for a profit is limited or non-existent.

- Non-profit organizational ownership, within which many variations can be distinguished, the major lines of difference being:

- publicly-owned (national, state, or municipal) corporations, or those a majority of whose directors are publicly appointed;

- charitable organizations;

- employer-established or controlled organizations;

- limited profit organizations, or organizations whose housing is non-profit only for a limited period of time, or whose dynamics otherwise are similar to those of profit organizations (e.g. high salaries for executives, speculation, etc.)

- direct public ownership, by a branch of local, state, or national government;

- private ownership for use by others than the owner, i.e. of rental units.

- collective, "social," "socialist," "people's" ownership, a category inherently antithetical to traditional capitalist concepts of ownership, whose closest analogy in Western law, judging from the experience of the German Democratic Republic in trying to reconcile ownership rights in Volkseigene Betriebe (people's own enterprises) with the legal system of the Federal Republic of Germany was the creation of a public trusteeship to take title of such enterprises, converting it essentially into state ownership. The concept was never satisfactorily developed in Eastern European societies either, however; Gorbachow, for instance, spoke of property in socialist ownership as being considered by many as being without any owner at all, and thus, by implication, available for exploitation by anyone so inclined (16).

Housing "classes," defined by "tenure," i.e. owners as one class and renters as the other class, seems a very clumsy approach to analysis indeed, in this context. Leaving aside the question of whether classes are better defined by production or consumption cleavages, to the extent that consumption cleavages are invoked and housing consumption is made central, that consumption needs to be defined much more carefully than a simple "ownership-rental" duality does.
As Alan Murie says, "The discussion about the interests generated by ownership refer to a set of historically specific circumstances rather than necessary attributes of the tenure" (17).

E. Different rights with relation to property, as to different types of property, for different persons, can be worked out; different rights, types of property, and persons, can be mixed and matched. A systematic and imaginative approach to property rights can serve a wide range of public policies very well.

The range of alternatives that could be considered for ownership forms should systematically consider variations by:

a. What the present form of "ownership" of the property is- how are the various incidents of ownership, the rights, powers, privileges, and immunities, as to the property, divided up;

b. What kind of property it is - land, housing, in production, etc.;

c. Who it is that now "owns" the property - who has each incident of ownership, paying particular attention to who has the ability to use it, and who has the ability to make decisions affecting its future use; and

d. Who it is that it is desired to "own" the property--who should be able to exercise each of the incidents of ownership connected with the property, paying particular attention (for housing) to who should be able to occupy it, who should have the right to profit from changes in its value, and who should have the right to make decisions as to its future occupancy.

As an example, and for purposes of discussion only, it might be sensible to differentiate between land and buildings, as different types of property. It might be desirable to give all rights of use to the present occupants of the housing unit within the building, and the land used in connection with it, and for life. The right to dispose of the unit could rest with the muncipality, with the exception of a right to dispose, for life use only, to the immediate family of the current occupant. The right to dispose of the land might belong to the municipality, but subject to the power in the occupant to require alternate residential accommodations. Distinctions might be made by who the owner is, and how large the unit is, with those having exceptionally desirable units as a result of a priviliged position having fewer rights of continued occupancy than others. Obligations to maintain and repair might be placed either with a municipality or with a non-profit or resident-controlled entity. Duties to pay the costs of maintainance might be imposed on the occupant and/or the municipality, and might vary with who the occupant is, what type of household, what income, etc. Land not used in connection with housing and suitable for commercial and/or industrial use might be allocated to a trusteeship-type entity, for disposition at market prices in accordance with municipally-exercised privileges to determine permissible uses in accordance with a community plan. And so on.

As a concrete example of how a systematic "mix-and-match" approach might be used to further public goals of urban development, consider the following possibilities:

Central city commercial land might be rented out only, not sold, with title held by the municipality, with provisions regulating use included in the lease-for instance, jobs provided, environmental conditions. Only end users might be permitted to lease land; or, if a speculative builder is allowed to build, the duration and extent of the speculation allowed could be limited. Rights to assign leases could be severely curtailed, and require municipal permission. Financing might be provided by the municipality, and assignments to guarantee repayment if there is borrowing from private sources might be permitted of the right to collect rents. Rental payments to the municipality, perhaps based on a percentage of rents received by the primary tenant or of appraised value, could take the place of real estate taxes.
Single-family residential uses could permit life-long use secured to the occupant, with a payment based on some combination of value and income; thus for an established minimum quality of housing, no one might be required to pay more then 20% of income, with payments going up as

quality, space, and/or income rise, or family size goes down. Personal preferences could be expressed by permitting "bids" for occupancy based on payment of varying percentages of income. Assignment, by gift or inheritance, could be a guaranteed right of the occupant, but only to family members. Other assignment, i.e. sale to a third party, could be permitted, so as to recapture any investments in purchase or improvements, but without profit, and with priority to buyers certified from a priority list publicly established based on need.

Multi-family housing could be held primarily by cooperatives, mutual housing associations, or community land trusts, forms in which collective "ownership" would be exercised by the democratic collectivity of those living in a building or buildings. Within that framework, rights and duties similar to those of single-family housing occupants (see above) could be provided.

Large new residential developments could be transfered to democratic assemblies of their residents, including control over any commercial facilities or public space located within it. Property rights could be a way of guaranteeing neighborhood self-government. The over-riding concerns of public policy, such as prohibitions against racial or ethnic discrimination, or maintenance of environmental standards, could be provided by law, as could equitable payment for supra-neighborhood services among neighborhoods.

These suggestions are only intended to be examples of what might be done through a flexible use of property rights; they are not detailed prescriptions recommended for immediate implementation anywhere. They should simply indicate the range of the possibilities. Other variations on property rights could also be imagined. Again, as examples, one could imagine:

(1). Different permissable legal forms of private contracts for ownership and use of property;

(2). Mechanisms for public (generally judicial) enforcement to different degrees or in different ways of private, personal, and public rights.

(3). Taxation of various forms of property, and taxation of various forms of interest in (ownership of) property, varying by owner and use;

(4). Protections of (and limitations on) rights of personal use of property, including regulation of eviction;

(5). Different subsidies for different forms of uses;

(6). Provisions for governmental, generally local, control of land uses in urban areas, including planning and zoning mechanisms;

(7). Environmental regulations;

(8). Provisions for taking by eminent domain, with procedures, payment, and permissable purposes varying by type of property and type of owner and use.
(9). Provision for public decision-making regarding changes in any of the above.

Again, these are simply illustrative possibilities.

Property rights, imaginatively defined and implemented, could thus provide an effective and flexible means of achieving a wide range of public policy goals. Accepting a conventional and restricted view of property rights, as being simply permitting unlimited private possession of all of the bundle of rights that "ownership" often is taken to mean, is throwing away a major tool for the governance of society according to the goals and desires of its members.

Notes

1. I use "people" and "persons" here to include any type of legal entity, whether individual, corporate, governmental, or otherwise; see discussion below of the variety of entities that may be involved in "ownership."

2. Turner, J. W. Cecil, 1941. "Some Reflections on Ownershipin English Law," XIX Canadian Bar Review, May.

3. Hohfeld, Wesley Newecomb, 1966. Fundamental Legal Conceptions as Applied in Judicial Reasoning. New Haven, Yale University Press (first published 1916).

4. Restatement of the Law of Property, 1936. Adopted and promulgated by the American Law Institute, St. Paul, American Law Institute Publishers, May.

5. A fuller elaboration may be found in: Marcuse, Peter. 1972. "The Legal Attributes of Home Ownership." Washington, D. C., The Urban Institute, April, Working Paper #209-1-1.

6. See Confusion #1 below.

7. For an earlier and more detailed discussion, see Marcuse, Property Rights, typescript.

8. The Roman system of property law was substantially more advanced than its feudal replacement in Europe, but it remained a curiously alien system to at least the Anglo-Saxon evolution to this day.

9. Quoted in Dean, Home Ownership: Is it Sound?, p. 3, and de Neufville and Barton, p. 5.

10. For a further discussion, and in particular a comment on how the concept "tenant" and the "renters' revolts" in early New York history, different from what similar terms would suggest today, see Marcuse, review of Allan Heskin, Tenants and the American Dream: Ideology and the Tenant Movement, New York, Praeger.

11. Agricultural land has indeed been specially treated, in some statutes, e.g. for the preservation of agriculture and the restriction of urban development, but always as modification of a single system of rules governing all land. On the other hand, in Yugoslavia, urban land was nationalized in 1958, rural land not. Simmie, p. 173.

12. The distinction between ownership of the means of production and ownership of consumption goods goes back to the fundamental works of Marx and Engels; see Anti-Dühring, in Marx-Engels Werke, vol. 20, pp. 122-3.

13. Particular rights and immunities attach to particular forms of personal property, e.g. in the United States exemption from certain forms of taxation, immunity from attachment under Homestead laws, etc., but these are again exceptions to an underlying uniformity of treatment, not a different category of ownership.

14. Simmie, James, 1991. "Housing and Inequality under State Socialism: An Analysis of Yugoslavia." Housing Studies, vol. 6, No. 3, July, p. 173.

15. In the United States, a "homestead exemption" exempts owner- occupied housing and individually used tools from attachment by creditors, for instance; residential land is taxed differently than commercial; agricultural land often may not be built upon; environmental restrictions cover much use of natural resources; etc.

16. Speech at the Plenum of the Central Committee of the C.P.S.U., Moscow, January 28, 1987; cited in Brie, p. 10.

17. Murie, Alan, "Social Differentiation in Urban Areas: Housing or Occupational Class at Work?" in Tijdschrift voor Econ. en Soc. Geografie 77 (1986), No. 5, pp. 345-357

THE FUTURE OF MEGA-CITIES: PLANNING IMPLICATIONS FOR A MORE SUSTAINABLE DEVELOPMENT

Salah El-Shakhs

It has increasingly become clear that one of the major consequences of the processes of development, modernization, and integration of spatial, economic, and political systems has been an inevitable tendency towardsincreasing structural imbalances within settlement systems during the early stages of development (Friedmann 1973; Mera 1978; El-Shakhs 1972-1982). Among such imbalances are development disparities and inequities:

a) between rural and urban areas,
b) among cities within urban systems and
c) between regions within the same country.

Thus the process of spatial polarization of development and the relative overconcentration of population, economic activities, and political power in one or a few core regions -- indeed in one or a few primate cities -- during the early stages of development became an important issue of public policy and a focus of explicit development strategies (Richardson 1977, Renaud 1981). Most developing countries perceived the spatial distribution of their population, and the resulting primate city patterns, as unacceptable and many governments have attempted to change such patterns through indirect national policies or explicit spatial development strategies. Such interest resulted from two major concerns: first, the potential impacts of unbalanced growth on the development and stability of the total system and second, the implications of the unprecedented growth of mega cities for their own functional performance, manageability, planning, and sustainable development.

It is not surprising that mega cities frequently receive a disproportionate share of government attention and planning activities. It is not clear, however, that such planning activities take full account of the uncertainties and dynamics of the long-range process of concentration/deconcentration within urban settlement systems. This paper is intended to focus attention on some aspects of this process and their general implications for the long range planning of mega cities, with a view towards creating more sustainable systems.

1. Mega City Growth Patterns

Indeed the thought that the Third World's Mega Cities can be expected to grow, given current projections (Table 1), to well over twenty million in population (Sao Paulo), or in excess of twenty five million (Mexico City) became a nightmare to both policy makers and planners. The World's large cities (those with one million population and over) as a group are currently expected to increase their share of the urban population from 36% in 1980 to 43% by the year 2000. In the Less Developed Countries, their shares are 33% and 45% respectively. In terms of absolute numbers (Table 2), the large cities of the LDCs are expected to house a population, by

the year 2000, which is roughly equivalent to these countries total 1980 urban population (0.96 compared to 1.01 billion), and more than the 1980 combined total urban population of the More Developed Countries (0.80 billion). Among this group, Mega-Cities (those with 7 million or more population) are expected to show the greatest growth by the year 2000 (218% increase compared to 174% for large cities as a whole).

Whether such projections will in fact materialize is subject to question. The fact remains, however, that Mega-Cities in the LDCs will likely grow rapidly in the foreseeable future. It is equally clear that the pressures, demands, and challenges facing urban governments and planners, particularly in Mega-Cities, and their capacity to respond to them are, in large part, determined by national and international forces beyond their scope or influence.

Recognizing such unique relationships, many national governments directly took charge of the planning and management of Mega-Cities. Their efforts focused primarily on counter-primacy measures aimed at restricting or slowing down the growth of primate cities. These range from "closed city" programs and direct controls of population movement to redistribution strategies aimed at changing inter-regional development patterns. The success of such attempts during early stages of development have at best been very limited, and at worst produced results opposite to those intended particularly in market and mixed economies (Findley, 1977; Stöhr and Tödtling, 1978; Renaud, 1981). The reasons for such disappointing experiences seem to lie in the fact that they went against the grain of powerful national polarization processes and were subverted by the impacts of counter policies and national integration efforts (El-Shakhs, 1982).

Recent evidence indicates, however, that while most LDCs still have to cope with urban explosion, particularly in their Super-Cities, many developed countries are already witnessing either relative or absolute decline in the population of their core regions (Vining and Kontuly, 1978). Such trends are no longer unique to the United States. The process of deconcentration within urban systems has been observed in such countries as Germany, Italy, Japan, and even in France, which has long been held as an example of unrelenting concentration. In fact the Paris metropolitan area is estimated to have lost over 300,000 people between 1968 and 1975 (OCED, 1979). Within Metropolitan areas, central cities had experienced such trends of reversal or decline much earlier and to a greater degree. At least five central cities (Philadelphia, Chicago, Detroit, Paris, and London) lost population in the 1960s, and three (New York, Los Angeles and Tokyo) in the 1970s.

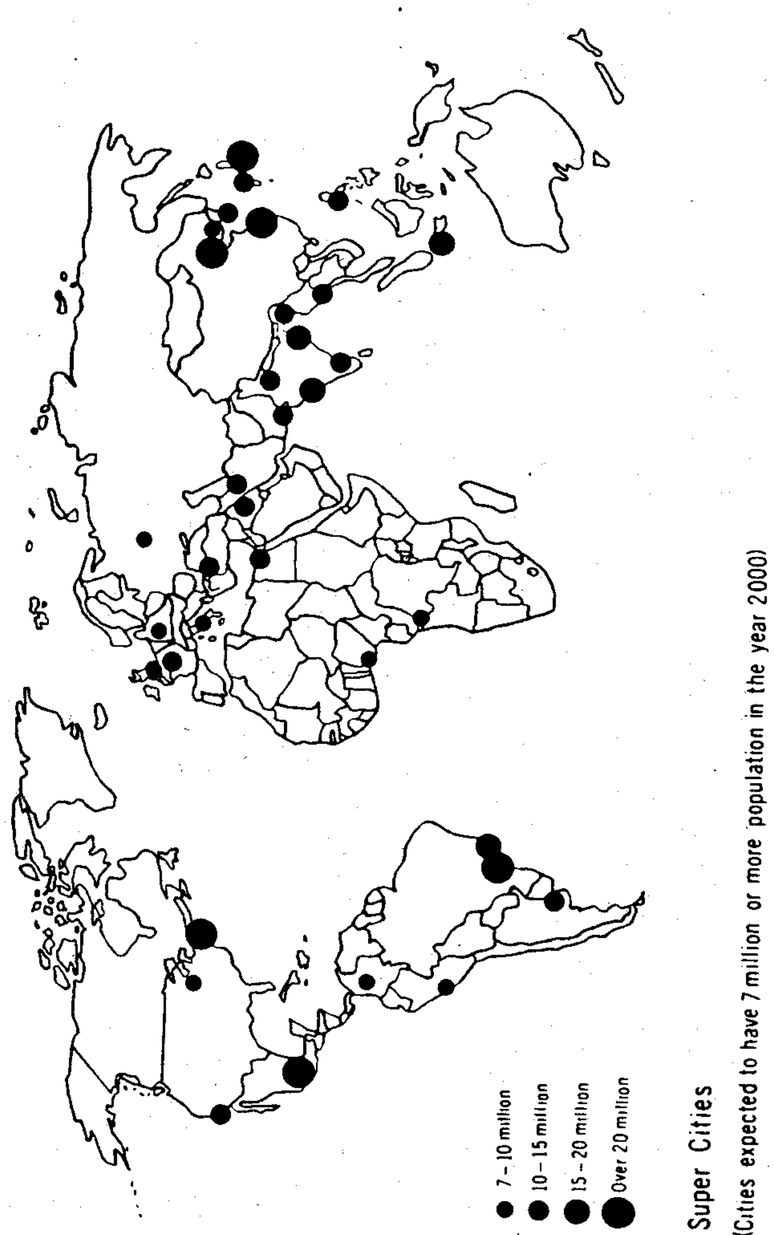
TABLE I:
The World's 35 Largest Mega-Cities in 2000
Their Growth and Share of National Urban Populations
1985 - 2000

Mega-Cities by Rank in the year 2000	1985 Population (million)	1985 % to National U. Pop.	2000 Population (million)	2000 % to National U. Pop.	% Growth 1985-2000
Mexico City	18.1	31	26.3	26	45
Sao Paulo	15.9	16	24.0	15	51
Tokyo/Yokohama	17.2	18	17.1	15	-0.6
Calcutta	11.0	6	16.6	5	51
Greater Bombay	10.1	5	16.0	6	58
New York/NE NJ	5.3	9	15.5	7	1
Seoul	10.2	41	13.5	37	32
Shanghai	11.8	4	13.5	3	14
Rio de Janeiro	10.4	10	13.3	8	28
Delhi	6.6	4	13.3	4	102
Greater Buenos Aires	10.9	45	13.2	8	21
Greater Cairo	8.5	38	13.2	36	55
Jakarta	7.9	21	12.8	18	62
Baghad	6.6	56	12.8	63	85
Tehran	6.7	28	12.7	30	90
Karachi	6.2	21	12.2	21	97
Istanbul	6.6	25	11.9	27	80

Sources: United Nations (1985), Estimates and Protections of Urban, Rural and City Populations, 1950-2025: the 1982 Assessment; perhaps calculated by author from this and other U.N. documents.

TABLE I CONTINUED

Mega-Cities by Rank in the year 2000	1985 Population (million)	1985 % to National U. Pop.	2000 Population (million)	2000 % to National U. Pop.	% Growth 1985-2000
Los Angeles/ L. Beach	10.0	6	11.2	5	12
Dhaka	4.3	31	11.2	33	160
Manila	6.8	30	11.1	27	63
Beijing	8.7	4.6	10.1	4.2	16
Moscow	8.7	4.6	10.1	4.2	16
Bangkok	5.5	65	9.5	54	73
Tianjin	7.8	2.7	9.2	2	18
Paris	8.9	20	9.2	18.8	3.3
Lima/Callo	5.7	39	9.1	39	60
London	9.8	19	9.1	17	-7.1
Kinshasa	4.3	30	8.9	34	107
Rhein-Ruhr	9.2	18	8.6	16	-6.5
Lagos	5.2	2.8	8.2	2.3	130
Madras	4.0	2.2	8.0	2.2	58
Bangalore	4.0	2.2	8.0	2.2	100
Osaka/Kobe	8.0	8.2	7.7	6.9	-3.7
Milan	7.0	16.8	7.5	15.7	7
Chicago/N.W. Ind.	6.8	4	7.2	3	6



Super Cities
(Cities expected to have 7 million or more population in the year 2000)

Table: II Estimated Mega-City, Large City, Urban, and Total Population by Less Developed and More Developed Regions and World Total 1980 - 2000 (in Billions)

	1980			2000 Projections			Percent Increase (1980 - 2000)		
	LDR	MDR	WORLD	LDR	MDR	WORLD	LDR	MDR	WORLD
Mega Cities	0.11	0.10	0.21	0.35	0,13	0.48	218.2	30.0	128.6
(7,000,000+)	(11)	(8)	(19)	(25)	(10)	(35)			
Great Cities	0.18	0.13	0.31	0.54	0.18	0.72	200.0	38.5	132.3
(4,000,000+)	(23)	(15)	(38)	(61)	(21)	(82)			
Large Cities	0.35	0.30	0.65	0.96	0.40	1.36	174.3	33.3	109.2
(1,000,000+)	(124)	(110)	(234)	(294)	(146)	(440)			
Urban Population	1.01	0.80	1.81	2.15	1.01	3.16	112.9	26.3	74.6
Total Population	3.29	1.13	4.42	4.93	1.27	6.20	49.8	12.4	40.3

NOTE: Figures in parentheses indicate the number of cities in each category.

SOURCES: Based on United Nations estimates and projections in : World Population Trends and Policies: 1981 Monitoring Report, vol. #1 Population Trends (N.Y.: U.N., 1982); an Urban, Rural and City Population, 1950-2000, as assessed in 1978 (N.Y.: U.N., 1980).

2. Polarization Reversal and Urban Systems

The process of "polarization reversal" (Richardson, 1980) is beginning to occur in an increasing number of more developed countries both in the West and the East. While we do not yet fully understand the forces and timing of such a process, it does seem to be contingent on achieving a higher level of development and a more equitable distribution of budgetary, decision making, and political power. Indeed decentralization strategies have more success where local governments are strong (Stöhr and Tödtling, 1978). Furthermore spatial deconcentration of urban population is either emerging or has already occurred in countries both with (Sweden, France, Poand) and without (United States, Japan, R. Korea) strong urban decentralization policies (Vining and Kontuly, 1978).

Such trends suggest that the urban future is one of long range convergence in patterns. It implies that processes and problems of concentration inter-regionally (centered on core regions) and intra-regionally (focused on central cities) would eventually give way to the reverse processes and problems of deconcentration and dispersion respectively. Regions within national spatial systems will tend to follow a similar pattern in which the most developed region (core) is likely to be the first to undergo a process of intra-regional deconcentration, followed by other regions as they reach appropriate concentration and development thresholds. In fact deconcentration within the core region (mega city region) would likely precede and signal the onset of polarization reversal (El-Shakhs, 1980).

The process of polarization reveal is predicated on continued economic growth and developments in transportation and technology, innovation diffusion, shifts in locational preferences and similar reversal pattern in the rates of national population growth. The ultimate result is the "total urbanization" of spatial systems in the form of vast interdependent "urban fields" or urban regions.

Countries undergoing the process of urban concentration are faced with the task of promoting national economic growth and full utilization of their resources yet, at the same time, promoting regional equity and avoiding or reducing excessive development disparities and concentration. While these two objectives may not necessarily be in conflict, particularly in a long range perspective (Stöhr, 1975), they require coordinated economic and spatial development policies at both regional and national level. Major spatial shifts in population and economic activities (inter-national, inter-regional and inter-urban), whether they tend towards concentration or deconcentration, are likely to continue indefinitely to shape and reshape our urban system. An effective response thus requires a better understanding of long-range patterns of change, the capacity to influence them through public policy, and a continuous national effort to equalize the levels and burdens of social welfare and of urban services and amenities.

The challenges to such policy and planning efforts lie in their ability to:

a) anticipate future spatial structures and, in the process of attempting to solve current problems, lay down the basis (in terms of both physical and institutional infrastructure) for their eventual emergence,

b) hasten the process of spatial transition and moderate the rates and impacts of extreme spatial shifts (first of concentration and later of deconcentration),

3. Implications for the Growth of Mega Cities

Obviously the factors influencing the future of mega cities and their regions will largely be determined by the development of their national urban systems and their places within the international hierarchy of "World Cities" (Friedman and Wolff, 1982).

However, the nature of the impacts of the processes of polarization reversal (national or international) on the mega city and its region are in large part, a function of their current long range planning and the resulting spatial and political organization. The preceding analysis raises several relevant issues and questions in this respect.

Will current population projections for mega cities turn out to be accurate predictions? It is already clear that the corner on the population explosion has turned much faster than anyone predicted (Abu-Lughod, 1982). Furthermore, projections not withstanding, several mega cities (metro areas) already began to slow down, stabilize or lose population (New York, Paris, Calcutta). Given polarization reversal trends, several other mega cities in middle income countries may soon follow suit.

There is always a danger in the tendency to overbuild the centers of mega cities during periods of concentration and rapid growth. The resulting rigidities in terms of capital plant, industrial infrastructure, production technologies, work patterns, and property and political interests may inhibit their responsiveness and ability to adapt to future economic shifts and processes of deconcentration. The incidence of physical and technological obsolescence would severely limit their competitiveness and capacity for renewal of their capital plant and employment base (Sternlieb and Hughes, 1978).

Overbuilding mega cities, within their currently defined boundaries, is a short range response to the systematic overload on their infrastructure and supply of productive employment during periods of concentration. Such pressures however, often result in the expansion of the city's influence and functions over a much wider region, including other cities and rural settlements and a frequently uncontrolled and unplanned periphery. This requires a redefinition of what future mega cities imply. Administrative and political boundaries and definitions effectively lose their meaning both under conditions of concentration and deconcentration. What is required is to establish meaningful and workable mechanisms for regionwide planning and administrative coordination and control of development. Such mechanisms and institutions should be flexible enough so that their authority and its boundary could be expanded to fit those of the phenomena.

While spatial polarization may be inevitable within the national urban system, this need not be the case within the core region. Appropriate long-range plans should anticipate and organize the spatial and economie differentiation of the core region's expansion. Unlike the conventional wisdom of attempting to forcibly limit core region's growth and physical expansion, this would call for recognizing and directing such expansion in ways which suit their particular spatial context. Such plans should provide an alternative to the excessive physical expansion of the large central city itself, to dispersed patterns which are expensive to serve and wasteful of energy, and to uncontrolled expansion into valuable farm land, ecologically sensitive areas or natural features worthy of preservation for a better use.

4. Long Range Planning Implications

Generally speaking, a more efficient spatial organization of mega cities can be achieved through a set of consistent spatial planning policies whose aim is to articulate and redefine their internal structure in terms of an integrated hierarchy of interdependent activity centers and population settlements. Such policies include:

Containing the horizontal expansion of central cities.

Articulating the internal structure of central cities into identifiable communities around viable business subcenters.

Restructuring peripheral developments into identifiable communities around activity subcenters and concentrated development nodes.

Promoting and guiding the inevitable development of urban regions along corridors of intense interaction with other major cities.

Promoting area-wide differentiation of functions and specialization of settlements and activity centers within the mega-city subsystem, whose boundaries are expanded to include those areas necessary for a balanced interdependent self-reliant development.

Expansion and reorganization of administrative and planning functions to provide area-wide coordination, yet strengthen local autonomy, initiative, and identity both within and outside the central city.

Containing the Horizontal Expansion of Central Cities

One inevitable short-sighted response to the rapid growth of mega cities has been the continuous incremental vertical and horizontal expansion of the main built-up area. Whether planned or not, such contiguous development are convenient and relatively more accessible to existing, utility and service systems, which are frequently over-extended. They are also more readily identifiable with living in the large city, compared to more distant areas. Such horizontal expansion often falls outside urban administrative jurisdictions and their planning and building controls and regulations.

The consequences of such growth patterns are many: (l) unplanned rigid and long-lasting built environments with little or no limits or safeguards dictated by the natural environment, sustainability, or human scale; (2) extreme overloads on utility and transportation systems with frequent breakages which threaten the health and safety of the population; (3) decreasing accessibility to jobs, amenities and open space; (4) and increased levels of congestion and concentrations of environmental pollution among others. An alternative development pattern should attempt to spatially separate new urban expansions from the built-up area of the central city and reduce dependence on its utilities and service systems. They should, however, be made easily accessible to and identifiable with the central city if they are to become viable growth alternatives.

Such multi-nucleated development pattern requires a two-pronged strategy of increasing the supply of accessible urban land in planned locations, on one hand, and tightening land development and preservation controls on the other. The first requires transport expansion of

[redacted]

It is estimated that roughly as much built environment as now exists will have to be constructed

Such approach would help minimize the potential adverse impacts of deconcentration on the central city and allow for its orderly transformation through incremental conversion, renovation, and adaptive reuse programs. It would help redefine the functions of the main center and of secondary centers, provide room for expansion and often badly needed open space within the main center, separate major non-compatible uses, and deconcentrate congestion and environmental pollution. Ports, manufacturing, warehousing, sports, resorts and recreation, wholesale animal and vegetable markets, universities and research centers, and national government offices provide a few examples of potential specialized settlement functions.

Promoting Local Autonomy and Initiative Within Area-Wide Coordination

In both growing and declining core regions, administrative and political boundaries have lost their meaning. In either case, a large and growing proportion of the mega-city region's population lives outside the city boundary. Yet they frequently impose major burdens on its economy and service systems without contributing to its resources or being influenced by its management. The processes of concentration and deconcentration within the super-city region, and their consequent pressures and conflicts, are not only inequitable and difficult to manage but could also be extremely wasteful and inefficient in the absence of planning and coordination at the regional level.

Thus the first step in facing the challenge of mega-city growth is to establish meaningful and workable mechanisms for region-wide planning and coordination and control of development. They should articulate a division of authority and responsibility that maximizes local participation while preserving integration at a regional scale (Bauhaus Seminar, 1991). Such mechanisms and institutions should be flexible enough so that their authority and its boundary could be changed to fit those of the phenomena. They should be designed to strengthen local identity and initiative within an expanded integrative framework of regional administration. Both autonomous and planned deconcentration within the mega-city region create higher levels of inter-dependency and intra-regional mobility. This tends to shift the focus of effective policies from the city or metropolitan level to both higher (regional) and lower (local) levels of government. The effective division of functions and authority between local and regional levels calls for more, rather than less, administrative coordination and government responsibility. Yet local initiative and control at the small scale of towns and districts, in a spatially and administratively decentralized settlement system, would enhance self-reliance and sustainability for many urban functions. This would reduce the burden on the mega-city government and thus enable it to cope with the increasingly complex systems of interaction and regional functions.

5. Conclusions

This poly-nucleated spatial organization combined with a multi-level administrative approach provide a flexible strategy adaptable to future uncertainties. It would anticipate and minimize the adverse impacts of the likely long-range trends of deconcentration. On the other hand, it would help organize urban regions along manageable and humane dimensions, were they destined to continue their unabated growth for long periods in the future.

Such spatial pattern would, at the same time, promote a more sustainable development process. It would help preserve human scale and promote a sense of identity, local initiative and control, self-reliance and access to nature. The efficient use of urban land and of energy resources through an optimum distribution of population within a balanced system of settlements would go a long way towards preserving natural capital.

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SUSTAINABLE DEVELOPMENT - A PERSPECTIVE

P . K . Muttagi

Abstract

For the last several years, planners, policy-makers, administrators, activists, social scientists and others have been studying the socio-economic problems of developed and developing countries. They have been using various approaches and techniques to tackle these problems, but with little success. In recent years, the phrase sustainable development has come into wide use among them to signify the goal of an environmentally stable economy, especially in the third world. It is an encompassing principle of the earlier concepts of development and emphasises the need to meet the present requirements without, in any way, compromising the future generation's capacity to meet its needs.

The paper briefly analyses the current environmental crises and indicates some measures for sustainable development.

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1. The Global Setting

Technological advances have led to economic prosperity, changes in demographic, social, cultural and political systems of the community and psychological make up of the people all over the world. The consequences of such dynamic situations vary from one country to another, and also from one group to another within a country. The economic development may not always lead to improvement in the quality of life of the people of a region. It may frequently lead to reinforcement of the existing disparities and foster a fragmented sense of self and at times to social unrest. The techno-economic and socio-political changes in the contemporary society are varied and inextricably linked with each other and with ecological changes at the local and global levels.

The advances have also resulted in the environmental degradation: Acid rain, the hole in the ozone layer, the greenhouse effect, car exhausts, nuclear waste, water, air and noise pollutions, the destruction of the tropical rain-forest, pesticides, whaling, famine and other environmental problems. The detrimental effects on the environment of man's activities now extend even to the most remote and inaccessible parts of the globe where man himself seldom if ever ventures. The depths of the oceans and the ice of the polar regions are tainted by the wastes he so carelessly throws to the winds and the waters. But it is in his settlements, those parts of the global environment where the majority of men spend the greater parts of their lives, where their social and economic activities are most densely concentrated, and where the opportunities for individual

and collective satisfaction and advancement are greatest that the most dramatic changes take place and the most intensive conflicts occur. It is here that the quality of the environment is particularly critical to human beings' health, welfare and happiness (1).

These problems have been frequently discussed in the media, they are increasing our awareness of the issues involved. But beyond the awareness and concern which many people increasingly feel, how do we now see our future environment? Is everything being tackled and solved, as some politicians would have us believe, or is everthing getting worse? Are we hopeful of achieving some utopian state or are we pessimistic? Will we have pure rain, no pollution, lush forests, abundant wildlife and a comfortable quality of life with pleasant homes, security and the sustainable use of the available resources of the earth? Or will we disappear in a welter of environmental disaster and wars over territory, resources and living space (2)? To answer some of these questions we must know the present state of affairs and what prevents us from solving the environmental problems.

2. Demographic Characteristics

Today's environmental trends are a consequence of the twentieth century's exponential growth rates. In 90 years, world population has tripled, the global economy has grown twenty-fold and fossil fuel use tenfold. It took all of human history for the world economy to reach $600 billion

According to the World Commission on Environment and Development, between 1985 and 2000, developing countries will need to have increased by 65 per cent their capacity to build and manage urban infrastructures, including transportation and sanitation systems, utilities, schools and hospitals. Developing countries cannot cope with it.

Many cities in the industrialised world likewise face the need to refurbish crumbling urban infrastructures. Often they must do so at a time when their industrial base has weakened and their populations have aged, with a now smaller proportion in the tax-paying work force. Air pollution, traffic congestion, noise and urban violence are similar in large cities around the globe. But with their slower rates of population growth, greater financial resources and more highly educated populations, the cities of the developed world are much better prepared to resolve urban problems. Cities in many less developed countries face the prospect that urban problems will worsen substantially through the coming decade and beyond as population growth outruns investments in new urban infrastructures.

3. The Socio-Economic Scenario

After several decades of efforts to achieve rapid economic and social progress, we have been witnessing a severe contradiction in the levels of investments, growth of production, international trade, consumption and distribution systems in different parts of the world. To understand future

for growth in certain sectors, they are encountering severe stagnation and inequality. In South Asia, the top 5 per cent of the population controls 22 per cent of natural income, while the share of the bottom 20 per cent is less than 6 per cent.

The third world is made up of poor nations, poor societies and poor people. These are the live societies that have social and political dynamic of their own. Because of the impact of social change, of population growth, of education, of communications, of exposure to the media, there are powerful processes at work in these societies which are not tending towards stability, but rather giving rise to expectations and aspirations which governments practically everywhere find difficult to respond to. These countries are less stable than they themselves were during the earlier period. One by one the third world countries are becoming ungovernable. No matter what the complexion of the governments - right wing, left wing, military or democratic - they are all in situations of not being able to respond adequately to the expectations of their people aroused by media, by communications, by education (7).

4. Environmental Crisis in the Third World

Environmental deterioration in the third world can be attributed to industrialisation, depletion of traditional sources of energy and raw materials, constant population growth pollution of natural resources, the destruction for economic ends of various animal and plants species, water air and noise pollutions, and the negative genetic consequences of industrial pollutants. The econological crises in the agro-ecosystems arising out of the erosion of soil, water and genetic diversity are related to the increasing tendency to view the aricultural sector as the consumer of industrial products like fertilizers, pesticides and hybrid seeds. Agricultural policy which affects rural development directly is increasingly focussing on providing these inputs at the neglect of maintaining and strengthening the intrinsic ecological stability and productivity of agro-ecosystems. The crisis emerges from the technological changes is not restricted to agro-ecosystems only. What is done to the land also affects the waters since the marine ecosystem is the final repository of our lost soil, pollutants, urban wastes, as well as being damaged by activities like dredging, trawling, and reclamation.

Environmental crises are due to wrong orientation of science and technology, misuse of political and administrative powers; rampant corruption, nepotism, favouritism in most of the departments; misuse of funds; lack of interest in welfare activities; deterioration in public morality; lack of national character; implementation of the plan by untrained personnel; escapism from responsibilities; division of society on the basis of caste, creed, class, religion etc. The developing countries are imitating the western world and using their technologies without considering its ecolgical impact. Environmental crisis is the cause as well as the consequence of rural and tribal environmental degradation.

The environmental stress has often been seen as a result of the growing demand on scarce resources and the pollution generated by the rising living standards of the relatively affluent. But poverty itself pollutes the environment, creating environmental stress in a different way. Those who are poor and hungry will often destroy their immediate environment in order to survive. They cut down forests; their livestock will overgraze grasslands, they will overuse marginal land, and in growing numbers they will crowd into congested cities. The cumulative effect of these changes is far reaching as to make poverty itself a major global scourge. Increasing demand for various products and services due to population growth and the changing power equations between different social classes have sharpened the resource conflicts. The hazards overspill political boundaries to affect vast geographical regions, they also embrace the world ocean and ultimately into an international menace. Some of these global hazards are directly related to international politics. The spread of radio-active radiation in nuclear tests, armsrace and military operations and pollution of the oceans have directly or indirectly some bearing on politics. The greatest danger to environmental standards however, arises from the lack of development itself. Lack of safe drinking water, housing, inadequate transportation, food clothing and other basic needs are elements of poverty, and sources of danger and degradation to the human environment. They can be tackled only by all-round development in industry, agriculture and forestry, the infrastructure and other services. Both socio-economic and politico-administrative aspects are involved in environmental crisis and deterioration in an area is not always confined to that area, but spreads to different areas and regions, the nature and depth of environmental crises in developing countries raise serious doubts about correctness of the growth-based strategy of economic development. Unless a drastic shift in the policies to development based on sustainability, safety and associated environmental considerations is introduced, the process of growth will neither be able to sustain itself nor can the large scale under development of the poor and marginalised majority be avoided.

Development scientists have been pursuing different approaches starting with growth in terms of Gross National Product (GNP), slowly turning to growth with fair distribution of that growth and shifted to the basic needs approach with emphasis on improvement in the standard of living of the most disadvantaged but with little success. It was soon realised that these approaches are inadequate, that economic growth is a mixed blessing and there are definite limits to the growth that can be achieved as certain resources from nature, needed for the growth are incapable of reproducing themselves if once exploited. Today, they have been talking about sustainable development. Being popularised by the Report of the World Commission on Environment and Development (The Brundtland Commission, WCED,1987) it has become a key concept to explain the economy-environment relationship. It implies that basic needs for food, clothing, shelter and jobs must be met in such a way that they do not compromise the ability of future generations to meet their own needs (8).

5. Ecological Approach

Economists and practioners generally assume that economic growth can take care of the environment through proper pricing of goods, greater efficiency of resource use, improved technology and better management techniques.

Many ecologists feel that this sort of assumption is based on the superficial understanding of the environment. If we continue like this, we may be fast approaching absolute limits to material economic groth. Trading off ecological damage for economic benefits and still hoping to achieve sustainable biosphere cannot be done. They consider certain ecological and thermodynamic principles that must be respected and add that the basic ecological requirements for sustainability are not negotiable. The following arguments advanced by William E. Rees summerise the

ecological approach (The arguments incorporated in the following pages are taken from "Understanding Sustainable Development", by W.E. Rees, 1991).

All material economic production is actually consumption since our economies are growing and the ecosystem within which they are embedded are not, the consumption of resources everywhere has begun to exceed sustainable rates of biological production. Consumption and pollution destroy ecologically essential resources with no signal from the market place that the very basis of survival is being irreversibly eroded, and there are no technological substitutes. Ecosystems are inherently self-sustaining and contribute continuously reducing global net entropy, but human disruption of ecosystemic relationships on global scale would severely compromise the possibility of achieving sustainable development. Humankind must learn to live on the interest generated by remaining stocks of living natural capital.

The acceptance of ecological constants, obviously places unaccustomed boundaries on the debates of arriving at a politically expedient interpretation of the concept through the usual compromise of interests. The basic ecological requirements for sustainability are not negotiable. However, satisfaction of ecological criteria is a necessary but not sufficient condition for sustainable development. Any proactive prescription for sustainable development must acknowledge the primary role of bioresources in human survival and the inequity inherent in current practice, maintenance of the functional integrity of the ecosphere is a necessary prerequisite to extending the time horizon for economic policy and to elevating both intra and intergenerational equity to a place of prominence in developmental decision-making.

The point Rees emphasizes here is that while the mainstream sees sustainable development in terms of marginal adjustments to the status quo, a true alternative is congealing around new values associated with spiritual development, harmony with nature and mutual reciprocity. Disallowed in technical analysis, such unmeasurables have been relatively neglected in conventional approaches. Rees observes that developing sustainablity requires profound changes in existing power relationships, a reordering of cultural values and massive institutional adjustments. For sustainable development, the need is more for appropriate philosophy than for appropriate technology. If we tend to ourselves, nature will take care of itself (9).

In advancing this thesis, Rees has marshalled evidences from a large number of sources. The notes and references are exhaustive and impressive. These include the writings of medieval continental thinkers, present day economists, ecologists, planners and others. It has referred to the views of the contemporary thinkers like Capra and presumably to Teilhard de Chardin. The notes and references cited are exhaustive and aruments convincing. However a researcher will get additional insight into the intricate issues by considering the views of thinkers like Schumacher (small is beautiful) M.K. Gandhi (Community self-reliance, mass production vs. production by masses, each according to his/her own needs trusteeship and so on. Referring to the distinction between growth andV development. Rees observes that growth is quantitative change in a physically non growing economic system in dynamic equilibrium with the environment. Sustainable growth in a finite environment is a logical impossibility but sustainable development contains self-contradiction. This distinction between growth and development is extremely important.

Interpretations of sustainable development and its implications for planning vary as widely as the ideologies of its various proponents. Rees focuses on ecological realities that must be accomodated by any realistic approach irrespective of interpretation. He assumes a global perspective on the ground that if the basic argument is correct, the success of sustainable development initiatives anywhere are dependent on sustainable development everywhere. This is an interesting assumption. It helps to view the developmental issues from a wider perspective.

To develop sustainable urban communities it is necessary to take several actions. Rees' article on sustainable communities (plan Canada May 91) outlines in tables 1 through 6 several kinds of initiatives by government and public bodies. These include traffic planning and traffic management initiatives, energy conservation initiatives, waste reduction, improving community livability etc. to deal with socio-economic and ecological complexities. These measures include initiatives like bicycle transportation, street redesign, community land trusts, solar oven cookbook, packaging restrictions, gender equity, eco counselling (10). These have been used in several urban settlements in different countries. It is necessary to examine their effectiveness in sustainability and explore the possibility of using them in other countries.

On the basis of the findings of his studies, Rees proposes 25 practical guides to global sustainable development. A study of these principles shows that some of them are statements of facts, some are beliefs, some can be implemented with certain adjustments within the system and some are extremely difficult to implement in the present socio-economic situation, but all of them need to be studied, discussed and evaluated before communicating them to planners, policy makers and other concerned.

Rees feels that sustainable communities will be cleaner, healthier and less expensive; they will have greater accessibility and cohesion; will be more self reliant in energy, food and economic security than the communities now are. Someone has to demonstrate leadership in developing the knowledge, alternatives and technologies which the world requires for sustainability.

Like Rees, there are many respected thinkers who believe that such a development demands cessation of growth and major reconstruction of the whole global economy along the conservationist lines. However there are others who believe that it is not possible to maintain the natural resources without any change. A strictly conservationist position is not practicable for it is impossible to use even a renewable natural resource and at the same time leave it unaltered with exactly the same quantities as before, nor can human needs be satisfied without some consumption of non-renewables. The real problem is on the one hand, there is want on resource destruction which cannot be stopped, at the same time reliance on natural renewability is not practical. Under the circumstances there are no easy solutions.

Harold C. Brookfield feels that undoing unsustainability and building sustainability in its place will be an enormous task, against great opposition and made much worse by uncertainities, aggrevated by human action, with which we have to live in the foreseable future. It is further made worse by the widespread distrust of government, the interventionist role of which is critical to success. Sustainability does demand attention the regenerative capacities of the biosphere but there is much that human artifice and a wise technology can do to assist this necessary set of adaptations, while improving both the natural and human condition at the same time. These

observations need to be investigated carefully in order to develop management strategies, technology and artifice that will ensure sustainable growth.

Before tackling the ecological issues at the global level, it is necessary to understand the situation in developing countries.

It has been argued that sustainable development includes two key elements, one is the meeting of needs and in particular the needs of those who have been left far behind in a century of extraordinary growth. The second element concerns the limits which world society must now impose to protect the resource base of our environment both locally and globally. Therefore sustainable development imposes standards of consumption which must be met within the bounds of ecological possibility.

Both the elements are multidimensional and extremely complicated to handle. The first one is primarily the problem in developing countries. The second one is that of the developed world, through it is applicable to the sizeable section of the affluent groups inhabiting the third world.

Developed countries have reached certain levels of growth. They have accumulated huge capital, skills, technology and other resources. Population is literate and not growing alarmingly. Number of the poor is significant, but hopefully manageable. These countries are culturally more homogeneous than some of the developing countries and have necessary infrastructure. By utilising the existing resources efficiently and making marginal adjustment in their pattern of consumption and lifestyle, it is possible to provide the necessary comforts for the entire population. They can and should introduce measures of sustainable development. Some attempts have already been made in the developed world.

Socioeconomic situation in developing countries is far more complex and merits discussion. An overwhelming majority of the population (80%) lives in rural areas. A majority of them are poor, illiterate and carry on the same traditional occupation without resorting to modern technology. The ecological crises in the agro-ecosystems arising out of the erosion of soil, water and genetic diversity is related to the increasing tendency to view the agricultural sector as the consumer of industrial products like fertilizers, pesticides and hybrid seeds. Environmental deterioration in urban areas can be attributed to industrialisation, depletion of traditional sources of energy and raw materials, constant population growth, pollution of natural resources, destruction of various animal and plant species for economic ends, the artificial sound amplifiers and other noisemaking systems including heavy traffic and the negative genetic consequences of industrial pollutants.

The environmental stress has often been seen as a result of the growing demand on scarce resources and the pollution generated by the rising living standards off the relatively affluent. But poverty itself pollutes the environment, creating environmental stress in different ways. Those who are poor and hungry will often destroy their immediate environment in order to survive: they cut down forests, their livestock will overgraze grasslands, they will overuse marginal land, and in growing numbers they leave rural areas and crowd into congested cities and join the households living in slums and shanty towns which are unplanned and planned sector. By and large, each settlement is divided into unplanned sector and planned sector. The latter is always in danger of being surrounded by the unplanned sector. In these countries there are large numbers of people who have been deprived of basic necessities for survival water, sanitation,

housing, employment and medical facilities including vaccination and inoculation. Further, developing countries are totally diverse in the development that they have been able to achieve. Each country differs from the other in every conceivable dimension such as size, size of the population, homogeneity of culture, capacity to mobilise resources, infrastructure facilities, trained and skilled personnel and technological management, while a country like India has become almost self reliant in many fields, there are several others that are still to be even convinced of the possibility of they attaining their self-reliance. Some of the countries have enacted social legislation to help the poor to seek Justice, but implementation machinery is poor. Both the government and non-government organisations have been making efforts to bring the poor and other underprivileged groups together to form them into an organisation in order to empower them, but without much success. In some countries NGO movement is strong and growing from within.

Developing countries have been striving to meet the socio-economic needs of their people with the help of the developed nations, particularly in the last 40 years. They have been receiving in large quantities both financial and technological aid for ameliorative as well as developmental purposes. This process has led to establishing a complex set of institutions; multi-lateral, bilateral, official,non-governmental which has resulted in estabilishing peculiar relationship with the native institutions. Incidentially, it will be interesting to find out whether these institutions are part of the problems or part of the solutions. If they are part of the problems is it due to their concept of development.

What needs to be noted is that notwithstanding all the development efforts that have been carried out in the recent past, and are still being carried out with a view to improving the situation, nothing substantial has been achieved in improving the quality of the life of the poor. The severe economic deterioration of the majority of the countries, coupled with increased evidence of widespread degradation of the environmental and natural resource bases on which the economies of these countries so largely depend has forced reexamination of the development experience and the premises on which it is based. In short, despite massive help, poverty is increasing and environment is deteriorating. This is the most serious threat the world is facing.

Researchers have attempted to analyse the causes of ineffectiveness of the development programmes. They have found for example that the international aid agencies and official and nongovernmental agencies from the developed world assume that technological and capital transfer could bring about desirable change. They invested their money, time and expertise to bring about desirable changes. Failure is attributed to lack of participation from the beneficiaries and poorly managed delivery system to distribute the benefits of development to the poor. It should be noted that technology and financial aid may be part of development but they are only small parts. More significant are people's determination to make things better for themselves; the accountability of those in power to those they propose to help develop, people's willingness and abillty to change their cultural patterns, their administrative patterns, their educational systems and sometimes their political systems. These are all parts of development. Development involves change in all aspects of any system which is developing.

There have been inequalities in income, employment opportunities, education skills, health and several other fields. These are along ethnic, religious, gender, caste or tribal dimension. But the important point is that on each dimension, there are some haves and many have-nots that is a

small group of elites and large numbers of masses. The haves get greater access to information and opportunities to make money, to acquire education and skills and lead good life of ten at the cost of the deprived and the damned. The development has actually reinforced the existing socio-economic disparities.

The development efforts should recognise that equity is a necessary condition and the authorities must ensure that the needy people are benefitted. If the rich get richer and the poor become more in number and less in wealth, such development does not lead to desirable results. If development discriminates aainst women and children and if it ignores the minority groups and minorities do not join the main stream in developmental activities, no development can sustain.
The existing strategy has contributed to economic growth of several project areas, but not to social justice and ecological balance.

There was no proper appreciation of the strengths and weaknesses of the institutions and individuals who are involved in development activities. Project management was entrusted to the people who utilised the opportunity to exploit the poor to make money and to enrich those who kept them in power. The greatest need of the hour in the developing countries is inspiring and committed leadership at the top at both official and non-official levels to plan and implement the programmes with vigour and devotion. Such leadership at the top and top down approach alone and not bottom up will succeed. The leaders can motivate the people down the line, change the indifferent administrative set up, educational and political systems and deliver goods. Leaders in the third world have done it in many places in the past and are still doing it. Some are running development projects efficiently and by setting personal good example, they have changed the people below them. They are not well qualified professionals but highly committed workers. The projects run by these leaders are productive, efficient and sustainable. They are based on the traditional approach to development. It is not the professional expertise but committed leadership which delivers goods. The modern development projects like integrated community development programmes and social forestry have been managed by qualified and experienced personnel, some are professionals. They have been implemented enthusiastically and with due publicity. We are not quite clear about their impact on improving the quality of life of the rural people and preserving the environment.

Poverty is not new to the developing countries. A good majority of the people have always remained poor. The rural and tribal groups have learned the strategies for survival in their own ecological niche. Over the generations and by trial and error, they have learned the techniques of coping with poverty and in their own way preserved the environment. They have been preserved through beliefs, customs and traditions. All of them did not contribute preservation of environment. Even more customs and tradition which helped to maintain ecological ballance are gradually disappearing on account of modernisation. Public disregard for local and traditional knowledge has been destroying wealth of information that has taken thousand of years to build up. Systematic efforts need to be made by the authorities to record such knowledge, identify those aspects which contribute to ecological balance and encourage the people to retain them.

Today on account of scientific and technological progress, particularly in mass media of communication, people in developing world are exposed to the western values, life styles and comforts enjoyed by the people in developed world. In many countries, the economic progress and culture. In the context of rising awareness for improvement in their socio-economic status, the economically and socially deprived groups have been demanding a greater share in whatever is produced. Everyone would like to enjoy the comforts and luxuries. Both poverty and feeling of deprivation need to be tackled. Motivating the poor is not enough. Their needs and requirements should be satisfied. Under the circumstances rapid economic growth appears to be the only solution. One cannot fuel development so conceptalized without an increase in the consumption of matter and energy resources, some of them non-renewable and with toxic waste products. On the other hand, mass aspirations for products of modernity and good life have been fired to such an extent, the cultural changes that imply high resource use have occured so fast, that no-mass-based politician can hope to even reach first base if he or she advocates a zero-growth purely environmentalist agenda.

The existing models of development have led to severe economic deterioration and environmental degradation. In view of this, policy makers, planners and change agents will have to rethink the basis of development co-operation and technology transfer. To achieve rapid economic growth, perhaps major changes in institutional framework, administrative set up and reexamination of developmental strategy for efficient use of existing resources are necessary. The present planning strategy has led to providing expensive services to some. It should at the same time aim at providing the minimum to the rest. The new development strategy has to be a combination of western and native ideas. The new policy should focus on larger productivity, greater self reliance and a much better economic growth with proper delivery system and accountability. In the absence of achieving certain levels of growth and efficient and equitable distribution of goods and services, any measure which is aimed at achieving sustainable development will receive set back.

It is important and necessary to appreciate that sustainable development involves several continuous on-going processes of change and adaptation in which exploitation of resources, the direction of investment, the orientation of technological development and institutional change are all in harmony with each other and together aim to satisfy the needs and aspirations of all people, keeping in view the requirements of the future generation.

Sustainable development is based on the processes that are efficient, equitable, environmentally sound and endogenous. Developing countries must achieve economic growth with equity first and then strive for sustainable development. There is no shortcut.

What remains universal, however, are the processes involved in analyzing situations and in drawing up solutions. The premise that humans must live symbiotically with the ecosphere is a good enough framework. This then can be used within the context of the existing socio-political and economic conditions of the communities involved. It is therefore possible that while working towards sustainable development, a poor, disenfranchised community in a remote rural area may have to do some "resource exploitation" on a limited scale, for a limited period of time to uplift themselves economically. To remain true to their sustainable development agenda, they may have to create networks with other communities in the area and with other sectors outside to work towards removing a big mining or logging firm whose activities are definitely more exploitative than theirs. To ensure that no one else in the community will emerge to lord it over them, organizational structures can be set up to enforce guidelines. The continuing vigilance of people's groups supported by responsive agencies from outside the area will hopefully keep exploitation of both people and resources at bay. And rather than keeping people at subsistence level (while the rest of us enjoy prosperity this process can give people a fighting chance towards empowerment.

At first glance, it may be difficult to imagine people actually organizing themselves for the above purpose, but fortunately, activities such as those outlined above are actually being done. Of course, the situation above is a highly simplified version of reality. There are setbacks, notably when the military (most of the time in cahoots with vested interests) come in and destroy what has been painstakingly built by communities. However, the necessary ingredients of socio-economic work and political empowerment within a sustainable development framework are all present. In other contexts, the emphasis may be on economic empowerment only or even just on value-formation for sustainable development.

Networking towards more egalitarian world relations

Together with the search for solutions to ever-increasing environmental problems, the finest minds in the West can work towards "alternative relations" with people from developing countries. Traditionally, world relations have been defined in terms of government-to-government dealings which merely propagated an autocratic system. Those concerned with sustainable development can do much better with alternative international relations especially with people's organizations (most developing countries with unresponsive governments have many of these) because these groups are more likely to "act locally" and benefit most from "world orientations."

* The Cordillera is a mountain range in the Northern part of the Philippine island of Luzon which is home to around a million people from around 14 ethnolinguistic groups, collectively known as the Igorot or "mountain people." Although there are variations, these groups have highly evolved political and cultural systems which remained largely untouched during the colonization of the Philippines by the Spanish cultures.

THE POLITICS OF ENVIRONMENT AND SPACE: THE BATTLE FOR SUSTAINABLE DEVELOPMENT?

On-Kwok Lai

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1. The New Socio-Political Context

To elaborate the discourse on sustainability we highlight the new context in which the states likely situate -the politics of environment and space- and mediate various conflicts. This discussion will be maintained at a general level so as to generate more propositions for future study. Under this premise, this paper outlines the related contextual specificity, under which the state project is, and will be engaged, and examines the synergetic effects of the various socio-political constellation of the modernity, (1) then the new form of Gemeinschaft, lastly, the emergence of a new production mode.

Technology-Risk-Environment Syndrome

Modernization goes with the ever-changing uncertainty. Here, one of the products or process of modernization will be considered, namely, risk (versus safety) in general and the 'Technology-Risk-Environment' Syndrome in particular (2).

Man-made disasters, some name them as 'accidents', have again and again, shocked and changed people's Weltanschauung, as people had not well prepared for the invisible killers, vis-a-vis the 'success' and hegemony of (perhaps the last) technological revolution -- nuclear energy is only one of them. We are now, in this (post)modernity, experiencing another historicity: Risk Society as named by Ulrich Beck (1986, 1987a, 1987b) -- the risks are global and invisible, and they multiply themselves at a geometrical rate and exponential scale, in our terms, the Technology-Risk-Environment' Syndrome. The Syndrome is defined here as the synergetic effects of technological development, associated risks and others, as calculated, reacted and felt by the public at large. The risks associated with our technologies, are being generated and communicated, the ramifications extend to various sectors of our society (Sjöberg, ed. 1987). This is not just the result of the structural changes of society with the technological revolution, but is also derived from the new historical relations between (socio-eco-technological) variables: people, nature, technology (3).

The available strategy is: risk-assessment. However, a risk analyst once rightly pointed out that "if the [risk] analysis shows that a particular category of accident can be expected, say, on average once in 1000 years, it does not follow that such an accident will not happen tomorrow. Neither does it mean that the analysis was wrong if it does happen." (Cross 1982: 61). In this respect, risk and its managements are controversial, not only do the experts find contradictory

findings, (4) but the field has become increasingly more chaotic after the catastrophes in Chernobyl and Bhopal. People are more uncertain about "How safe is safe?" For the technocrats and politicians: "What level of (probability of) risk is acceptable?". In spite of these problems, risk assessment is still being used as the dominant tool in providing the answer for most of the discussions on the siting and operation of the mega-industries which further generate Not-In-My-Backyard (NIMBY), and Not-In-Anybody's-Backyard (NIABY) protests (cf. Petts 1986, Armour 1991, Heiman 1990).

What state or quasi-state institutions could deal with the Syndrome is the (re)production of the 'acceptable level of risks' that is politically defined and determined, and is subject to the cultural (mis-)understanding of the communities involved. More concrete, this involves the dominance of state organizations in assessment, mitigating and accepting risks level (Clarke 1989). In other words, the 'acceptable level of risks' is determined by bureaucracy, implicitly those who have authority to define or access knowledge concerning the 'risks'. Ironic and more important are: the sophisticated risk models as calculated do not play a significant part in determining the outcome. Perhaps this is one of the manifestations of the poverty of science. In short, the decoupling between risk-assessment and the (institutional bound) acceptance on risks should be noted here that reveals only one contradiction of the Syndrome (5).

Another manifestation of the Syndrome, in the polity, is the politicization of production, namely, protests (rather than movements) against nuclear and hazardous installations, well before the sudden catastrophe of Chernobyl (Conrad 1987, Offe 1983). This phenomenon was not only seen in European countries, but (as capital and the trans-national corporations do) globalized and penetrated differently into various sectors of our living world as well (6) -- the emergence of alternative-green thinking in line with the movements seemingly was the dominant force of social change, juxtaposing the restructuring of global capitalism.

Furthermore, the risk and uncertainty issues have also led people to retreat to their private sphere that is enabled by the new technologies, particularly the information technology which enables people to engage in consumption and production process at home without much direct contacts with the external world-society at large. In this instance, the ways of political articulation and the ways of living -- lifestyles -- are changing which are more fluid and flexible in form and content (cf. Castells 1988, Saunders 1988).

Could 'science' (7), at this historical conjuncture, provide us the protection against risks in our society? Often, although not always, it is through quantifying the risks and the related variables (e.g. faults-events analysis), however, that could not generate discussion beyond expert's reasoning (that mostly in a close system of a priori assumptions). As rightly noted by the International Study Group on Risk Analysis: the whole analytical exercise [of risk analysis] might be considered to be objective. However, it must be realized that because of the large body of assumptions, estimates, judgments and opinions involved and thus much of the input information is often subjective.

In other words, despite the fact that the procedural aspects of estimation and modeling are usually perfectly done, the risk assessment is still biased (Douglas & Wildavsky 1982: 67-82). To conclude, the management of risks is very problematic and detrimental at this historical conjuncture that shapes the contours of the interface between technology and environment (8).

From a macroscopic account, the crisis-ridden system and the conditions of production in particular, namely the environment-cum-ecology contradictions of the capitalist system as highlighted by O'Connor (1988) are causes of the contemporary crisis (9). The crisis is manifested as the limits of 'science' -- the problematic of modernization process, on the one hand, and the New Politics that is related to the New Social Movements (NSMs), within and beyond the parameter of the polity, on the other (10).

The catastrophes, also more important are the protest movements, which push both industry and state to exercise more control and planning through regulation over production, consumption and exchange (12). Paradoxically, the decoupling between risk-assessment and its 'acceptability' which suggests that the state (and other institutions) has no (political) mechanism whatsoever to prevent the mega-scale technology-related disasters, nor steering the unprecedented ecological-risk problem (13). In fact, the state is "Still Muddling (in the embedded politics of production but) Not Yet Through" -- a phase used by Lindblom (1959, 1979). At this juncture, how state responds to these changes in the synergetic environmental-spatial process deserves some discussions. Before doing that, I outline the changing form of the Gemeinschaft.

The New Gemeinschaft Form

The conditions that determine the role of the state in the environmental-spatial process are given in context. Hence, the contextual specificity is outlined in this part to highlight the new form of Gemeinschaft in this historical conjuncture, or the shift of the conditions of modernity (14). Two distinct albeit inter-related processes are take place. First, the spontaneous development of the protest movements, and second, some people return to their private sphere.

One major 'sea-change' in the societal sphere is the development of the New Social Movements (NSMs). The NSMs quest for the 'new' form of Gemeinschaft that could fit into the mutual-development of people and nature (15). Protests -- to defense for one's interests or survival, Not-In-My-Backyard (NIMBY), on the one hand, and against technology, Not-In-Anybody's-Backyard (NIABY), protests (cf. Petts 1986, Armour 1991, Heiman 1990)

On the other -- have obviously been felt in the last two decades, ironically, juxtaposing the fetishistic development of Environmental Impacts Assessment (EIA) and the related modelings which are beyond the comprehension of the concerned citizens. Here, it should be noted that the phenomenon of oppositions against the EIA or the sitting proposal is not just related to people's perception of risks or technology, but is also based upon the people's trust in the creditability, reliability and regulation of the state and its related agents (Armour 1991: 68).

These movements are around three spheres of capitalism, namely cultural, political and collective consumption; particularly, the cultural and societal dimensions of the 'new' meaning of these movements that shape the discourse and struggles between people and market, between the communities and the state (in the name of nature or inter-generational existence) (16). The socio-political discourse also reflects the New Politics that has taken place beyond the state structure (17). In this way the controversies over risk are only part of the de-(r)evolutionary process of the modernity, to be precise, the crisis of the existence of people, animals and nature, following the liberation (project) from the spiritual, social and sexual constraints that happened in the 60s and

70s, on the one hand, and the technological advancement, on the other (18). Thus, the debates on the likely shift of the modernity or value-orientation should be situated on this plane.

What will be decisive, for our discussion, are the 'self-creative' societal forces which likely advance the boundary of and the creation of new public spaces beyond the technologically structured and defined society, and revitalize the old democratic forms (19); you may call it: the renewal project in 'another' modernity. Accordingly, people could foster a new capacity to invent and realize their future, and to politicize green issues and engage in every political discourse, because every political decision has green relevance (Naess 1989: 130-162). More than that, it is the politicization of technology (with and without risks) which critically re-examines technology against criteria of the environmental impacts and inter-generational effects -- a revitalization of the ideals of the modernity project; namely, not just to defend, but also to extend the public sphere, vis-a-vis state and economy. In Cohen's saying:

Indeed, they [ecological movements] can be seen as attempts to draw on the beleaguered cultural tradition of modernity to new forms of cooperation and meaning outside the province of economic and political steering mechanisms. (Cohen 1983: 109)

- This observation is shared by Melucci (1989) that the NSMs are a -fragile and heterogeneous social construction that create 'new' meanings and identities for the collective actors. In other words, the movements foster a new post-humanist consciousness (20), as a response to the challenges for One World to rescue it from the wild growth of both capitalism and 'communism', at least in environmental terms. However, it should be pointed out that the moments are fragile and subject to socio-political cyclical development (cf. Frank & Marta 1987). Because of this peculiarity, the impact of social movements is transient and not long-lasting, and the rise and fall of the movements thus are contextual and historical.

Nevertheless, the (ideological) claims of the NSMs are universal values (such as harmony between nature and people), with alternative form of life styles and beliefs (e.g. commune, self-help, and gender issues) which mostly do not correspond to any social policies nor institutions, and thus are revolutionary and emancipatory in some sense, temporarily yet significantly. In and through these movements the new (albeit fragile) definitions of environment-space are being re-constituted (22). Under this circumstance, the challenge for the people is: What should be (re)produced and consumed collectively and individually, or in what ways that will ensure a sustainable development?

In spite of the challenges of the protest movements to society, the individuals respond differently towards the impacts, - as the available advanced technology could enable individuals to avoid some crises -- and some of them retreat to the private sphere to temporarily enjoy their limited autonomy. This process goes along with the increasingly fluid social encounters and the de-differentiation (Entdifferenzierung) social process.

Postfordism and the Informational City

Juxtaposing the 'emancipatory' forces of the New Social Movements in the socio-polity and the social process of 'returning to private sphere', we have a flexible production system or the Postfordist mode of regulation as referred to (23), coupled with the increasingly 'fluid' social encounters, for instance, life experience is increasingly shapeless (24); from a macroscopic view, all appear or seemingly so as a 'disorganized' phase of (post) capitalism (25). More important are their synergetic impacts on spatial and cultural development, upon which our discourses on the change and transition of the modernity rest. Some of the consequences are: spatial unevenness, polarization of life experience (including underclass), and the gentrification process. Are these possible forms of Heterotopias of the contemporary postmodern city (?).

Yet all these 'post-' concepts should be taken with care, as Harvey (1989: 119) points out that there is a transition or change, that is, the state of the production system should lie somewhere in between the extremes of Fordism and flexible accumulation (Postfordism). In other words, the 'sea-change' should be viewed as a change in the form of the Gemeinschaft and production system, and thus the very nature of capitalism is still here yet withering away (Callinicos 1990, Castells 1989).

Nevertheless the global flexible production system has impacts on the locality, i.e. in the United States, among others. It is the restructuring of household economic activities that shifts to the informal sector, which has strong implications for (but not limited to local) politics, for example, the development of the 'quality of life' neighbourhood movement in Sunbelt cities, which is in fact anti- (or managed) growth oriented (26). This finding shares the peculiarity found in the New Social Movements across the Atlantic, particularly in the post-model Deutschland (German Model) era; namely, the quests for sustainable development and the restructuring of socio-spatial orders (27).

On the other hand, this fragmented, polycentric and much more complex (de)urbanization process (governed by industrial capital) assisted the city (as the center of the polity) in escaping from agglomeration of working class militancy, with the following results: the shifting of (class) politics in production sector to collective consumption struggles (28), and to politics of production (29). Do these contribute to or suggest the transition to another phase of, or the coming of another modernity (30)? Or, a disorganizing phase of capitalism?

For the logic of environmental-spatial development, the increasingly global flexible production process might also mean that national policies (via planning) try to attract such employment/capital related industries to specific urban areas which results in the changing of national standards or other environmental policies (31). For instance, the postmodern-architectural projects, which are often out of scale with the history of specific places, leading to the submersion of locality by superstar architecture that (bluntly) alters the planning law; this, at least, is the case with Helmut Jahn's architectural product in Philadelphia (32).

In this respect, the struggles for landuse -- as one of the environmental-spatial resources -- and other development control conflicts between the large corporation which supports the post-modern-architecture and the public will be intensified on the one end of the planning-politics trajectory, juxtaposing the calls for alternative policies for sustainable growth on the other. What

is significant here are the contradictions between capitalist production relations and production forces, between the production force and the conditions of production (i.e. environment) (33), that are mediated, still, by the planning mechanism that is subordinated under state and economic power. That is, the instrumentality of urban planning in the capitalist state's hegemony project, on the one hand (34), and the 'immovable paradox' against the social movements, on the other, should not be forgotten (35).

For the process of the development of the informational city, the search for higher productivity in the production sector for profit maximization and the appropriation of capital is coupled with the substantial change in the pattern of state intervention -- a shift from political legitimation and social redistribution (i.e. welfare provisions) to political domination and capital accumulation (supply-side macro economic management), juxtaposing the internationalization of all economic processes. Two particular characteristics of this development are notably mentioned, namely, (l) the new technology enables the increasing rate of profit and serves as a powerful instrument in sustaining the capital accumulation and domination functions of state intervention; (2) for the organization of production, there is a growing concentration of knowledge-generation and decision-making processes in high-level organizations, and a related flexible production process with decentralized networks (36).

More specific, the very nature of the new form of labor requirements for the new informational mode engenders a new set of uncertain or fragile concerns, e.g. the 'lifestyle' or 'quality of life' of the new professionals or middle class, which shapes the politicking process in which the state engages, on the one hand, and the 'back to private sphere' process that strives for better 'quality of life', on the other.

Thus the informational mode of development should be high-lighted: the space of and logic of flows, and the possible articulation of the (beyond class-based) New Social Movements (Castells 1988). More specific, it is the expanding development of services that has grown out of a variety of social mobilizations, mostly through protest movements and the related political concessions, on the one hand, and the organization of services that is shifting more towardsthe network of information and decision, on the other. Thus, the flows, rather than organizations become the units of work, decision, and output accounting. For the environmental-spatial process, what is crucial is the relationship between the process of the concentration of high level (e.g. decision-making) activities in the city-centre and the decentralization process of back offices and retail services to smaller areas (Castells 1989: 168-9).

One of the results is the rise of the new Dual City; the informational-based formal economy is juxtaposed by a down-graded labor-based informal economy resulting in a spatial structure, a city that combines segregation, diversity, and hierarchy (37), with the emergence of a suburban warfare state from an urban welfare- state with a shift of state intervention from the provision of collective consumption (e.g. housing and welfare services) to the promotion of new technologies that are, historically, military- oriented.

In actuality, this shift is related to the selective orientation of state programs which allocates resources to different localities following the technology hierarchy which has significant repercussions in environment and space. This technospatial selectivity of the related sectoral policy, say, the defense industry, is important in shaping the environmental-spatial process and the manifestation of problems.

After this synthetic snapshot of our discussions, a set of theoretical propositions for the understanding of the role of the state in context will be outlined.

2. Back to the Future? -- A Prologized Epilogue

Having discussed the particularity of the West German state form and the contextual changes in various arenas, this thesis ends with four propositions as summary remarks. Accordingly, they are concerned with the euphoria and uncertainty of state intervent on (2.1), the legacy of the New Social Movements (2.2), the concern for 'quality of life' (2.3), and the development of the local and global state (2.4). These propositions will further shed light on the contingent role (and limits) of the state in environmental-spatial process.

From Euphoria to Uncertainty

State intervention with scientific rational approach for socio-economic development had been praised for its success which was accompanied by euphoric feelings of the people regarding future prospect. However, as the state intervened into more new arenas than it previously had, the politicization of the related issues occurred synchronously which engendered more conflicts between the state, market and civil society, and that also revealed the limits and uncertainties of the state project.

At this particular juncture, the role of the state in organizing the society is being challenged not just by the traditional political activities, but also by the new protest movements which revealed the underlying predicaments of state intervention on the one hand, and the tragedies of state intervention, say, the limited available choice for citizens under the state's provision of collective consumption, which partly induced people to return to their private sphere, on the other.

In other words, for citizens the sense of euphoria for state intervention is withering away and is being replaced by a mix of uncertainties, queries, and challenges in increasingly fluid social encounters which expose the fragile relationship between state and civil society. Here, there are two important implications for what the future role of the state will be in the environmental and spatial process.

First, the increasingly fragile state - civil society relationship might reinforce the decoupling of these two subsystems in a possible collaborative effort to prevent the degradation of environment and space. The, capitalist state though it does not operate as a functional subsystem of the capitalist mode of production whose primary task is to create, maintain and restore the conditions for capital accumulation, the state, as it normally does, will tend to act according to its own logic that is not particularly oriented or sensitive towards the issues on environment and space. In other words, the state, for its survival in the world state (and economic) system, will try to formulate nation building strategy. In this instance, the state (and its policy) is the site of strategic dilemma and contradictions.

To be exact, the semi-autonomous structure of the state and civil society will act against each other to protect their respective relativity from each other. The articulated ideological messages of the non-institutional politicking versus the operation of the 'rule-and-order' of the state mechanism in the last two decades reveal the fact that the problems which both presumably aimed to eradicate in environment and space are becoming more problematic than ever. Conversely, the de-volution tendency in environment and space lies beyond the control of any societal/statist forces because of its structural independent position on the one hand, and the incompatibility of the coordination strategies of the societal and state sectors, on the other. Hence, the environmental-spatial process will likely be as uncertain as the state maneuvering.

The Legacy of the New Social Movements

The future role of the state in the environmental-spatial process is also influenced by the degree and the way in which the NSMs are being absorbed and consolidated in social and state sectors, or in what form the legacy of the Movements exerts its influence.

The significance of the NSMs rested upon the issue that had not been politically articulated in public sphere. For the NSMs mobilizing efforts, there is a need for an issue that is attractive and urgent; this is also the case for the state which looks for issue upon which its legitimacy could be anchored. The environmental and spatial issue, by virtue of its unpredictable nature related to the calculation of (unknown) future events could thus be used as the locale where the state continues to rule. If this happened, the NSMs will die down as there are no more issues for them to exploit nor articulate (38).

Therefore, it is not surprising the both the New Social Movements and the state have tried to take up the ecological issue. In reality, the formation of the federal ministry for the environment in West Germany and the related environmental programme in the early 1970s -- even earlier than the full-fledged development of the Ecological Movement -- illustrates the point that green issues are not monopolized by the Movements. In fact, both the state and the Movements compete for the workable issues.

Worth noting is that on the way to search for workable green issues, the fluid nature of the movements might be an unconscious instrument to be used by the neo-conservative for the promotion of a privatization programme, that ends up in the return to the uncontrollable market mechanism, that is, the exploitation of people, environment and space (39).

Moreover, no two issues are identical. Some issues might even have a detrimental effect on the development of the movements, for example, the problematic formation of the 'anti-party party' of "Die Grünen" which generates more internal struggles within the party than between the party and the state. For instance, one crucial and also interesting aspect of it could be seen by the polemic statement of Rudolf Bahro (1986) when he resigned from the Green party in the mid 1980s.

Nevertheless, in West Germany, the electoral rule in general, the Five-Percent-Hurdle -- and the related reimbursement of election expenses of those parties which could reach this hurdle -- and the free broadcasting time enjoyed by a party during election in particular have restored some

form of unity within the pluralist (sometimes conflicting) Green party. Furthermore, the ideological cleavage between the conventional parties and the Greens was comparatively greater which enabled the conflicts between the "Fundis" and "Realos" (vis-a-vis other political camps) to be reconciled within the party. However, as time passes, the difference between Die Grünen and other political parties is not so sharp as the internal conflicts within the former party.

Historically, the Greens also took advantage of the fact that the governing leftist party (SPD) was unable to retain the loyalty of those committed to new civic action and environmental issues (Wilson 1990: 79). However, the recent Bundestag Election reveals the reversing trend, that is, the SPD took a large proportion of the support which previously belonged to the Greens as it put forward an environment-related political platform.

In short, it should be remembered that some peculiarities and the identity of the Greens have been eroded under the 'new' rules of the game (as compared to the movements per se): "they have been compromised, questioned, or silently dropped from the practice of Green parliamentary politics" (Offe 1990: 244) on the one hand, and the conflicts between the members of the Greens and its parliamentary party, on the other (40).

The Concerns for New Quality of Life

It is ironic that technological development has led to the concerns about 'quality of life' that, as articulated in the protests, act against the interest of further technological development. Corresponding with this development, it is the change of value orientation and lifestyles which shapes the arena in which the state mediates the conflicting claims for economic development and environmental conservation. In particular, the concerns for global (as well as individual) survival in general and environmental (living) quality in particular -- after recognizing the fact that there are limits to growth -- have high- lighted the importance of local (individual) actions and their coordination for sustainable growth (self-satisfaction) (41).

The new concern for 'quality of life' has two dimensions, namely, (l) one's satisfaction as derived from consumption, (2) the global question of sustainable development. The co-existence of these (sometimes contradictory) two dimensions has made the consumption pattern more symbolic than substantial; that is, people concern themselves more with the form and way of consumption and how to utilize the remaining resources -- the Commons -- for one's pleasure, rather than putting emphasis on lifestyle for substantial environmental protection. Thus it could be argued that the new concerns are more superficial and differentiated than was once believed.

The likely phenomenon that people return to private sphere for one's pleasure might be, rightly or wrongly, due to the rational calculation of people in the dilemma (crisis) situation -- the threat of the global environmental degradation. To maximize the individual gains, s/he might choose to act at the expense of the Commons (42). The phenonmenon: recent increase of mass consumption on high-tech consumers goods, such as CD-player and satellite antenna, and the home-work with computer for profits, might support the premise that people retreat from public domain (politicking is subsumed in this dimension) and the concern for global issues, politically.

On the other hand, the activists believe in alternative courses and the related preventive measures for environmental conservation that could foster sustainable development. They articulate their claim through their 'negation' of the dominant trend of the large scale infrastructure, e.g. dams, airports, and highways, or mass production-consumption praxis. In actuality, they are searching for a 'post-capitalist', 'post-socialist' lifestyle, you might call it an eco-socialist way of living.

Interestingly, it may be justifiable that the state also tried to adopt the 'green' way of operation that adhered to the new waves of the societal concerns. However, its course is still much dependent upon the overall functioning of the production sector. For instance, despite the claim for the building of a 'green' airport in München (Wähner 1990), the impacts of the airport on the environment have been irreversible and permanent. The planners could no longer reverse the damage. Thus the questions on technology, environment, and quality of life, which reflect this form of environmental-spatial process are yet to be resolved.

After decades of the up and down of protest movements and the stop-and-go of the state projects on environment and space, it is fair to say that the monetary and socio-environmental costs have been paid for 'development' projects, however, the prescribed and expected benefits are not yet to be realized.

The Local State or Global Organisation

The state is becoming more differentiated in terms of its structure and functions which are inter-realted with market forces. In particular, the new form of state organization -- QUANGO and the related policies, deregulation for example -- pursues its course of action with reference to market operation, that is, profit maximization and efficiency.

This development, coupled with the increasing bureaucratization of politics, will likely lead to an administration-oriented political intermediation that lessens the importance of citizens' politics. An example of this is the withering away of the local state with a corresponding expansion of the scope of the quasi-state structure (43). But the control of the new state structure on environment and space is very limited, juxtaposing the increasing fluid societal interaction pattern and the logic of flows in the informational society.

On the other hand, the development of supra-national organization -- say, the European Communities, which is assuming more and more nation state's jurisdiction -- is an important variable that will influence the role of the nation state in managing the environmental - spatial process and related problems. To which extent will this 'unification' process which shapes the sustainability of the future environment is still unknown. Nevertheless, the change will not be anything of incrementalism because the new (supra-) state structure is more influential than the New Politics which had once altered some political contours of our contemporary society.

To conclude, the state (-in-context) will still subect to various socio-eco-economic forces within and increasingly those beyond the nation boundary, and thus it continues to be the mobile locale of strategic dilemma and contradiction; the related politics in environment-space is still a contingent necessity to sustainable development.

Notes

(1) The peculiarity of the Modernity should be noted that "most modern writers have recognized that the only secure thing about modernity is its insecurity ... Modernity, therefore, not only entails a ruthless break with any or all preceding historical conditions, but is characterized by a neverending process of internal ruptures and fragmentations within itself." (Harvey 1989: 11-12).
(2) Syndrome here is used to denote the complexity of related issues and problems and mean the syndrome in medical model. The syndrome here mediates risks between technology and environment, naturally, as argued in Douglas and Wildavky (1982), Douglas (1985) that the risk has cultural and anthropological significance.
(3) Cf. Beck (1987a). The discussion on the change of technology and its ramification on socio-spatial ordering, see Castells (1989: Ch.l), Lai (1991: Ch.3).
(4) See Kunreuther and Ley (1982), Kunreuther and Linnerooth (et al. 1983), Morone and Woodhouse (1986), for discussion. For the management of risks in the public sphere, see Gow & Otway (1990)
(5) For the study on the extent of the influence of mass media, newspaper in particular, in shaping the risk-communication, see Stallings (1990), Gow & Otway (1990)
(6) Following the arguments of Alan Touraine (1981) and Hegedus (1989) which emphasize the emancipatory function of and the positive, if not romantic, aspect of the New Social Movements -- the ideal of the modernity project -- that shape the new constellation of social relations.
(7) Science used here denotes a sense of its hegemony over the community (Gemeinschaft), or in Habermasian terms: the colonization of the life-world.
(8) The related questions and problems of risk assessment, as discussed, are more problematic than what it intended to solve. It is suggested that its validity should be forgotten, rather, cautions should be used with reference to its findings, however.
(9) This is argued by O'Connor (1988, cf.1987).
(10) Cf. Cohen (1983), Dalton (1988), Hegedus (1989), Inglehart (1990: 371-392), Offe (1983, 1985a).
(11) Cf. Catell (1977), Harvey (1979), Offe (1983, 1984).
(12) Another controversial aspect of these phenomena, ironically, is the reproduction of risk in genetic engineering, hazardous and defense indutries that is supported by state and quasi-state organizations, see Conrad (1987), Catells (1989), Clare (1989).
(13) Regarding this assertion, see Beck (1986, 1987a) and Luhmann (1986). An alternative explanation might be that communication failure and organizational dysfunction are two of the causes of Chernobyl, Bhopal and other disasters, and the tragedies that followed. For this point, refer to International Conference of Free Trade Union (ICFTU) an International Federation of Chemical, Energy and General Workers Unions (ICBF, 1988), Bogard (1989), Medvedev (1990).
(14) Harvey (1989: 111) concludes that the turn to postmodernism does not reflect any fundamental change of social condition." That is, the change only reflects a shift in the way in which capitalism is working. A similar argument, referring to the emergence of the informational mode of development, is also made by Castells (1989: Ch.l). An alternative formulation that is against the potmodernist one, see Callinicos (1990).
(15) For elaboration, see Nelucci (1989) and Scott (1990).
(16) See Castells (1983), Cohen (1983) for discussions.
(17) Cf. Inglehart (1990: 378-85), Offe (1985a/b)
(18) Cf. Castells (1985, 1989), Batty (1989, 1990a/b).

(19) See Cohen (1983) and Hegedus (op cit).
(20) A phase succinctly used by N. Brabury (1983: 23).
(21) See Hegedus (1989) for elaboration on the transnational movements that have an underlying meaning for the project of there is only) one World. Also, cf. World Commission on Economic development (WCED 1987).
(22) Cf. Castells (1983a: section III), Melucci 1989), Milbrath 1989), Naess 1989), Inglehart 1990).
(23) Cf. Scott 1988), Boyer 1990), Lipietz 1986).
(24) Refer to the discourse on postmodernity, in Howe 1959), and Berman 1982), Harvey (1989), Cooke (1990).
(25) Cf. Offe (19858), Lash and Urry (1987).
(26) See Smith (1988: 217-22). For a review on the globalized impacts on the locality, see Smith and Feagin (eds. 1987), Soja (1989, Ch.8,9), Cooke (1990).
(27) Cf. Esser and Hirsch (1989), Frankland (1989), Poguntke (1989), Rüdig (1988).
(28) Cf. Castells (1977, 1983), Dunleavy (1980).
(29) See Offe (1983J 1985) Gerlach (1986) Conrad (1987).
(30) Cf. Habermas (1985), Soja (1989: 127-189).
(31) See Button and Peace 1989: 153). For a discussion on the impact of globalized development, see Smith & Feagan (ed. 1987).
(32) Zukin (1988: 40, 43 note 3), see also Cooke (1990).
(33) For a succinct formulation on the dialectics of the conditions of production see James O'Connor (1988).
(34) Harvey 1989: 222-223), also, cf. Jessop 1983).
(35) Concerning the paradox, Harvey (1989:238) notes that " not only does the community of money, coupled with rationalized space and time, define them in an oppositional sense, but the [social] movements have to confront the question of value and its expression of space and time appropriate to their own reproduction. In doing so, they necessarily open themselves to the dissolving power of money as well as to the shifting definitions of space and time arrived at through the dynamics of capital circulation. Capital, in short, continues to dominate ..." [Sic].
(36) This follows the Castells' argument 1989). It is argued (ibid, Ch.1) that technology is the nexus established between labor and other variables in the production process, and knowledge -- the very nature of technology -- and its mobilization and accessibility have become the key source of productivity upon which a new mode of development is based. More important, it is the flows and networking of knowledge and technology that likely shape the socio-political discourses.
(37) A critique on the notion of Dual City, see Marcuse (1989).
(38) The recent socio-economic development in a unified Germany seemingly suggests that environmental issues are no longer strategic for the state (hegemonic) project.
(39) See Kreuder & Loewy Hrsg. 1987) for discussions on the return of (neo-)Conservatism on socio-politics in West Germany in the 1980s,
(40) Not only to be observed at federal level, conflicts or at least inconsistence between those inside and outide the parliament could be seen as (three) members of Greens in the West Berlin Senat refused to support the motion for a non-confidence vote on the SPD led Senat, after the outbreak of violence between police and the house-occupiers in East Berlin.
Cf. Franfurter Rundschau 15 November 1990).
(41) Cf. Meadow et al. 1972), WCED 1987), McCormick 1989).
(42) See the insightful discussion of Goodin (1976).

(43) See BMWi (1991: 44-6) for the proposal for privatisation of quasi-state agencies in Germany.

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practice of introduction of democratic rules in post-communist reality. Then we will learn more about future of urban and sustainable development.

1. Psychological Barriers: Good Will Versus Professional Skills

New political environment created after political earthquake in the former communist countries, has great potential to support not only building of new democratic structures, but also to work out new strategies for socio-economic development. However, the starting point is not favorable for systematic, comprehensive, and pragmatic activity (Przeworski, 1991).

After decades of communist regime societies from post-communist countries have lost abilities to self-organization, demanding attitudes are prevailing and there is no room for realistic evaluation of contemporary situation (Jalowiecki, 1990).

Logical analysis of existing resources and possibilities has been replaced by wishful thinking about future. During the first phase of changes politicians using slogans like: democracy, bright future, freedom, welfare, march to Europe etc., even reinforced magic thinking about real life. Avoiding discussions about economic and social costs of transformation, they created artificial world, where words could do job for people. This strategy was understandable that time. Sharp political struggle imposed specific types of political behaviour and propaganda. Now the time of declarations and promises is over.

Euphory and optimism charateristic for the first period of anti-communist revolution have been replaced by disappointment, resulted from the limited possibilities of solving huge bunch of problems inherited from communist system. However, output of the first steps of economic reforms (unemployment, increasing level of poverty, lack of social security) are not commonly perceived as costs of reforms, but as results of mistakes made by new governments. Division between society ("we") and government/authority ("they") turned out to be rooted very deeply. Tough conditions of every day life and unclear economic future make people even more suspicious. In this social context task to mobilize human resources is extremely difficult (Jalowiecki, Swianiewicz, 1991).

In addition new political elites, especially on regional and local level, consist to large extent of politicians - amateurs. They are trying to bear with sophisticated, important in national dimension problems, using technics of solving specific, the most urgent issues. However, these issues are very often important only for specific professional groups or territories. Looking for social support politicians act to satisfy needs of people, who may vote for them during next election. This way of behaviour does not lead to comprehensive improvement of economic and social situation (Grochowski, 1991).

Lack of mechanism of efficient transfer of political declaration to economic sphere is a result of "wishful thinking" approach. To change existing situation new model of politician and manager must be adopted. New people should be prepared not only to be "against", but also to be "for"; to be able to build and create, not to destroy. This issue seems to be crucial for next months and remote future. Long-term, innovative approach is needed urgently. Only people, who are not interested in extemporaneous effects might ensure conditions for deep, structural changes. Thus,

the most important task is to create new elites, which would change entirely the way of thinking about principles of development and measures of new policy implementation. People with good will have done their job. Now it is time for professionals, who may give new incentives for development.

Refering this question to the problem of cities one may state, that only comprehensive approach gives chances for their future. Still popular opinions that problems of cities can be solved separately, without structural changes of national economy is very naive. New groups of leaders must consist of people - professionals aware of this fact. For them ideology of development should be reduced to the set of rules, which help to work out rational plan, which may facilitate processes of planning and plans' implementation.

Four main barriers to be overcome can be distinguised: 1) barrier of social apathy, which does not allow people to be involved in the process of reforms; 2) barrier of "magic thinking", which makes people ready to believe in easy and harmless solutions; 3) barrier of traditional thinking about blessing power of industrial development; 4) barrier of environmental awareness, which makes people to believe, that we still have time to improve conditions of natural environment, and we can use its resources as we did in the past to fulfill our needs, without dangerous global consequences.

Barriers listed above should be supplemented by two additional related to politics: barrier of political interestes, which influence programmes of economic development, aimed on immediate results not long-term profits; and barrier of social needs and expectations, which may reduce rationality of undertaken measures.

2. Regional Diversification and Differences Between Urban and Rural Areas

In post-communist countries strong differentiation in terms of standard of living between rural and urban areas is observed. Regional differentiation of this phenomenon is even more noticeable. This is one of the reasons, that migration flow from rural to urban areas within one region and from rural to industrialized regions has been relatively high. Urban areas still remain very attractive, although according to Western standards they do not provide proper environment to live there (Bachtler, 1991).

To solve question of new strategy for development of cities new policy of regional development must be worked out. To learn about chances for such a policy new leaders should answer two questions:

1) Should they try to reduce differences concerning level of economic development between specific regions?

2) Should they concentrate efforts on finding original solutions, which may lead to new relations between rural and urban areas within specific regions?

If the answer for the first question is positive, they are deciding about continuation of negative, in long-term perspective, trends which were introduced to the economic of former communist countries after World War II.

If they agree, that the second option is right, then one have a chance to create model-like solution, which might be disseminated to other regions.

To avoid creation of mechanism, which would copy undesirable solutions from the past, new approach to regional policy must emphasize the fact, that cities are not isolated islands, but parts of socio-economic system. Thus, for used resources they should repay surrounding areas. In other case it will not be possible to reverse trends of migration, and economic and social deterioration of areas located in the shadow of cities would be increasing. At the same time cities would be growing as defective growth poles of national economy.

3. Sustainable Development and Economic Growth Trends

Political division between East and West is becoming less important. Generally friendly attitude of the West towards newly born democracies gives good perspectives for political integration. Although economic aspects of the integration are still very disputable, one may believe, that post-communist countries would find their place, sooner or later, in European Community (Hill, Zielonka, 1990).

Free flow of information helps to overcome stereotypes and prejudice. However, at the same time it may also create new problems. After many years of isolation people from post-communist countries of low level of economic development are exposed to Western models of behaviour and consumption. It leads to eruption of needs and stimulate huge demand for new goods, services etc. Natural reaction of these societies is to use Western ways of development to reach Western standards of life. There is a lack of criticism and objective evaluation of Western experiences. Market is perceived to be universal driving force of the healthy economy.

There are two main obstacles to introduce the idea of sustainable development in post-communist countries. The first one is, that these countries first of all must survive in economic terms. Rapid change of the structure of economy and technologies is not possible due to simple financial (foreign debt, lack of domestic capital) and technical reasons (process of privatisation is under way, time is needed to introduce new technologies). The second obstacle is the social situation. Paradoxically: From one hand these countries need time to introduce necessary changes, from the other hand they do not have time, because resources of social patience is running out. To avoid social unrests and protests which might paralyse the whole process of democratic reforms, governments have to find a "state of balance", a situation, when some solution can be shifted in time, while the others would be introduced at once.

It seems, that in order to change the path of development post-communist countries must reach specific "turning point" - situation which provides enough room for manoeuvre. Unfortunately, this "turning point" could not be reached unless the most urgent needs are fulfilled. It means, that environmental costs would be perceived for the next several years to be less important, and

economic efficiency will be the main criterion of evaluation. Thus, cities would be treated as instruments and subjects which may help economy to fight deep recession.

4. New Ecological Policy and Economic Efficiency

The extremely poor conditions of natural environment result from the ideological principles adopted by communists. The so called free natural resources had been used excessively for years. The primacy of economic growth and industrial production over development according to values of natural environment, has brought ecological disaster in many regions in post-communist countries. The ecological conditions in cities, not only the centers of industry, are especially bad. The gap between technology of life in Western cities and in post-communist countries is enormous. Although, as was mentioned above, an improvement of the situation in cities depends on changes in a broader, regional and national context, cities may serve as a good starting point for these changes.

The concentration of production and consumption in cities is the reason that even small changes in their functionning may bring large scale results. One may state, that on this stage of development an active protection of natural resources can and should take place in cities. In this case, the postulate of new ecological policy would bring measurable economic results. These results might have important psychological meaning both for society and those who make decisions.

5. Economic Reforms and Political Reforms

There is no doubt that the most important and urgent issues in the processes of reforms in post-communist countries are these of economic character. Achievements of newly elected authorities are strongly critized. The selective memory of post-communist societies and the very energetic activity of the followers of the former regime cause that positive opinions about the communist government are being articulated. New social and economic conditions are unacceptable for many people. It results from the main political mistake made by non-communist governments: comprehensive and honest reports about conditions of the economy and society inherited from communists were not prepared.

In societies where people in power are usually perceived to be brought from "outside", new authorities are being accused of all failures in the reform processes and the decreasing level of life. Thus, the room for political manoeuvre is becoming smaller (Grochowski, Kowalczyk, 1991). This general political phenomenon is very dangerous for the future development of democracy. However, cities may again play an important role. Political elites are concentrated in cities, and the main political parties have the strongest social base in cities. Thus, efforts to improve the economic situation and political atmosphere can find a common platform, and it will not be necessary to formulate and find solutions for the dillema: Economic reforms versus political reforms. In the broad national context, cities may become engines moving forward the whole system. If the process is started, then policy can be modified to include other areas and execute the mechanism of collaboration.

The time we have to reach the first positive results of reforms is crucial for getting social support for further reforms. Any delay would have very serious consequences and impede the process which should lead to sustainable development.

6. Local Democracy Development and Social Participation

The eruption of democracy has revealed the immense variety of interests of specific social groups. After a time of one political party domination, new political and social movements have appeared on the political scene. They articulate interests of specific, sometimes very small, social groups.

There are three main types of social groups. They might be distinguished according to the following criteria: professional background, political affiliation, territorial location. It must be emphasized that these criteria should be used separately.

After almost five decades of communist regime, the social structure in the post-communist countries is amorphous. Its important elements were destroyed except family's structure on the bottom, and a powerful organisation with strong social support - the catholic church, on the top. The elements of social structure "from the middle" are very labile. They remind clusters of accidental people. It is not easy to define social identity of these groups. Because of these facts not only political future is hardly predictable, but are also a possible social reaction for new economic and social policy.

In processes of democracy development, special attention should be paid to the question of local democracy. The mechanism of social participation must be worked out very carefully. The new governments must do an immense job to convince the people, that an improvement of their specific situation without giving any attention to national/global costs of changes is not possible and acceptable. Every step, goal, and measure should be related to much broader contexts. Only in this case a proper social background for sustainable development would have a chance to be built.

7. Local and Regional Development Versus Harmony of Socio-Economic Development

An extremely high level of centralisation of political and economic life was characteristic for the communist system. The idea of democracy might be implemented only in case when the decentralisation concept is a new principle of development. A deep decentralisation of power, competences and responsibilities is needed. The process of decentralisation has just been started through free elections. The political decentralisation is strongly advanced. However, it does not mean that power, competences and responsibilities have been shifted from the center. This is merely beginning of new organisation of the states, which should provide proper political environment for future changes (Grochowski, Kowalczyk, in print).

There are some barriers which impede creation of this environment. The most important one is an economic barrier. The decreasing national income brings a tough situation both on national as

well as on regional and local scale. Some areas have a stronger potential and more chances for an economic acceleration. Then a new situation is possible, when the regional differentiation of the level of development (including the situation of the cities) would be increasing and lasting for a long time. A political decision should be taken to decide if such a solution is acceptable. This decision would have a crucial importance for future activities. If we accept the idea of "social Darwinism", then we probably would set new barriers, which may seriously reduce our strategic choice in the future. To avoid this problem, an equal importance should be ascribed to local, regional and national economic systems. The rule of equal importance should shape relations between them. It may enable and facilitate harmony of a socio-economic development and act against the creation of regions in depression and dying cities.

8. The Role of the State: Decentralisation of Power Versus Decentralisation of Responsibilities

Liberal concepts bring, among others, the idea of self-suffiency. People are supposed to be tough how to catch a fish, not simply to get a fish. The state as an institution providing goods, services etc., and taking care of the citizens is losing its functions and dominant role.
The concepts of regions in the united Europe are even reinforcing this process. Links between the regions in post-communist countries have always been rather week. It is because these countries used to function according to a sectoral not to a territorial model of economy. It brought an over-concentration of industry and an industrial mono-structure in many regions. A centralized management and the expansion of heavy industry put them in a very difficult situation. Without a state intervention, their chances for an economic restructuring are problematic. The new policy makes people - local/regional authorities responsible for results of macro economic solutions, not giving them power (institutional, financial) to decide about themselves on regional/local level at the same time. A further decentralisation should change the contemporary situation. However, although the concept of strong central authorities is not popular in the post-communist countries any more, one should state, that the role of the central government is now even more important than it was in the past. The central government must play the role of a supervisor and moderator in the reform processes to avoid regional conflicts and to ensure an efficient cooperation between local, regional and national systems (Grochowski, in print). In the other case, some of them would function as "spongers", using resources and paying back with spatial disorder, social conflicts, pollution etc..

9. Incorporation into the System of World Economy

The communist countries had been isolated for years in terms of political and economic cooperation with the West. The last two years have changed these relations entirely. The freedom of choice does not only concern specific partners (country, region, firm etc.), but also the principles, the future development would be based on. In this context, an important question arises: does the freedom of choice really mean that these countries are gaining power to manage the current and future problems? The answer is not easy. From one hand it seems that the strong will to be a member of the group of well-developed countries imposes policies which are aimed to fulfill expectations of international monetary institutions or trans-national corporations and banks which may give financial support to necessary reforms. From the other hand it is obvious

that without support from outside these countries do not have any chances for success, and undertaken measures simply result from an objective evaluation of the reality.

Dreams about market economy, wealthy society and strong national economy are shared both by governments and societies. These dreams are being slowly introduced in the practice of life. The dangerous aspects of this process is, that to reach Western standards traditional Western methods are used. It makes the post-communist countries more and more dependent on Western technologies and their way of development. There is not enough criticism concerning the results of solutions implemented in Western countries. Thus, there is a threat that the same mistakes would be made and the same negative results would be obtained.
Nobody calculated the real costs of an economic union with the EEC countries and of an adoption of Western standards concerning economic efficiency in different branches of national economy. Negative experiences have not been analysed. The attractiveness of the access to new markets and technologies covers a sophisticated variety of costs, which would have to be paid for the integration with the EEC.
The possible flows of capital, goods and ideas may bring both positive and negative effects. The question is how to cooperate with the West in order to avoid economic colonization of the post-communist countries. The answer to this question depends to a large extent on all participants of the game, which should remember of global and long-term consequences of their policies.

10. Economic Reforms Versus Reforms of Spatial Economy

The process of transformation from the centrally planned socialist economy towards market economy has never been experienced. Without any doubt this is the biggest social, political and economic experiment and the greatest challenge in the history of the post-communist countries.

There is no pattern which may suggest, what should be done to move towards a new system without social and economic disaster. This is why the trial-error method is used so often.
The specific conditions existing in the different post-communist countries do not allow an import of solutions which work under the conditions of other countries. The starting point, in terms of the level of economic development, for reforms varies from country to country. It influences the path of reforms which have been chosen. One common feature for all post-communist countries in the importance of the economic dimension of the reforms. All these countries must first of all survive, and obviously the costs of survival are not perceived in an objective way. That is why the elements of natural environment and the values of space are not always present in plans and strategies. The spatial chaos is becoming deeper and the chances for spatial order are shifting in time. This is a serious mistake, which may have long-term implications for spatial economy (Kolodziejski, 1991).

11. Conclusions

In post-communist countries a dynamic game for new structures of society, economy and state is observed. The game takes place in entirely new internal and external conditions. Although the political situation is still not stabel and hardly predictable, new actors - new political elites and

new rules of the game assure that a return to old communist reality is not possible (Hankiss, 1990).

The process of reforms would last much longer than optimists believed some months ago. However, using an objective perspective of evaluation one may find not only bad, but also good news. Democratic reforms have been started and real conditions of economy, society and environment have been revealed. These facts are very important. Honest diagnosis and awareness that there is no way back should help to mobilize human potential. Bad news is that the new authorities would work under permanent stress, because of the many problems which have to be solved immediately. I may force the authorities to choose "easy solutions" - these which make people happy for the time being. Although the first anti-communist revolution is still not completed, post-communist countries need a new one. The results of this revolution should bring a new thinking about development, environment, cities and urbanized areas. In other case they would become distorted copies of Western countries.

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SUSTAINABLE DEVELOPMENT AND THE FUTURE OF POLISH CITIES. A PRELIMINARY ANALYSIS OF A CASE STUDY

Ewa Jurczynska

Introduction

This paper deals with an analysis of the findings of social research which I carried out from April until July 1991 in four large Polish cities on local activities towards the solution of local community problems and on local political leaders' preferences and fights for power.

Although this research was based on case studies, I took into account a wide scope of the macroeconomic determinants as well as local, social and economic determinants to give an up-to-date image of economic changes and their social consequences. The research was carried out as a part of the international research program "Fiscal Austerity and Urban Innovation Project", coordinated by Professor Terry Nichols Clark from the University of Chicago, Ill., U.S.A.

The assumption which I have accepted from the sociological literature is that local political leaders and elected officials play a key role at the time of economic and social changes. It refers not only to the strategies which are undertaken by local goverments officials, but also to their social and political preferences and their value systems. In relation to the specific problems of the systemic economic transformation from socialist to market economy, one ought to take into account the legal and financial conditions which are formed by central state administrative bureaucracy as well as by the parliament. These conditions can widen or restrict the power of local government to do the best for the solution of local problems. The economic and social results of the transformation to a market economy depend also on the economic and social characteristics of a city or region as well as on a central bureaucracy vision of the functions of a city or region. However, new groups of interests could emerge in some regions to fight for more autonomy and regionalization.

These assumptions were tested in four large cities: Katowice in the Silesian Industrial Region, Poznan in the Greater Poland Region, Cracow in the Little Poland Region and Lodz in the Central Industrial Region.

The methodological aim of the research was to test the usefulness of the international "Fiscal Austerity and Urban Innovation" questionnaire in the specific situation of Poland. I extended this questionnaire to cover additional issues as: the value system, the materialist-postmaterialist issues, the range of local officials and political leaders activities with respect to city's problems, the recruitment and type of political carreers, and political preferences of local officials and leaders.

Since this paper presents only a preliminary analysis of the obtained findings one can find here an overview rather than more detailed descriptions of the problems under analysis.

1. The Macroeconomic Context of the Economic and Social Transformation in Poland in 1990 and 1991

One should remember that nearly 80 per cent of the Polish economy is presently state-owned. In November 1989 the first non-communist government under T. Mazowiecki came into power and, in January 1990, introduced a hard fiscal/monetary Economic Stabilization Project. This project has been designed in collaboration with International Monetary Fund advisers. The main goals of this project have been: lowering of the high rate of inflation; forcing the state enterprise managements to look for an innovative restructuralization of technology, production and management. But at the same time, the central government decided to establish high interest rates for bank credits (in 1990, the average interest rate was 60 - 70 per cent, in 1991 it was some 50 per cent) for the state enterprises and private investors, and also to implement a high rate of income taxation on the state workers earnings (in industry as well as in non-industrial state-owned branches such as education and health). This taxation caused not only a deep decrease of real income for the majority of the labor force, but also a deep decline of demand for consumption goods in the population. The situation in turn has caused a growing recession of production in nearly all industries.

Such quick implementation of a radical monetary/fiscal project without good and preliminary preparation of the top managers of the state enterprises has caused unexpected troubles and disturbances. Neither the top managers nor the average workers (or their unions) could find appropriate solutions to such new conditions as implemented by the central bureaucracy (the Ministry of Finance) in a short time, even if inflation has been pushed down. A lack of capacity on the side of the managers to adapt immediately to new market demands and drastic financial

by the development of the private productive sector (very slow) nor by foreign consumption goods inflow (a growth of private trade sector but without an appropriate taxation).

This situation has caused not only the uncontrolled growth of unemployment but also the drastic cuts in personal and family incomes - 40 per cent during one and a half years since the implementation of this monetary project. Simultaneously the central government increased the prices for energy and transportation which led to an increase of the prices of all consumption goods up to the world prices. The inflation rate has declined, but in 1991 will be more than 80 per cent any-way. The average salaries have been "locked-up" and established at the level of 150 Dollars per month for nearly 80 per cent of all employees, and 67 Dollars for unemployed; at the same time, profits in the private sector multiplied by 5 - 10 times. Such low average personal and family incomes maintain a situation of pauperization for the majority of a society and results in strong protests against such central government policies.

The growing division between rich people, especially those who make big money in speculative or illegal ways (10 - 15 per cent of a total labor force) and the pauperized rest of the society (80 per cent) causes strong frustration and the demand for a change of the central government: This will be the first decision after the new parliamentary election in October 1991. The assumption that the building of a market economy and the formation of new capitalist middle class in the short cut way is possible became a dangerous myth for the future changes in economy and society.

Of course some of the bankrupt state firms made intensive efforts to find foreign investors or buyer to exist in the future. Nevertheless, the privatization of a national economy is a long term process and its positive effects for the whole of society, not only for a narrow group of Polish or

Such deep recession and decline of relatively modern industries is the result not only of the inability of top managers of the state firms to adapt quickly to competitive conditions of the market, but also the result of wrong central government decisions to establish drastic taxation of these firms which blocked the possibilities for restructuralization.

Also, an uncontrolled opening of Polish frontiers for inflowing foreign consumer goods has caused a blockade of agricultural production. Such an opening of frontiers has been more a political than a conscious economic decision. The new government had to show that the society is able to eliminate the shortage economy in a short time, and then to gain support for the drastic changes in the economy and for the decline of social welfare. Such wide opening of frontiers to an inflow of foreign consumption goods does not support the proper transformation of the national economy but rather its destruction.

Only recently, in August 1991, the second non-communist government has taken a decision to create a new governmental agenda for the restructuralization of some industrial sectors and to engage European Community experts to find solutions.

The decay of industry has caused, of course, fast and uncontrolled growth of unemployment - 2 million people in two years. Nobody has expected such dramatic results from the implementation of this economic program. One of the foreign governmental advisers called this program a "creative destruction", but can a destruction be creative in reality? If one adds completely unprepared bank and financial institutions for an operation under new economic conditions, one should not be surprised that the adaptation to new economic conditions was nearly impossible for the majority of the state firms at this short time. One can assume that such fast "speeding up" of the introduction of market capitalist conditions and competition against foreign production is not the best way for the change of a national economy. A reforming through destruction, even if in 10 - 15 years economic growth can be achieved as it has happened in Chile, will bring too high social costs. An economy should not be seen as the only goal of systemic transformation. A society should not treated only as an object of experiment or manipulation.

In early 1991, the second non-communist government under K. Bielecki has made efforts to modify the transformation of national economy through faster privatization and the sale of the state enterprises. Nevertheless, such fast privatization of the national economy causes corruption and financial scandals. It results not only in lower market prices for state firms but also in breaking down bank rules, as in the last bank financial scandal in August 1991.

The introduction of a capitalist market economy in a short cut way does not yet bring so much positive results as some people have expected. Ineffective restructuralizative policies of the central government and the transfer of such decisions to the hands of foreign capital can bring the loss of sovereignity of the Polish state. At the same time, the Ministry of Labour has declared that in the face of breakdown of the state budget it was impossible to prepare a wide program against unemployment. It means the loss of the states' responsibility for social justice and the emergence of "wild capitalism" in the 19th century manner. It can mean that not only further economic transformation is in danger, but also the development of political democracy, at the national as well as at the local levels. Too little room is left to local authorities to look for a solution of these problems. This situation causes a strong pressure from the more active people in some regions to faster decentralization and to more autonomous economic decisions. This has

become visible in such regions as Silesia, Greater Poland and Little Poland (see more details below).

2. The Political Context of Economic Transformation at the Local and Regional Levels

The real collapse of the communist system in 1989, after the first free parliamentary election, and the political power taken by new political elites from "Solidarity", has brought about the fast exchange of political elites in the entire power structure. In May 1990, the first democratic self-government election at the local level has been undertaken. But at the same time the worsening of living conditions of many people and social groups has caused a very high electoral absence, with a turnout of only 46 per cent. This situation resulted in fierce struggles among many local leaders for power and the creation of new political structures and parties at the local as well as at the national levels. This situation is likely to repeat in the nearest parliamentary election in October 1991.

As the result of self-governmental elections at the local level, a hitherto unified movement as "Solidarity" became split up. The main social organizations which promoted candidates for local offices were "Civic Committees", based on the post-solidarity connections among local leaders. Such personal connections formed different political orientations and different political groups. It is well known regularly that at the first stage of the formation of a local democratic system fragmented political elites have appear. It depends on the specific local characteristics.

However, the main political and social orientations have deveoped as a reflection of the political division among central structures of power and central post-solidarity elites. The first non-communist government has been created by people whose political orientations have been a mixture of right-centre (in economy) and left-centre (in social issues) opinions. Although not extreme, the political orientation of the second non-communist government is much more rightist in economy as well as in social issues. However, the neo-liberal doctrine which is now realized in the Polish economy forces much more fiscal and social conservatism. It can be compared with the conservative right parties in Western Europe in the 1950s.

The formation of new political parties and their political orientations are very closely connected with the issue of a strategy for economic transformation, not only at the national but also at the local levels.

At present, the main decisions about economic changes are taken by the central bureaucracy - the Ministry of Finance, the Ministry of Property Transformation, the Agenda for Foreign Investments.

This centralist method of economic transformation causes negative effects for local level industry as it appears in Lodz and Starachowice. Post-communist centralism in the decision-making about the future of state enterprises does not bring positive effects for the future development of all the different regions and cities. It has caused strong protest among the most active people in some regions and influenced the formation of new pressure groups (lobbies) - e.g., the unions of regionalists in such regions as Silesia and Greater Poland.

Already in the 1990 local elections in these regions, the unions of regionalists promoted their respective partisans as candidates for local governments. For example in Katowice 55 per cent of the new local officials were elected from among the Upper Silesian Union, in Poznan 30 per cent of the local government are the members of the Greater Poland Union. Especially in the Greater Poland Region the regionalist union is very active and has prepared very interesting proposals for new autonomous regions with a great financial and administrative power. Similar efforts, based on the history of this region, are undertaken in Silesia where strong local autonomy has been formed before the Second World War, with own regional autonomous parliament and regional treasury. But it is a difficult question nowadays whether such initiatives can be realized in the near future in the face of a strong resistance among central bureaucracy against such decentralization of power and economic decision-making.

In the city of Lodz and its region, local government officials and political leaders do not show such strong aspirations towards own local autonomy; they most likely leave the main decisions to a central bureaucracy or foreign investors.

The city of Cracow is an example of much more intensive local officials' search for innovative solutions for the future of city and region. These local officials and political leaders have wide contacts with foreign investors to develop a cultural and touristic industry in the region.

3. Economic and Social Characteristics of the Cities and Regions under Investigation

In 1990 and 1991, central government has taken the main decisions which determined local government activities. The first decision fixed the financial sources for local budgets, i.e. local own revenues, a share of the central taxes, and a certain amount of central subsidies. But in the face of the declining state budget, 95 per cent of local revenues is taken to the state budget and only 5 to 40 per cent is returned to local communities. Such a situation is caused first of all by the decay of state-owned enterprises at the local level and the very slow development of the private productive sector. As a consequence, there have been drastic cuts in local spending, especially in new investments in infrastructure and ecology. Large cities are in the worst situation because they have the biggest state enterprises which go bancrupt now. So the local tax base has become very tight. It can improve only when the private productive and service sectors will grow up.

The second decision was connected with the transformation of the state-owned local property to local community property. This latter decision could not be realized in a short time what resulted in inefficient local governments' activities to shape the near future of their local communities. The most dramatic example is the city of Starachowice in which the bancrupt state-owned firms can destroy a whole community - more than 60,000 inhabitants.

In other cities, especially in such cities as Cracow, Katowice or Poznan, a "small privatization" has developed in the last two years. This term describes the contracting out of some public services to private hands, e.g. shops, restaurants or even communal transport. However, the limited means for the every-day functioning of the cities have severely limited the modernization of the infrastructure. My own research shows that the large cities have only 50 per cent of the financial resources necessary to maintain an appropriate functioning. The most developed

innovation in local government decision-making are: to rise the prices and fees of communal transport, and high charges for privatized shops. Obviously, such a situation causes the worsening of cities functional performance even if for external observers much has changed, i.e. a new look of the shops, especially luxurious ones.

The greatest problem of all large cities by now is growing unemployment. It causes an uncontrolled growth of street retail trade which is undertaken by people fired from the state firms. It is obviously the defensive mechanism to find the appropriate money for a livelihood for many people, but it causes difficulties with garbage collection as well as growing crime in these cities, the emergence of a sort of mafia in many cases.

Another problem has emerged with education and health protection across the whole country as well as in large cities. Because of the lack of money in local budgets the education and health protection services are financed by the central state budget. But the drastic decline in state revenues has caused dramatic cut-backs in these social services. One can find the first examples of closed down hospitals, schools, children day care institutions, public libraries etc.

The city of Lodz, which is the main textile industrial are in Poland, is in the worst economic and social situation. This situation is caused not only by a wrong economic strategy undertaken by the central government, but also by imcompetence of local government officials and their concentration on the political struggle for power rather than on economic solutions. It is very characteristic that in this city with the dominance of "women's" industry an extreme rightist political party (conservative-nationalist) has come up with the most conservative social orientation. This city and region is divided between two competitive post-solidarity political movements. One of them advocates a subordination under central government decisions; people with such an orientation do nothing to reshape the social structure of the city in an appropriate way. The other promotes the invitation of foreign capital, hoping that the sale of the city's productive property can help to reshape the local future.

The city of Poznan in Greater Poland is an interesting example. It reveals conscious and careful local government activity towards the economic and social development of the city without the destruction of local productive property. This city and region had a long self-governmental tradition in the past times, and the new political and social elites are pressing the central government to allow them to take more autonomous financial and economic decisions. The creation of a regional bank is the first proposed decision to allow the collection of necessary finances for the restructuralization of local industry and agriculture. The creation of a local social and health insurance institution is another innovative proposal. Political orientations of local officials and political leaders are much more moderate, even if they are the members of the Christian-Democratic Party, than in the other parts of Poland.

Katowice, in the Silesian Industrial Region, is a city with a other difficult problems, i.e. ecological degradation, the domination of heavy industry, and the highest rate of inhabitants' mortality. This region is neglected by the central bureaucracy, but people from the Upper Silesian Union (regionalists) have made efforts to invite foreign capital for the restructuralization of the region, beyond the central government decision. They also plan to create a regional bank and develop "small privatization" in a wide scope. The Upper Silesian Union presses also the central government for a faster decentralization and local autonomy which may be based on a pattern

Some local governments have tried to solve these problems, but the lack of money and the lack of wide strata of more affluent people have worsened the educational and health conditions of citizens, especially in Katowice and Lodz. If these problems are not solved in the near future, they will spill over and affect the living standards of a large part of Polish society.

New private owners and unemployed are not all new groups which have emerged during the last two years. One can observe a fast growth of new political parties, even if some of them are small in membership. The amibitions of a lot of people are directed towards a new area of social activity. Even if the majority of new political leaders and members of these parties realized only their personal ambitions, it can influence the emergence of innovative, more adequate economic, social or other programs. These programs can be realized not only at the national but much better at the local level. However, it should be connected with more intensive collaboration between local and central governments in the search for adequate solutions of local problems.

Nevertheless, the last findings of the Polish Centre for Public Opinion Research have shown growing apathy and anomymity in Polish society. This is not a good prognosis for the future development of the economic and political transformation of a society. Only 25 per cent of respondents have supported the governmental conception for economic transformation. Only 11 per cent are of the opinion that the political situation develops towards democracy. Less than 40 per cent intend to vote in the new parliamentary election.

5. Conclusions and Hypotheses for the Future

I would like to stress two main conclusions from my research. First, that the economic determinants of national and local policy shape the main problems and difficulties in the present economic and social transformation. Lacking conscious economic restructuralizative policy, too centralized decision-making, too little local government responsibility in this transformation, which is connected with a lack of preparation of local officials to widen urban activity, causes a necessity to shift and modify the economic transformation.

Second, the fragmentation of the new political elites does not bring innovative or alternative economic and social programs because of a lack of appropriate knowledge about modern market economy. Instead, it brings disappointment and frustration not only among citizens, but also among many local leaders. Much more efforts should be directed towards a good preparation of local officials to widen urban activities, e.g., to a construction of programs of local economic development, the solution of ecological problems, housing or education. There should also be much more conscious efforts towards the mobilization of local community members to a creation of self-helping groups to resolve the social and families needs.
I would also like to stress that the new privatization program can not bring positive results until there will be enough room for local governments' own activities towards the economic development of their cities and communities. As examples from other societies - France or Germany - can show, a extensive local autonomy can bring much better results not only in a short term but even more in a long run to reshape and transform the capacity of a society at all levels to development and avoid stagnation or even regress. The development of society is not an out-dated

category, although large barriers are found on this road. The slogan at the end of the 20th century could be "Thinking Globally, Acting Locally". More and more people in Poland do see the necessity to use this way not only as a demagogic slogan for a parliamentary election, but first of all for proper and adequate solutions of the present problems.

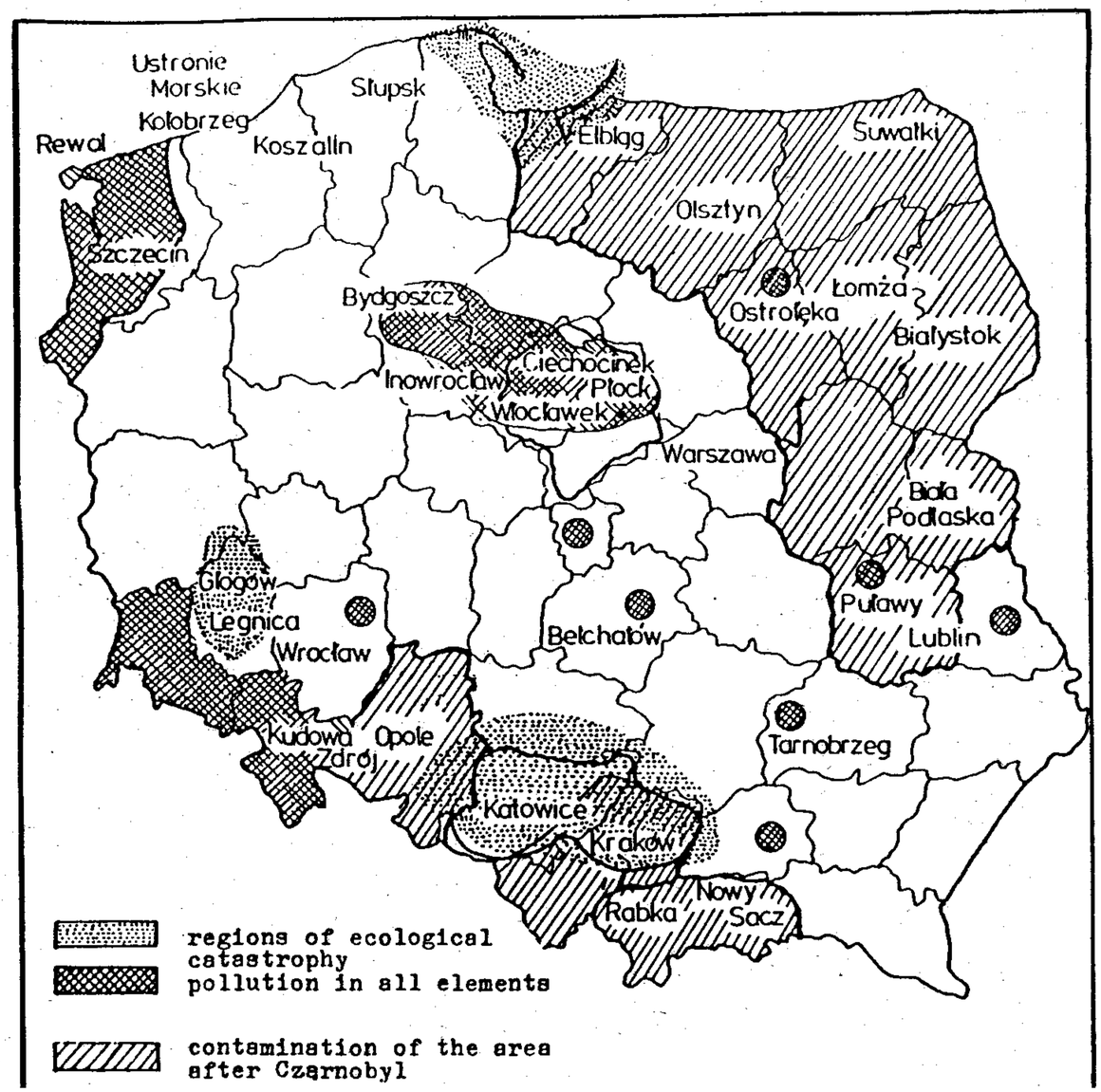
The difficulties of economic changes raise the question of the development of political democracy not only at the national but also at the local level. One can observe that many people are concerned that a new kind of dictatorship could evolve and could block the positive changes in social activity and mentality.

The results of the research I have carried out in four main Polish urban-industrial agglomerations have shown that a lot of people are really conscious of these problems and search for adequate, innovative solutions, but they are blocked by the central bureaucracy and its decisions. A strong struggle for more autonomy and local democracy can emerge in the near future in Poland.

The next step to describe the coming changes will be a research on citizens' opinions and preferences towards their own possibilities to shape the future for themselves and their families. It can also be a good possibility to test a next sociological hypothesis: Is it possible to shift from a traditional to a modern society at the time of such a drastic, systemic transformation from one economic system to another - or do they go together? Is a cooperation possible between society and new political elites at all levels to resolve new challenges?

The future is unpredictable, but nothing has happened by itself. All are the results of the decisions and activities that are undertaken by people. What are these decisions? What type of activities can bring the most positive results not only for the individuals, but also for the community? What are the ways in which local governments could mobilize community members? These and other questions will be under investigation in the near future.

The role of a sociologist is not to take political decisions, but to warn against negative social consequences of bad economic decisions. However, the sociologists should learn the appropriate solutions from the experiences of other countries which performed such economic transformations in search for innovative modern solutions.



SUSTAINABLE DEVELOPMENT AND THE POST-SOCIALISTIC CITY

Martin Masek

1. Spatial Development of Slovakia in the Socialistic Period

Slovakia in the past was a country with an underdeveloped industry with a low degree of urbanization, e.g. in 1940 only 23.5% of inhabitants resided in towns with more than 5000 inhabitants (in 1950 it was 24.9%) (Pasiak, J., 1990). In the beginning of the socialistic period, this state was comprehended as negative, indicating a low degree of the industrialization of Slovakia. That is why the spatial development of Slovakia in the previous period was influenced by strong industrial tendencies. The substantial trend of directive spatial development was "the inevitability of the intensification of the urbanization process through the growth of concentration of population to cities" (Pasiak & others, 1990). In this context the philosophy of the spatial development of Slovakia was based on the classical industrial urbanization, which was typical for more developed countries in the 19th and early 20th century.

The process of concentration was supported by the directive and violent collectivisation of the agriculture. This process released the demographical potentials from villages.

This transit to the growth of population concentration to cities was included in the planning process at the beginning of the 60's and reached its peak in the official Plan of Urbanization of Slovakia (URBION, 1976).

The origin of the Project of Urbanization was influenced by wider political and ideological background. During the totalitarian period, everything was subordinated to the central system of power, which was manifested by the central top-bottom settlement subsystem. This subsystem was defined by the hierarchical and subordinal structure of settlements, in 5 basic levels:

- cities of the district importance
- cities of the county importance
- towns of local importance
- non-central towns/communities of higher importance
- other non-central towns/communities (Michalec, J., 1976)

In this way, the whole territory of Slovakia was organized. The planning was subordinated to this scheme too with the Project of Urbanization and connected general plans of all cities and

5. In suburbs the land is without owners. In spite of the large development potential of this land it is unused. There is no cultivated vegetation. (In the context of the future the existence of this land is positive.)

6. There is a couple of particular problems, for example the growth of the number of cancerogeneous illnesses, growth of the air and water pollution etc.

7. A particular problem is the education of architects. For example, architecture in Czechoslovakia has a long modernistic / functionalistic tradition, which was deformed by the socialistic "reductionism". In the sphere of urban planning the illusion of the almight power of planning has developed. In the same time the, comprehension of urban planning as an art creation originate. The rational base of the urban planning was reduced to norms and criterions. The modernistic space-pattern as the continual non-articulated space, is used nowadays and implies some new problems (as is the using of the land without an owner).

of 1990 one third of enterprises were insolvent; this problem was particularly great in basic, chemical and arms industry (WIFO,1990). The economical situation has rapidly worsened - the consequence is expressed in the growth of prices (from January to June 1991 the growth of prices was from 26.7 to 68% for various kinds of goods), growth of living costs has risen more than 40% and growth of the unemployment (in Slovakia 6.2% in June 1991) (Hospodarske noviny, June 1991).

The political scene is destabilizied - instead of economical problems nationalistic questions and problems of competency are discussed. The electoral period was too short - only two years, what produce the political fights On the level of the city policy the situation is similar. More than 50% of mayors are former communist, who are trying to prolong the principles of the state paternalism. Relics of the state paternalism are observed first of all through the low activity of authorities in cities to solve own problems and waiting for the state support and help.

The deetatization of the state administration in the level of cities is running too slowly. City self-government has not stable economical funds, the tax system reform is still not prepared. In larger cities growth is the decentralistric tendency and is directed to the wider competency of the

same time it organizes mutual help among cities and communities in solving administrative problems. Besides the Association of Cities and Communities the partial associations originate (for example the Regional Association Zahorie), which are suited to the natural organization of the settlement net.

The state territorial policy is still based on previous positions in spite of the fact that the 7-degrees structure of the settlement system was reduced to 3 degrees (ministry, district, county). The structure of the state territorial administration and the results of the development of horizontal relations are not identical. This situation is prolonging the state-bureaucratic principles of spatial state policy. With the regard to the fact, that cities and communities have no own financial resources and depend on the state funds. Such situation can lead to great deep disproportions in the development of the settlement system.

Another problem is the strong, 40-year-old tradition of the directive planning. The origin of this tradition is in the funcionalistic tendencies in architecture and urban planning; nowadays is presented first of all by the illusion about the almighty power of the plan. Town and regional planning always was a part of education at the architectural schools, which as well as their graduates. After the short time of post-modern thinking the recidive of modernism (including functionalism) had emerged, modernistic neo-styles are renewed, as well as patterns, norms and ideals.

4. Outline of an Alternative Solution

The decentralization of the settlement system in post-socialistic countries is the inevitable step towards the remedy of the contemporary state. Decentralization of the settlement system can be of two different characters:

A) etatistical character, where competency of the state center are proceeded with the state administration on the lower level, or

B) de-etatistical character where competency of the state centre will be passed to the self-government of cities and communities and their associations.
In reality the decentralization has both the etatistical and deetatistical character - the state power is distributed to the state administration as well as to self-governments of cities and communities. However, one of these influences dominate and we can distinguish two kinds of the decentralization.
Every kind has a different order and results. The existence of a strong state power on the lower level enhances vertical relations in the settlement system. This bureaucratic and power phenomenon secures the existence of administrative territorial centers of the state administration; in the same time weakens the horizontal relations in the structure of the settlement system. In the other case, when the self-government is preferred, horizontal relations are developing. This is connected with the weakening of the central relations and with the restructuring of the settlement system - with the "new polarization".

Etatistical and de-etatistical principles are only two forms of the decentralization of the state power, and are not contradictional, but supplemental. The developing of the vertical relations

can be accompanied by the growth of horizontal relations. However, the development of horizontal relations is more important and interesting, because these can complefe the restructuring of the settlement system (Masek,M., 1991).

Horizontal relations can link the lower level of the settlement system what can lead to form of the international settlement net. The development of horizontal relations is the manifestation of activity of cities and communities, of their needs, responsibility and decisions. In the vertical direction is this phenomena reduced to a very low degree. In this context the development of horizontal relations is an inevitable process, i.e. the step towards the solution of the crisis of the settlement system. In the framework of this process a new set of positive relations in the settlement system can be formed. They can evolve the improvement of internal conditions of the city development. However, this will be accompanied by lot of negative phenomenon (Masek, M., 1991).

One of starting points of the solution of historical, spatial and social discontinuity of post-socialistic cities is the diminishing of the present degree of concentration of population in cities. In this sense cities will use and develop their own resources and can step by step eliminate consequences of the social discontinuity. The fundamental presumption is the opening of the flat-market, which must be completed through the regulation possibilities of the city. This step will lead to the social segregation in the city, what can be dangerous in this period, when the middle-class is underdeveloped. The difference between the top and the bottom can be too large. That is why the local initiatives in the city must be stimulated and developed to renew the feeling of the local identity of citizens.

One of possibilities how to eliminate the spatial discontinuity of the post-socialistic city, which separate the city both in the pragmatic and semantic sense, is to open space between the historical and new "socialistic" part of the city as well as free space in socialistic parts. This parts, has two potential roles: ecological one, as green space and industrial & service one, as the resource of jobs for citizens in suburbs. These roles are contradictional in lot of moments and the harmonization will be very pretentious in the sphere of technologies as well as in the sphere of the city-policy - in the context of not quite rational images of groups of preservers about the clear green parts in the city. This image is unsustainable because this space has no owners, or the owners have no funds to develop such green enclaves.

Interrupted historical continuity is irreplaceable. However, there is only one possible solution - maximal carefulness on the historical environment and the natural development of the city in the harmony with the social development. In historical parts of cities the development of the housing must be supported to prevent the growth of decrease of inhabitants.

The substance of the alternative solution is the bottom-up principle, which is based on the development of local initiatives. Without this step it is impossible to eliminate problems of individualization, the social life as well as the problem of land without an owner. Besides the new order presuppose large scale of prevention measures, which must begin in the level of educational programs. This is the second direction of changes. Educational programs must be prepared in two parallel: the first one in educational programs for citizens, the second one has to be developed for planners.

At the same time it is inevitable to create a link between the scientific-research community, political and governmental institutions on one side and the citizens on the other. Such a link could serve to disseminate new research results and innovations to practice thus filling the gap in creativity and competitions lacking in the past unsustainable development.

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SUSTAINABILITY IN THE BUILT ENVIRONMENT: SOME ISSUES FOR THE DESIGN PROFESSIONS

Charles Middleton

Abstract

The rapidly escalating impact of human activity on the global environment is a critical issue for the foreseeable future.
Population growth and rapid urbanization in less advantaged countries have been targeted as major problems. These certainly contribute to humanity's growing influence on the biosphere. However, consumerist lifestyles in industrialised nations such aus Canada are based on extensive use of non-renewable resources, and are a primary source of environmental problems with global consequences. Urban life-styles in automobile-oriented cities, and the energy technologies that support them, result in heavy resource-consumption. But they are also emulated by cities in other countries, often with the assistance of technical expertise from the West, so that problems propagate themselves.

In order to attain sustainable development as a basis for the future of cities in both the more and less-advantaged countries, it seems lear that current energy-consuming development of the built environment must be challenged by those who participate in design. Architects, planners and engineers, in new forms of collaboration, are in a position to undertake the development of innovative models for cities that use fewer resources. There are fears that such change would result in reduced standards of living. The challenge is to provide alternatives that would improve the environment, as well as the quality of life. Recent developments suggest that this is becoming increasingly possible, but much more needs to be done.

1. The Human Environment

Despite ability to use technologies to control our environment, we human beings are still dependent on the same environmental conditions that both support and constrain other animal species; gravity, the warmth of the sun, protection form cosmic radiation, air, water, food, and all the other components of an energy cycle in which we all play a part. Without this we would cease to survive. As our collective activities increasingly result in destruction of the eco-system on which all depend, people must somehow develop ways to preserve the environment, and thereby safeguard both our own futures and those of our fellow creatures.

2. Growth

Escalating impact of human activity on the ecology of the world is constantly being documented. There has been dramatic growth in numerous areas in the forty five years since the Second World War. The significance of this brief period is that, on the one hand, it is extremely short in historical terms but has seen growht of explosive proportions. On the other hand, it is sufficiently long to encompass the experience of children, parents and even grandparents in human families, who have not experience of less consumerism and rapid change.

In this situation, the first, continuing, and most obvious area of growth is that of the world's human population. This is seen by many as the major threat to ecological stability in the biosphere. However, growth is even more rapid in aspects of human activity other than population growth alone. Growth comparisons for the period from the mid-forties to the mid-eighties are given below.

	mid forties	mid eighties	growth
World population (billions)	under 2.5	over 4.5	200 %
Urban population (billions)	under 0.7	over 2.0	300 %
Energy demand (million tonnes of oil equivalent)			
Total, all sources	about 1,500	over 7,500	500 %
Coal / lignite	about 1,000	over 2,000	200 %
Oil / natural gas	about 500	over 4,500	900 %

(Times, 1988, pl.7)

As these global estimates were derived from diagrams they do not represent precise figures. They are sufficiently useful to show the overall trends. They indicate that demand for energy has far outstripped overall population growth, and even urban population growth. Growth in demand for oil and gas soared in the forty year period, and at 900 % was more than four times that for coal. These are resources whose consumption is directly associated with cities, atmosphere pollution and global warming.

3. Urbanization

Urbanization, the growth of populations concentrated in cities, seems to be an increasing problem for the ecosystem. The most rapid change is found in less-advantaged countries, but it is not confined to them. It also continues in wealthy nations even with low natural population growth rates.

World Bank indicators show annual urban growth rates in many low income countries to be in the range of between 5 and 10 percent, while there is a very great increase in large cities of over 500,000. But even in the case of Canada, with a comparatively low population growth rate, the number of cities of over 500,000 went from 2 to 9, in the period from 1960 to 1980, while their populations grew from 31 to 62 percent of the country's total. (World Bank, 1990, p. 238)..

Urbanization continues at its own fast pace, in countries of slow or rapid population growth. Direct consequences are increasing consumption of non-renewable resources processed into building materials and consumer goods, or used as fuels. In addition, the spread of cities results in pressure on agricultural and forested land, and in concentrated production of food and cash-crops, mono-cultures, and the use of fertilizers from petro-chemical industries. This urban-centred cycle also results in large-scale accumulation of wastes, and increasing pollution.

But along with growth of urban populations comes more widespread acceptance of urban lifestyles. The growth of the built-environment, itself an ecological problem, generates a number of other related difficulties.

4. Technologies

Rapidly advancing technology has made possible escalating urban growth. But choices as to qhich technologies are developed, and which are by-passed, is affected by what Ronald Reagan called "magic of the marketplace", with all its inadequacies and biases. Amongst the technologies that have thrived in the marketplace have been those of communications and transport. Together they have become most influential in the growth of the built environment as we know it.

The currently accepted technologies of transport by road, rail, air and sea, allow the easy transportation of people and goods anywhere in the world, over long or short distances. Themselves based on fossil-fuels, particularly oil, they also provide for comparatively cheap and continuing transport of fuel from distant sources to concentrated urban markets, with artificial heating and cooling for comfort, permitting economies of scale, but at the same time contributing to more exploitation of non-renewable resources, and further consumption and pollution.

Communications technologies and media, including television, film and radio, now permit instant dissemination of knowledge about the attractions of city life, even to the illiterate. Through advertising, they stimulate expectations and aspirations for new consumer products. The cumulative impact of life-style advertising and film is arguably greater in promoting urban living and consumerism than in sales of specific products.

Increasingly in less-advantaged countries, as in the more affluent, the combined influence of the technologies of transport and communications facilitates rural-urban migration of young people, pushed by dissatisfaction with the perceived problems in their rural homes, and pulled by aspirations to experience the "bright lights" of the cities. But for urban consumers, the only means of exchange is money, and everything must be paid for. For many, the attractions of the city quickly lose their charm as realities of unemployment and urban poverty sink in (Middleton, 1980). Resource to drugs and prostitution is all too common. But once the move has been made from rural hinterland to city, few return.

5. Consumerism

Growth of cities is paralled by increasing consumerism. It is curious to observe the extent to which the relatively affluent people of western countries identify with the notion that they are "consumers", rather than with numerous other roles with which they might identify themselves as human beings; that they see their first function in life to consume, rather than to be providers for the next generation, or to support or contribute to the social and ecological structures that support them.

In relation to sustainability, the problems of consumer-oriented development of the western countries is twofold. In the first place, there is the inherent difficulty that much of the profit generated is based on the extraction and processing of non-renewable and fossil fuel resources, resulting in pollution; or on fluctuations in the value of land, goods or services that make little contribution to the betterment of society or the environment.

But this is only the beginning. The real problems come with expansion of such over-developlment to encompass populations who do not yet consume to the same level as those in capitalist economies. Globalization of business enterprise, supported by the "new world order" and led by the interests of profit-oriented corporations with support of national governments, hardly invites hope that alternatives sympathetic to the environment will be sought with any vigour.

There are, of course, exceptions and the research and development arms of corporations in Europe and Asia are experimenting, for example, with transport technologies to reduce the impact of the car on the environment, including improvements in fuels, electric propulsion, improved efficiency in internal combustion engines, and in "umweltschutz", the recycability of entire vehicles.

The laws of supply and demand, as economists frequently point out, will lead through increased costs to more careful use of diminishing resources, untel replacements are found. But costs increase as resources are depleted. Only then, do they begin to stimulate the search for alternatives. They do not work towards protection of resources but towards their exploitation, and free-market pricing provides little incentive for change. Concentrated urban markets exacerbate the problem.

For our long-term survival, it seems that economic systems focussed on renewable resources need to be developed, providing alternatives to the accustomed consumerism of urban areas, and working towardsinherent preservation of scarce resources rather than their extinction.

It seems that the environmental crisis puts this generation of human beings in an unusual historical position. They can predict the results of their own laissez-faire consumption, and for the first time decide to design their communities with the priority of conserving rather than consuming resources.

6. Specialization

Cities, by definition, represent concentrations of people. They have encouraged development of appropriate specializations and technologies. For many urban dwellers, these result in a growing psychological distance between them and the natural processes of growth and regeneration upon which they depend. The example of city children whose understanding of the world is that milk comes from the boxes, rather than cows, is all too typical.

In cities, with few exceptions, we stimulate understandings of the world that relate only to those built-environments, and not of the larger global forces within which the cities themselves survive. The capacity to understand change tends to become restricted to the specializations of urban life, and the buying or selling of consumer goods or services.

This results in a lack of ability to comprehend of appreciate the cumulative significance of day-to-day activities on the eco-system, and of the dangerous implications of continuous resource consumption on the planet.

7. Resource Consumption

Economies based on the notion that profit maximazation will achieve human betterment appear to in the forefront of the consumption of resources. In energy consumption on a per capita basis, Canada leads the world, including the United States. World Bank figures from 1988 show the following comparisons on the per-capita consumption of oil equivalent:

Canada	9,683 kg.	}
United States	7,655 kg.	}
Sweden	6,617 kg.	}
West Germany	4,421 kg.	} capitalist economies
Singapore	4,464 kg.	}
Japan	3,306 kg.	}
China	580 kg.	}
India	211 kg.	} other
Tanzania	36 kg.	}

(World Bank, 1990, p. 186)

Data on the Soviet Union and countries of the former Eastern Bloc were not available in this publication. The distinctions between capitalist and other economies are not the Bank's. They have been added to illustrate that problems of high resource consumption need to be addressed primarily by economies of capitalist persuasion, rather than by others. The distinction becomes relevant as the Western media have recently chosen to boost the advantages of capitalism over other systems.

However, if the target is indeed a sustainable future, then the capitalist system must be prepared to answer for its record relating to sustainability. The figures published by no less a source than the World Bank, are not promising. Comparisons below are made with special reference to Canada as a consuming nation.

Differences between nations are large. Consumption within North America is around twice that of its industrialized competitors in Europe and Asia. Even Sweden, with a standard of living as high, or higher than Canada's, with a population concentrated far to the north of Canadian population centres, and a climate as cold, uses almost third less energy.

Differences between less-advantaged and more-affluent countries are even more dramatic. The cases of Tanzania and Canada, with populations of almost equal size, can be used as an illustration. On the basis of the World Bank figures, the Tanzanian population continues to grow at well over 3 % per annum. In this, it has one of the world's highest population growth rates and is typical of much of East and Central Africa. Canada with a rate of around 1 % is more typical of the industrialized countries, although several have even lower rates.

Today, Canadians, in a free-market economy, continue to be the world's greatest users of energy on a per capita basis (Boyle, 1990, p. 249). They consume energy resources at a rate 268 times that of Tanzanians, in a one-party planned economy. Even allowing for some error in the figures, discrepancies are so great that the questions must be asked who, the people of Tanzania or of Canada, the less-advantaged countries of the more affluent, the socialist or the capitalist, are more responsible for pressure on the earth's resources. It must also be asked whether it is valid to target high population growth of less-advantaged countries as the primary cause of resource consumption, as often claimed, and whether Canadian lifestyles, while comfortable, are 268 times better than Tanzanian, in proportion to resource use. There is a continuum of amenity and consumption between the extremes.

The figures suggest, however, that countries at the extreme of urbanized, industrialized, free enterprise economies may have a detrimental impact on sustainability in excess of any advantages.

8. Pollution

Amonst the impacts of resource consumption is pollution. Industrial activity is too frequently matched by contamination of the environment on which humans and all other species rely, with toxic, chemical and nuclear residues, and overloads of less hazardous materials. Consumption of

resources has resulted in wastes that are now polluting the globe as far as the Arctic and Antarctic. As the above comparisons show, resource consumption is lower in less developed countries than in the consumerist, industrialized world.

In 1988, the U.S. generated 660 kilograms of garbage per capita, and Canada and the U.S. together produced roughly twice as much garbage per person as Japan or West Germany (Young, 1991, p. 44). Canada, however, has less than one percent of the world population. If the rest of the world were to follow its present example of consumption and waste, the results would be catastrophic. The globe simply could not sustain consumption by six billion people at the accustomed rates of uran consumers in North America.

9. The Built Environment

The sprawling suburbs that are so much a feature of North American cities, and increasingly of other parts of the world, go together with automobile oriented transportation systems.

In a radio series on technology, Ursula Franklin made the point that although population growth and the resources needed to sustain it are rationally discussed, no "demograhic data base exists for the world's growing population of machines and devices". She went on to indicate that "although the support structures for the car population are in place, ... birth control for cars and trucks is not an important agenda item in any public discussion" (Franklin, 1990).

In this, she touches on a central issue in any search for sustainability in cities, particularly if one remembers the speed of urban growth and ways in which people are encouraged to emulate consumerist urban life-styles of the west, with assistance from advertising, consultants and experts.

10. Sustainable Futures for cities

A major problem in approaching sustainability in cities of the future is that available data are not identified or co-related in such a way as to make the linkages between urban life-styles and the rate of consumption of resources on which they are based. This anomaly occurs despite very obvious, if recent, explosive urban growth based on industrial technologies. Many writings exist on the social ills of these cities. However, the assembly of data in such a way as to identify the problems of consumerism in relation to resource depletion is sparse.

This can be seen clearly in the structure of such documents as the World Bank's World Development Report, referred to above. Of the 32 tables, which include information on population growth and urbanization on the one hand, and on energy, manufacturing and investment on the other, there is no co-relation in the items that permits identification of the relationship between cities and the problems of their resource consumption.
For sustainable futures in cities of the North and South, this information is critical and must be identified. Only then is it possible for those who design, build of maintain cities to choose appropriate alternatives such as reduction, recycling, or re-use on the basis of established data. It is estimated that a serious commitment to conservation could reduce by 30 to 40 percent our consumption while maintaining or even raising our standard of living (Morris, 1982, p. 141).

This appears a reasonable objective, not only for cities in the more affluent countries, but also in the less-advantaged. In both cases, planning and design based on reduction of consumption would result in better use of land and resources than in the present suburbs and superhighways of the North, or the squatter cities and bidonvilles of the South.
The responsability for change, however, must rest primarily on those consumerist societies who not only have generated the majority of the problem, but who also possess the technological and educational resources to resolve the problem, particularly as they are also frequently invited to resolve the urban problems of other countries.

11. Responsibility for Change

The above being the case, there is a responsibility on the part of architects, engineers, planners and others who determine the shape of cities in consumer-oriented countries to address, not so much aesthetics or convenience, but the central problem of excessive consumption designed into the built-environments that they help create. In this it seems that they will have to look beyond their traditional expertise and towards new collaborations with experts in such areas as ecology.
The construction industry is conservative and slow to change, and in the field of safety rightly so. But in times of rapid change, the response is not fast enough, and new initiatives are now becoming essential. These must come from professionals with a broader vision than perpetuation of the "status quo".
Fortunately, the work has already begun. New building materials are being developed that will conserve energy. Alternatives to conventional sources of heating and cooling buildings are coming on stream. Pasive solar design is being refined. Research into the materials and methods of the building industry is being pursued. And new and more efficient forms of transportation are being developed.
But all this is happening in a piecemeal fashion, while drilling for oil continues and wars are fought in order to preserve access to inexpensive energy, which is inexpensive to neither present-day consumer, nor the environment of future generations.
Again, the responsibility for change must lie with those in the professions who see it as their dury to change or who, like academics, may have some independence. There are precedents. In previous times of upheaval and rapid change, alternatives were proposed by planners and architects for new forms constructed-environment that would be responsive to the changing conditions. Names such as Morris, Le Corbusier, and the Bauhaus come to mind, and the spirit and willingness to look anew at their environments could well be applied to the present.

If sustainability is the real goal, there are plenty of resources to address the issue. However, in a period of history that has seen the unabashed triumph of capitalism over communism, and the emergence of what is called the "new world order", it is timely to scrutinize the credentials of a system that has grown rich and powerful on advertising, consumerism and resource use, to see if its credentials fit the sustainable future we seek. At the same time it is also important to see, whether, with the pressuring of socialism we may not be abandoning people, commitments and skills oriented to long-range planning and development that might be more to advantageous of the peoples of the planet than would profit maximization for a few anonymous shareholders. Is this latter goal sufficient to achieve a sustainable future for all? Or are there other models that might combine the advantages of more than one approach, in the interests of a sustainable future.

12. Conclusion

The discussion above indicates little more than some connections between consumerist life styles and resource consumption. Such linkages should hardly be surprising. The concept that resource depletion is caused by population growth is a diversion from the real source of the problem, which lies not with less-advantaged countries but with the more affluent capitalist economies and their energy consuming urban life-styles. If, indeed, this is where the problem lies, in countries such as Canada that are rich in material, technological and educational resources, then it is important to look to the institutions of such countries to take a leading role in developing solutions totheir urban problems that may in turn work to the benefit of others. By "thinking globally and working locally", as Hazel Henderson notes, it may be possible to show that lower consumption works.

Initiatives are already being taken to develop alternatives to high energy use in Canadian cities, but much more needs to be done, particularly by those professions that design towns and cities. Broader thinking and new collaborations with specialists in ecology and the environment hold the key to technologies for cities that are both more sustainable and pleasant to live in.

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ECOLOGICAL URBAN RESTRUCTURING

Ekhart Hahn

1. Introduction

Cities and thus city planning are assuming a key position in the resolution of the global and increasingly drastic ecological crisis. Cities, especially their development in the last 40 years, have become nothing short of a symbol for the development of a society which destroys its own vital basis, squanders resources and is environmentally alienated.

In a special way, cities represent the materialized and most developed form of a society's relation between human-beings and their environment; this is the basis of the role of cities in the resolution of the ecological crisis. The city is »built thinking«. It is both product and producing, resp. reproducing modality in the metabolic process between nature and society.
Cities are the central point of departure as well as the central object of further development of society's form of appropriating natural resources. Thus they are also the actual place of transition in the relation between human beings and their environment, which is dependent on technical and societal innovations, in the implementation of the latter and in the subsequent transformation of value systems.

If it is correct - and I assume it is - that industrial culture will destroy its own vital basis if it does not adapt to the environment, then this adaptation will have to take place primarily in cities. A series of quantitative and prognostic aspects also indicate this.
Already today 60 to 80% of the population in developed, industrial nations lives in cities of over 20,000 inhabitants. It is expected that world population will double by the year 2025. 90% of this scarcely conceivable increase in population will be concentrated in countries presently designated as developing or newly industrializing. Congested urban areas with up to 30 or 40 million residents are expected.

2. Industrial Urban Development as a Symbol of Increasingly Technically Defined Human-Ecological Relations

The industrial revolution is primarily defined by phases of technological advancement. It began with the invention of the loom and the steam engine (ca. 1793-1848). The second phase is characterized by the invention of trains, steel-making and artificial fertilization (up to ca. 1896), followed by the invention of electro-technology and momentous developments in chemistry (up to ca. 1935). The fourth phase of innovation brought on the invention of synthetic fibers and the industrial production of automobiles, televisions and telephones (up to ca. 1950). The most important advancements since the 2nd world war, which should be mentioned here, are in the fields of microelectronics, telematics, and the exploration of space.

These technological advancements are the expression of an increasingly technically defined relation between humanity and its environment, which led to the basis of a reversal of

demographic ratios of ca. 20% urban and 80% rural population before to 80% urban and 20% rural population today in developed industrial nations.

Industrial technology has made the exploitation of traditional and new (non-traditional) resources possible on a global level. However, up to the present this has mainly benefited a minority of industrial states by increasing urbanization and raising living standards.
The relation between humanity and the environment was increasingly technically defined in past phases of technological advancement and was accompanied by two hitherto largely contrary developments: firstly new »social achievements« and secondly the ecological results and risks of this development which have only recently become more apparent.

Let us examine these »social achievements« which admittedly were always accessible only to a minority and remain so, but whose appeal to the majority are nevertheless unquestionable.
Increasing technical mediation in the relation between man and the environment has meant far-reaching independence from nature, weather, harvest-time, self-provision of foodstuffs, and the responsibility for forming one's immediate living environment. Industrial urban culture has given us the chance to live according to our own rhythms and achieve a new dimension of individual freedom and mobility.

We mustn't worry about how power is supplied. We simply get electricity out of the socket, water from the pipes and put our garbage in the container. We don't have to worry about what happens before or after that moment. Milk and bread can be bought at the supermarket. There's no need to milk your own cow nor bake your own bread. The destruction of communicative and eventful urban space which came with the development of rationalization according to functions and the car-oriented city was more than compensated for by the fact that destinations far away became attractive and accessible (by private car, trains, airplanes).

Organized working hours, increasingly shortened in favour of leisure time are also an achievement of industrial urban culture. There is no doubt that it has led to a reduction in exertion, work and social commitments.

The ecological results and risks of previous industrial-cultural development needn't be detailed here as they have been documented in a number of national and international studies in the last few years (»Dynamics of Growth in a Finite World« by M. Meadows, 1974; »Global 2000«). Special attention should be drawn to »Our Common Future«, published in 1987 by the U.N. World Commission »Development and Environment«, also known as the Brundtland Report. All of these studies prove that a fundamental, ecological reorientation is necessary if life on this planet is to be secured for future generations. This is even more true if the increasing industrialization and urbanization processes are coupled with the prognosis of doubling the earth's population in the next 30 years.

The turning point at which negative consequences outweigh technical and social achievements in their present form has been passed today. The squandering of scarce resources, at a rate previously unknown, and the transformation of valuable resources into worthless trash and dangerous pollutants for sectoral and short-term objectives cannot be continued arbitrarily.
To the contrary, the consequences of this development already threaten people's living conditions on a global level. This relates not only to existential threats in the ecological, social and cultural

spheres which are carefully elaborated in the studies mentioned, but also to the economy. According to estimates made by the Federal Environmental Office, costs ensuing from environmental destruction amount to 100 billion Deutschmarks annually in the Federal Republic of Germany alone. These are purely »repair« costs in which necessary, preventive measures are not yet taken into account. Even more alarming is the fact that these costs are increasing exponentially.

The resolution of the environmental question has become one of the central themes of the late 20th and impending 21st century: not only are experts and a critical minority in many nations convinced of this but responsible politicians and the general public also no longer doubt it. However this by no means answers the question of what this reorientation, which can no longer be postponed, consists of and how it can implemented.

3. On Emerging Sectoral and Technical Solutions Towards the Integrated Socio-Cultural Reorientation of Industrial Society

Industrial-cultural development, which was mainly determined by technological innovation, always sought and indeed still seeks technical answers to the increasing hygienic, social and environmental problems resulting from it.

In terms of the ecologically oriented further development of urban technology and design, it has proven useful to distinguish four levels of innovation. They demonstrate historic levels of technology, as well as the direction for the further development of environmentally compatible technology. Only the fourth level of innovation can really be acknowledged as being »ecologically oriented« technology. Nevertheless, related to a particular problem in a particular place and time, all four levels of innovation provide the best solution, i.e. the only possible one. This must be carefully examined in each individual case.

First level of innovation: Measures according to the »High Chimney Principle«

With increasing industrialization, toxic emissions made the air in cities so bad that their inhabitants' living and health conditions were directly threatened. The first »technical« approach to this problem was to elevate the worst emitting chimneys to a level that thinned out and distributed the pollutants in horizontal and vertical directions, seemingly solving the problem. Similarly, sewage from industry, and increasingly chemical households and agriculture was disposed of in rivers and seas and solid waste was transported to dumps outside the settlements. The limits to this type of »solution« (dilution and distribution) to environmental problems are quite clear today. Nevertheless, this first generation of answers to industrial society's environmental problems is still in use. Sometimes it even makes sense as an intermediate solution, for example in the case of courtyards threatened by high emissions or in the case of vertical exhaust pipes for trucks and buses to protect pedestrians and cyclists from direct exhaust.

Second level of innovation: Measures of technical treatment after the fact

Industrial society's second answer to the worsening environmental crisis were the measures of technical treatment after the fact. The limits to a spatial externalization of environmental problems promoted the development of a new generation of technical innovation: post-operative filter and cleaning techniques. This did not avoid the generation, but at least the uncontrolled dissemination of increasing waste and pollutants. Desulferization of flue gas and sewage purification plants are examples of this type of technique, which became more refined and expensive: the waste incineration, the »controlled« dumps for waste and toxic waste and the intermediate and final storage of nuclear waste.

These concepts of technical treatment still largely represent the standard technical answers to increasing environmental problems. However, it has become a threatening certainty that these techniques cannot really solve the problems but only shift or displace them spatially and temporally. In terms of managerial economics (applying the causal principle) it is also becoming more and more difficult to find places for additional dump sites for waste incineration plants, power stations and atomic energy plants since no-one wants them in their neighbourhood.

Third level of innovation: Measures of technicalprevention and problem avoidance

The goal of innovation at this level consists in minimizing the use of raw materials, energy, waste and emissions in the production of goods, their use and their final storage. This approach demands cyclical thinking, as environmental problems can only be solved and financed this way.

Examples of this new generation of technology in the fields of architecture and urban planning are new forms of climate-adjusted building, solar and wind energy techniques, new saving, multiple use and cyclical techniques for water, the further development of building materials and techniques in terms of cyclical courses, their health and environmental compatibility. These techniques are not yet very widely used.

Fourth level of innovation: Socio-ecological principles of technological design

Designing socio-ecological technology is an extension of the third level of innovation which in its purely technical orientation does not give enough consideration to the socio-cultural causal relations of environmental problems. A real solution to the environmental crisis is possible only when social and cultural dimensions are integrated into it, since the causal relation and the actual potential for solutions lie therein. Designing socio-ecological technology means making the environmental and social dimensions of technology experiential (again), overcoming the reduced comprehension of environmental goods as »fuel«. The point is to regain the sensual experience in the relation between the technology's creation and use, and the environment. An active, human role as a partner responsibly handling and forming this relation must become a decisive factor again.

4. Elements of a Strategy for Ecological Urban Restructuring

The conception of »ecological urban restructuring« was elaborated in Berlin in order to facilitate new approaches to architecture and city planning with such socio-ecological principles of design. Since 1984, several pilot-projects on the building levels and neighbourhood have been carried out. The are four main elements concerning this conception.

(1) The »Eight Points of Orientation« which serve as a guideline and as a basis for discussion on specific projects as well as suitable political strategies and individual measures.

(2) The model of »Fields of Action« and »Building Blocks« with which the possibilities of and necessities for ecological urban restructuring are being systematized; they represent an aid for thought and work when dealing with the contradictions between existing sectoral planning and the necessity of new »integrated« thought and action.

(3) The »Conception of Ecological Neighbourhood Development«. Neighbourhoods that are comprehensible for their inhabitants have been discovered to be the most important level of action for ecological urban restructuring. Multiple possibilities towards networking individual measures to integrated concepts with the participation of the inhabitants and other local actors are offered here. Through decentralized local networking, individual measures become ecologically effective, economically viable, and socially acceptable.

(4) The »Concept Eco-Station«. Eco-stations represent an unrenouncable infrastructural prerequisite for the process of ecological urban restructuring. What is meant are ecologically oriented communication, culture and trade centers which are communally supported. The establishment of a network of decentralized eco-stations is proposed which will have an exchange at the national and international levels and thus represent the infrastructure for local and international tasks of urban ecological restructuring.

5. Eight Points of Orientation

The »Eight Points of Orientation« were formulated out of the necessity of introducing comprehensible guidelines on ecologically compatible urban planning. Explanatory aids as to what is to be understood by »ecological urban restructuring« are hardly available. Institutions and actors are badly prepared for a topic which, no doubt, will be a central one in the future. The theoretical assumptions and the empirical findings from the research project on central ecological urban restructuring are summarized in Illustration 3.

It is in no way imperative that totally new criteria for thought and action be used to reform the interactions between society and environment. Rather, principles of environmentally and socially compatible technology and forms of settlement, verified by centuries of experience, should be systematized. This observation is made concrete in the terminology of the »Eight Points« and further developed under the conditions of industrial society. Thus a basis was established for the critical discussion of the term »ecological urban restructuring« and its contents.

(1) Human-ethological orientation: If we do not have a better understanding of the »nature in us«, no solutions for the »nature around us« can arise. It is to be noted that we carry the traces of thousands of years of evolution in the natural milieu and in small, social units. Specific behavioural patterns emerge from this, which modern urban planning often disregards. Human-ethological planning criteria comprise the human being's need for individual space and group territory; its search for identity and self-representation; its demand for orientation and social structures.

(2) Participation and democratization: Participation of the inhabitants is the first »ecological law«! The reduction of city inhabitants to mere consumers and considering them only as incompetent recipients of services was a social and ecological dead-end. Personal participation, experience and responsibility in the interaction with the environment will instigate positive learning processes. Decentralization in planning, in the design and implementation of the local habitat leads to spaces for individual and collective awareness and self-realization.

(3) Orientation to cycles and networks: Nature is the most economical and ecological architect. Its products are harmoniously placed into energetic and material cycles, optimally adapted to local conditions. Builders, architects and city planners should again learn from »nature's intelligence«. Pilot projects of ecological urban restructuring have demonstrated that savings of electricity, heating energy, drinking water, wastes, etc. of up to 50% and more are realistic. Apart from this, building materials which are damaging to health and the environment should be substituted; electromagnetic currents should be taken into consideration. When choosing building materials and designing products it is important to consider the whole production, consumption and deposition cycle and its effects on people and the environment (chain or tree concept). This concerns the origin of the raw materials, their production methods, their transport, the use of energy, waste treatment. Corresponding »substance-value factors« should be integrated into all planning activities.

(4) Orientation to nature and the senses: It is not enough to understand cyclical orientation and participation in purely organizational or technical terms. People must be enabled to again experience them personally. This means, ecological urban restructuring is above all a creative task. It is important to get beyond the reduction of functional or aesthetic aspects of the city as the expression of a linear and sectoral understanding of design. Since most of the natural and cyclical relations of architecture, urban planning and technical systems can no longer be experienced sensually, sensitivity and responsibility wither away and indifference as to what is bad and good in life rises. For example, water in the city just occurs between the tap and the drain, and one does not bother about what happens before and after. Under such circumstances the esteem for this vital element must atrophy.

(5) Orientation to qualified density: Ecological urban restructuring implies integration of urban functions, a creative mix of residential, work and leisure activities on the smallest possible scale (qualified density). This means the realization of multiple alternatives for cooperation, and of the respective possibilities for saving time, distance and resources. The task for urban planning then is to develop new forms of mediation between »urban experiential qualities« and the »experiential possibilities of natural elements«. This involves creating spaces for plants on and around buildings and the fostering of small-scale building elements that interact with one another and with nature. The objective is to help urban dwellers to experience the richness of natural cycles.

(6) Orientation to the "genius loci": The Chinese doctrine of »Feng Shui« stipulated a way of constructing buildings and cities, of utilizing land and natural resources »that the landscape was not changed in such a way that the earth's life-supporting energetical influences and operating laws would be disturbed.« This was an important guideline to people's identification, their ability to put down roots and integrate themselves into a given natural context. In a natural-spatial sense, the orientation to the »genius loci« means defining an experiential relation to the geographic, climatic and geo-morphological surroundings, to the flora and fauna specific to the area, through architecture and urban planning. Today, orientation to the »genius loci« means to relate architecture and urban planning to the history of a given place. Reference to the »genius loci« thus means to comprehend the city and the urban neighbourhoods as living memory. Building measures are to be consciously incorporated as links into the »historical chain«.

(7) Ecology and economy: So far, environmental protection policies, as technical and political reactions to remedy environmental damages, have neither proven sufficient nor financially viable. Instead of treating symptoms, we must develop preventive ecological strategies which strike at the anthropological origins of the environmental problems. A new, sustainable symbiosis between economy and environment in the urban context requires innovative instruments like resource taxes, emission charges, billing according to consumption, environmental accounting, appropriate building standards, planning laws and strategic subsidies. Furthermore, it is necessary to create suitable conditions for new forms of cooperation between the formal and the informal economy, between administration and local people towards co-planning, co-production, co-responsibility in forming the local habitats. Initial ideas in this context are now being tested in pilot projects.

(8) International orientation: Local and global environmental problems, the destruction of the resource basis in the developing countries and the waste of resources in the industrial countries are closely linked. Ecological urban restructuring thus requires an international exchange of knowledge and experience, and the mutual support in implementing new urban ecological strategies. Important impulses for environmental policy originate from decentralized municipal networks, a new kind of pressure »from below«. Suggestions to finance such programmes »help for self-help« are on hand. Apart from funds of the World Bank, the OECD and WHO, the »peace dividend«, i.e. the funds hitherto used for armaments may be channelled to this type of activities.

6. Fields of Action and Building Blocks

The question is, how can the proposed »points of orientation« be made more specific and put into practice. On basis of the theoretical foundation presented and of experiences from pilot projects on ecological restructuring, the »fields of action« and »building blocks« were formulated. They try to mediate between the reality of sectoral planning, of existing policy and administrative departments and the necessity of »integrated« thought and action. Three fields of action which complement each other have turned out to be particularly important for integrated ecological urban restructuring:

(1) Urban technology and urban design

(2) Grass-root democracy and environmental communication

(3) Urban economy and political administration

Only by networking these three fields of action does ecological urban restructuring have a good chance. If not, things will remain at a stage of rather exotic and only partly convincing pilot projects. Particularly the second and third fields of action indicate the importance of changes in the economic, social and political conditions which again depend on a new collective environmental consciousness, a new environmental ethic.

With respect to the interdisciplinary and international project quoted above, the three fields of action were defined and made more specific by a number of »building blocks« (see Illustration 4).

These building blocks relate to established and new planning areas, policies, instruments and research proposals which are of particular importance to ecological urban restructuring. A variety of dialogue partners can be addressed (persons, institutions and associations) concerning the implementation of strategies; tasks can be formulated, obstacles to their realization can be identified, agreements about solutions reached, and finally implementation begun.

The term »building block« should illustrate that the function and capacity of each building block becomes effective only in conjunction with the other building blocks. In its ecological, economic and social efficiency it has only a limited chance of implementation without this networking.
This does not mean, however, that all building blocks should necessarily be taken into account when planning and realizing concrete projects. The building block model is rather a framework; it serves to recognize the suitable approaches for action, given the specific situation of a project, and to allow use of locally given possibilities.

Urban technology and urban design

The more traditional professions of urban planning and architecture, technical infrastructure and environmental protection belong to this field of action. Specifically there are »building blocks« such as energy, water, garbage, vegetation, traffic, soil protection, urban climate, including a relatively new topic like building ecology. These »building blocks« should be conceptualized anew with the objective of ecological urban restructuring. The following questions should be at the center of the discussion:

(1) What environmental relief can be achieved within the individual building blocks, given the strategies and measures available today?

(2) What (extra) costs are connected to them and what is the cost-benefit-ratio in the middle and long run?

(3) Which financial resources are available to implement measures?

(4) What are other obstacles to implementation and how can they be dealt with?

(5) What type of networking with other building blocks should be considered in order to increase the efficiency of individual measures, minimize their costs and win the inhabitants (resp. other local actors involved) as allies?

With respect to the implementation of ecological urban restructuring three categories of measures have proven reliable for which practice-oriented catalogues (resp. hand books) are now available:

- Standard measures, i.e. measures which are technically tested and available on the market and which are connected with little or no extra cost. Examples are water-saving technology, certain energy-saving measures, environment- and health-compatible building materials, urban greening.

- Extra measures, i.e. products and technologies on the market which have been tested technically but involve extra costs in planning, investment or use. These are ecologically effective measures which are not yet economically viable within the present framework of urban planning.

- Experimental measures, i.e. measures that are still in a research and development stage, hence are not yet state of the art. These measures are used in pilot and research projects with considerable extra cost, but may play an important role in the future.

As to urban technology and design it has proven useful to distinguish the four levels of innovation introduced before (see Illustration 1).

Grass-root democracy and environmental communication

It has been demonstrated that a restriction of urban planning to purely technical measures is too shortsighted and cannot really initiate a process of ecological restructuring. It is necessary to combine technical measures with environmentally oriented communication, and to introduce democratic participation and corresponsibility of the inhabitants from the very beginning of planning.. Education and techmcal assistance play an important role here. »Environmental shops or stations« should be established as centers for environmental information and communication.

With regard to the measures of environmental communication it is important to include local bodies such as churches, youth organizations, clubs, etc. as multipliers in such a process, but also to reactivate untapped resources of the existing administration. Thus, according to given local conditions, an attempt can be made to incorporate schools, nurseries, health and cultural institutions into the urban planning process. Citizens' initiatives, self-managed projects which already exist and whose work can be fostered are very important when implementing a neighbourhood-related programme to reduce solid waste, to recycle materials, to compost organic waste and to promote environmental communication in the way described.

Urban economy and political administration

Ecological urban restructuring can and must also be understood as an economic strategy of creating additional employment and developing new professional capabilities. In energy and water conservation, in optimizing transport, or in urban greening, many new employments, particularly

as and professional opportunities emerge. All these activities are relatively labour-intensive; ecological restructuring thus can become a positive employment programme.

However, additional employment and new professional capabilities on the city and neighbourhood levels are strongly dependent on administrative innovations on the national level. New environmental policy instruments, like resource taxes, emission charges, new accounting procedures, and the adaptation of planning instruments and planning law all fall into the competence of the national government, some new policies (taxes and charges) even need approval on the international (European) level. The discussion concerning this new environmental policy framework for economic activities is well advanced, the implementation of the respective proposals, however, is lagging behind.

7. Concept of Ecological Neighbourhood Development

Urban neighbourhoods, especially areas for multiple uses (living, working, leisure, shopping) are particularly suitable for successful ecological urban restructuring; four characteristics of neighbourhoods (see Illustration 5) are important in this respect. (1) The neighbourhood as a defined area of several blocks, with the streets and open spaces belonging to it, is an entity of people and its group territory, which they are familiar with. As a »human habitat« it features daily experiences, attitudes and actions, and consequently has a telling influence on the individual's well-being. One perceives the neighbourhood by looking out of the window, on the daily or periodical shopping trips, on the way to work while playing with or supervising children, while walking the dog, etc. The neighbourhood thus is the basis of communication, of one's social identification and the discovering of common interests among its inhabitants.

(2) The severity of environmental problems but also the potential for solutions are recognizable best from the intimate aquaintance with one's own habitat. On the neighbourhood level, the environment and the living conditions are influenced by the environmental effects of business, of emitting power plants, of residues which pollute the water, of leisure areas, of traffic noise, and garbage generation. This also concerns other perceptions like devalued inner-city spaces, emissions of incompatible activities and modes of production, aesthetical pollution, etc.

(3) Since the state and other central institutions have failed to provide and secure acceptable living and environmental conditions, they are confronted by local communities not willing to accept these and fighting for their right to sound living conditions. Such initiatives by local groups can be observed everywhere in the world, and indicate a process of increased participation and of democratization. Increasingly, inhabitants are prepared to invest ideas, time and money for their local habitat.

(4) Thanks to increasing environmental information through the press, television, literature and experts living in the area, the citizens of a neighbourhood learn about the specific problems and about realistic solutions for them. In the rather anonymous urban environment of the industrial age, neighbourhoods represent comprehensible spatial units in the sense of the four points mentioned above. In a neighbourhood a relatively large number of functions, accessible on foot or bicycle, are concentrated or overlap; ecologically, economically and socially related effects are apparent to the local people and so become starting points for change. Urban neighbourhoods have a certain potential of resources at their disposal which can be activated under suitable conditions in order to promote ecological urban restructuring. A distinction should be made between material and financial resources on the one hand, and human mobilization on the other.

8. Case Study »Moritzplatz-Projekt« in Berlin-Kreuzberg (see the following graphic pages)

Illustration 1: Four levels of innovation of environmental technology and technical concepts for urban development

Level of Innovation	Symbol	Description
1		Measures according to the "High Chimney Principle"
2		Measures of Technical Treatment After the Fact
3		Measures of Technical Prevention and Problem Avoidance
4		Preventive Techniques and Concepts with Socio-Ecological Principles of Design

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Illustration 2: Implementation elements for ecological urban restructuring

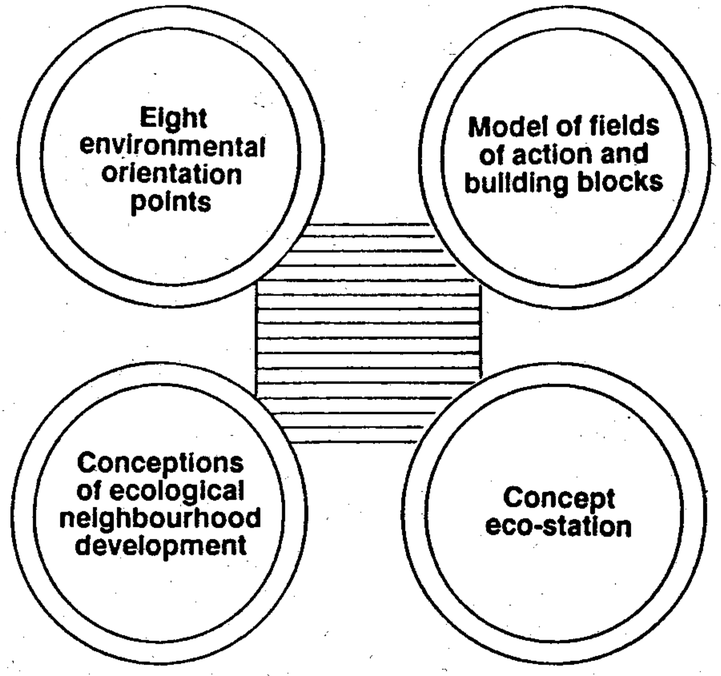


Illustration 3: »Eights Points of Orientation« for ecological urban transformation

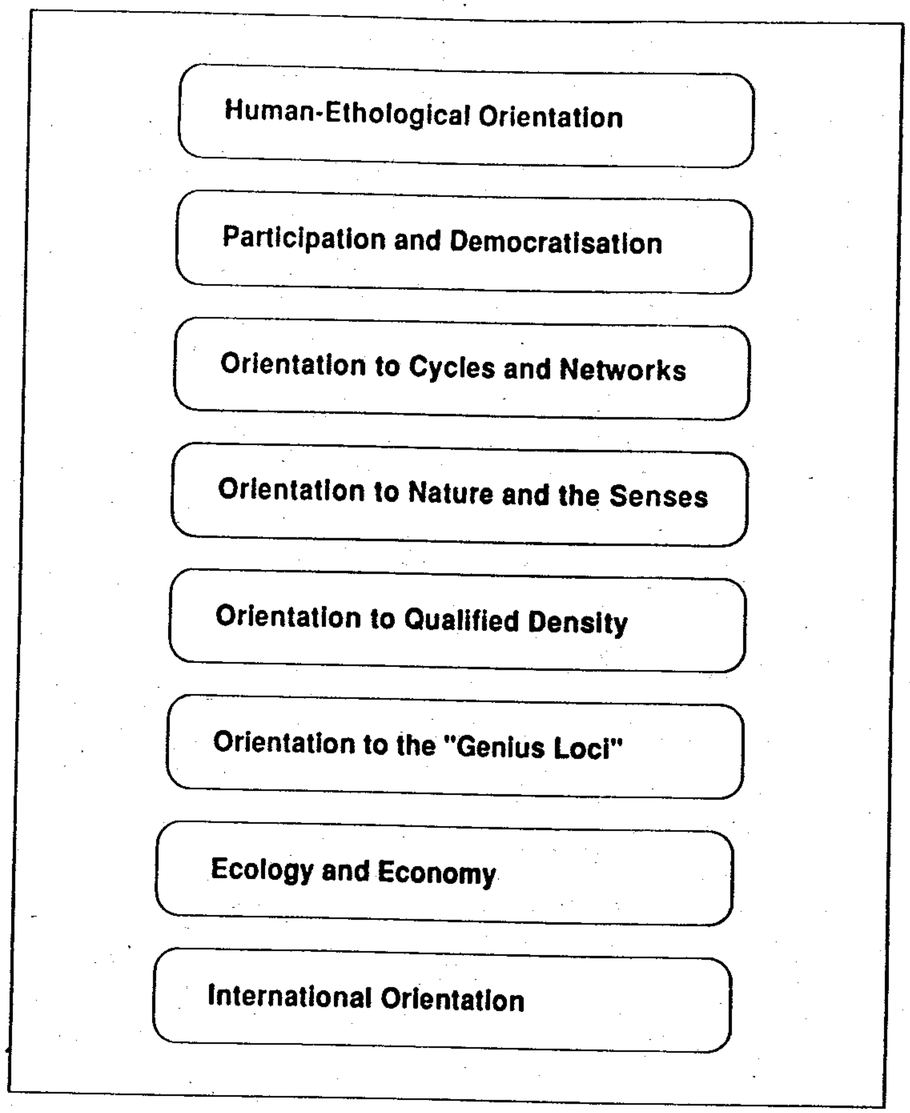


Illustration 4: *»Fields of Action« and »Building Blocks«*

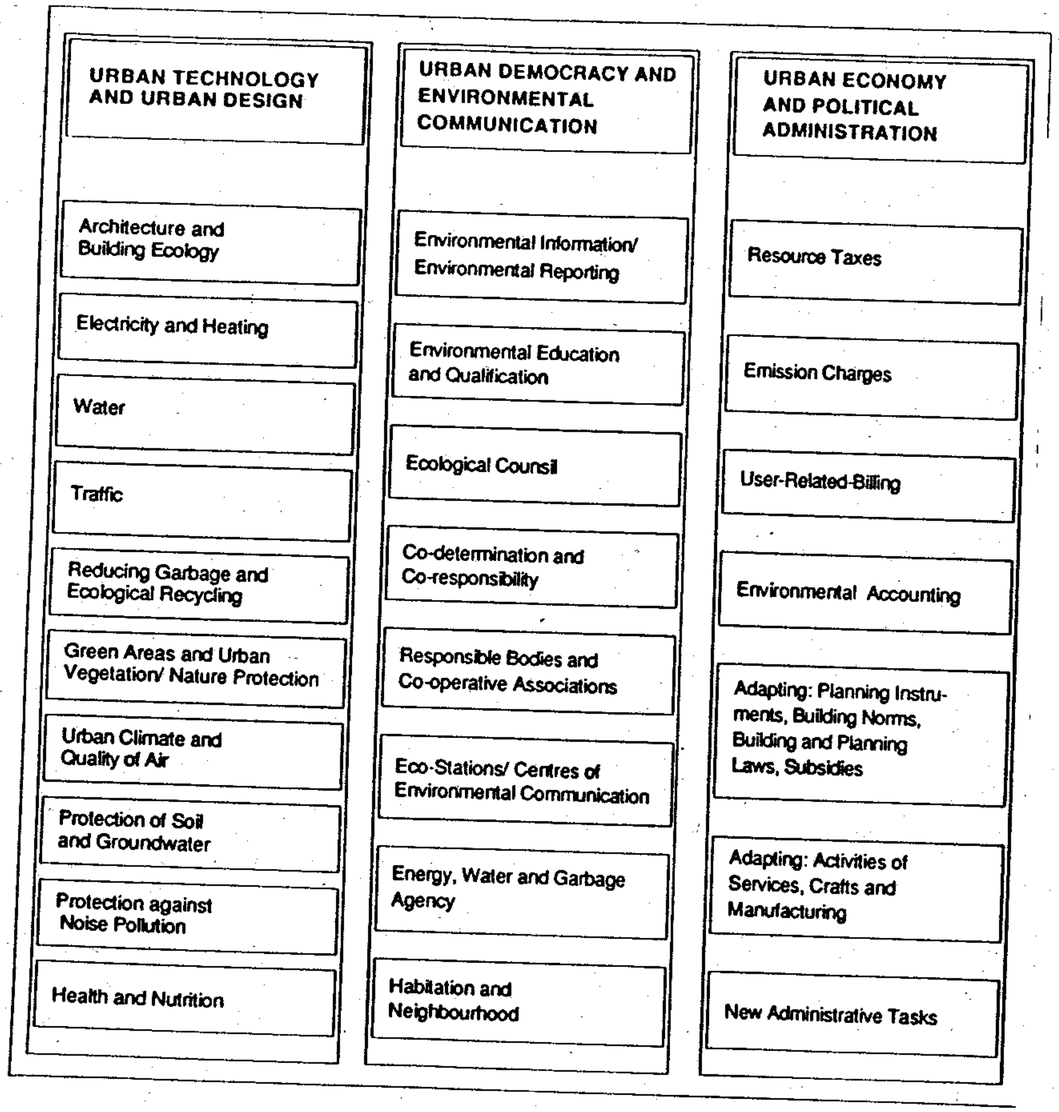
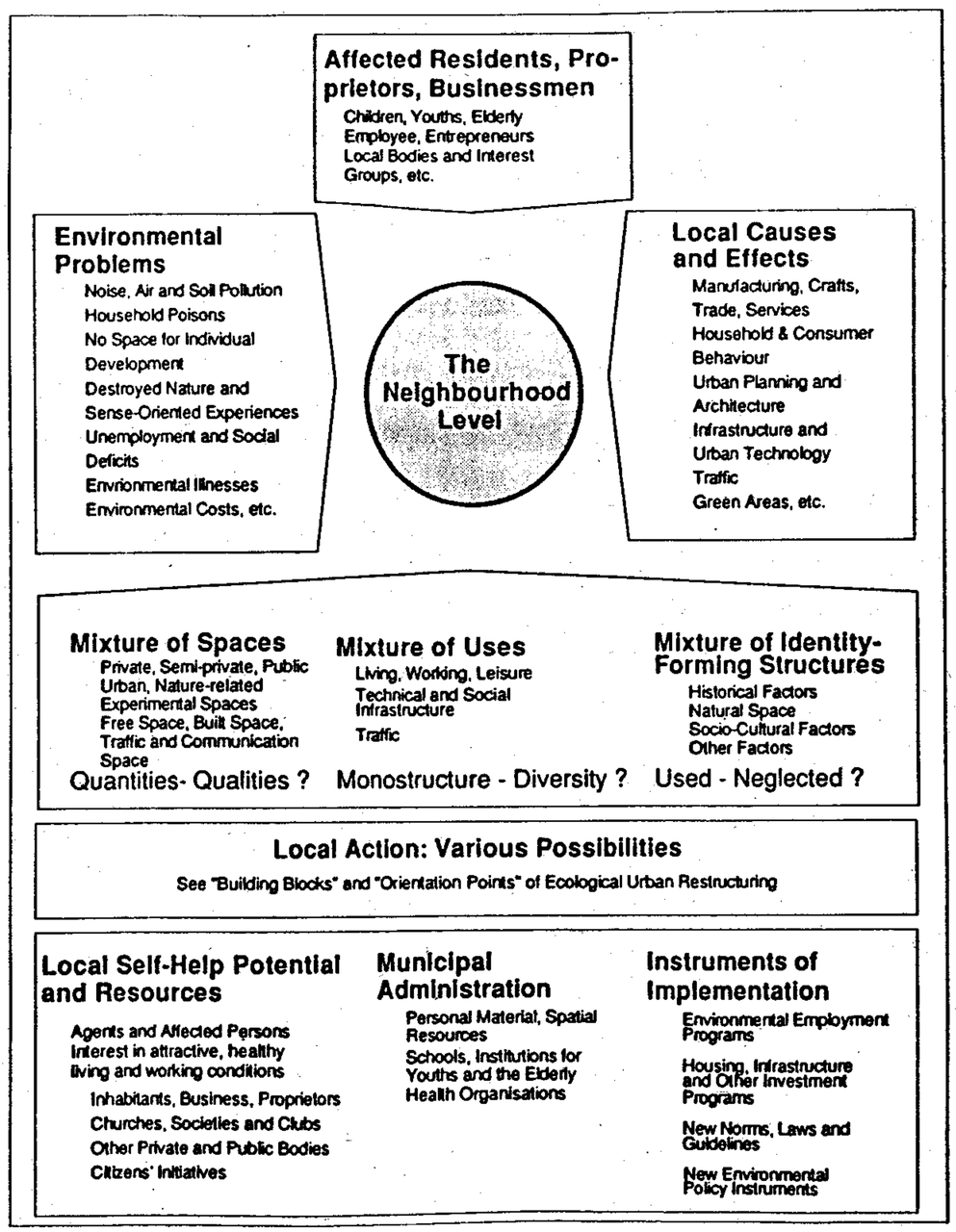


Illustration 5: *Interactive space for living, building and design*



Case Study Berlin, Moritzplatz

In Berlin the neighbourhood around Moritzplatz in Kreuzberg was chosen as the case study area. It is an inner-city area of mixed use with about 2,800 inhabitants, and 1,500 jobs in 0.24 square kilometers. In two of the six blocks in the neighbourhood there are typical large housing estates from the 60's and the 70's. One block contains remnants of the traditional "Kreuzberger Mischung" (Kreuzberg mixture) of the Wilhelminian era as well as larger empty plots due to the war. The other three blocks are used almost purely commercially and are comprised of a different mixture of partly old, partly new buildings. They also have large, war-induced, neglected plots which should be built upon.

On the whole the neighbourhood has the ecological, architectural and social problems typical of Kreuzberg, such as high air pollution, lack of green areas, emissions from resident industry, the present situation on the border of the city (i.e. since 1962 partly along the Wall), imperfect mediation between blocks of old and new buildings, a high rate of foreign residents and low income in areas with older structures, premature aging in areas with new structures. Since 1987 the neighbourhood has been the object of an urban ecological experiment funded by the Federal Ministry for Construction and Housing and the Berlin Senate with the following aims: solving the problematic urban planning situation of long duration; the pilot development of ecologically oriented solutions in urban planning; the development of a procedure to accomodate the inter-disciplinary requirements of ecological urban reconstruction as well as the broad co-determination of the inhabitants and other groups who are affected, and to ensure optimal political conditions as well as the possibility of realising unconventional solutions.

In our research the aims are: to summarize and evaluate the procedural results to date; and the further development of neighbourhood-related environmental strategies on the basis of past and present experiences.

Ecological Problems at Moritzplatz (1985)

Energy: much emissions, low efficiency

- insufficient insulation in the buildings (many windows have single glazing)
- air pollution above average because of coal heating (tiled stoves in blocks 56, 62) and outdated heating systems (steam heating in a factory, block 61)
- low efficiency from single units
- high energy demand due to artificial lighting and air conditioning of large building complexes
- insufficient use of solar energy
- unused possibilities of saving energy and heating in households (household machinery, using heating systems in a wrong way).

Architecture and Construction: monotony and ugliness

- monotonous and stereotypical construction found in many modern buildings
- indoor air polluted by gases such as formaldehyd, dioxin, PCB
- use of non-renewable, energy-consuming, non-reusable and non-decomposing materials
- bad air circulation and dampness due to air-tight walls and windows
- too little attention paid to sensory perception and comfort, electromagnetic rays, acoustics, light and air circulation and radiation from building materials.

Water: abuse of drinking water

- water pollution from chemicals and heavy metals (cleaning agents, industry)
- waste of drinking water, e.g., in toilet flushing
- high amount of rainwater flows into the sewage system (area is covered with asphalt or tiles to 74 %)
- water tax not based on water used by households
- half of the precipitation flows unused into the sewage system
- heavy sudden rainfalls cause an overflow of highly polluted drainage water into the Landwehr Canal.

Micro-climate and Noise: pollution, aridity

- temperature rise of up to 6 C above that in surroundings
- higher concentration of dust in the air
- air pollution and lack of oxygen
- low humidity due to excessive paving or tiling
- poor air circulation in courtyards (cold air pockets, blocks 61 and 62)
- noise and air pollution due to trucks (up to 75 dB(A) in Oranienstraße and border crossing)
- open-ended housing complex leads to noise and air pollution in the interior of complex (block 56 and Otto-Suhr complex).

Green Areas: ineffective use of open space

- low residential and recreational quality due to lack of greening with negative psychological and physiological effects on the people
- reduction of varieties of flora and fauna
- huge open plots (blocks 56, 60)
- complete pavement of open areas for parking purposes
- insufficient use made of roofs and facades for greening.

Refuse/Reusable Materials: loss and contamination

- 50 % increase in household refuse over the last 10 years
- destruction of recycleable materials
- environmental problems because of non-separated collection, combustion and disposal
- insufficient disposal of toxic and other problematic substances
- too little ecological awareness among the people
- infrastructure does not keep pace with the expectations of ecologically aware inhabitants.

Situation at Moritzplatz (1985)

Block 56: housing and industry

- original structure of complex altered due to war damage
- majority are old buildings (17 out of 21); 2 are used for industrial purposes
- extensive industrial usw (transport and scrap metal) on 1/4 of the housing area
- high proportion of unpaved open areas
- fragment of the old Moritz Square complex
- border crossing and checkpoint to East Berlin on the Western side of the block

Block 60: new and old buildings, industry

- diversity in construction; primarily new buildings most of which are 1 to 2 storeys high
- interior structure of old blocks still exists
- predominantly industrially used open areas largely paved
- very little green areas

Block 61: new and old buildings, industry

- heterogenous structure; about 50 % of the buildings are new; half of these are between 1 and 3 storeys
- complex perimeter mostly interrupted
- old complex interior still in existence
- open areas largely paved
- low proportion of green areas
- 17 out of 25 lots used for industry

Block 62: "Kreuzberg Mixture"

- most of block construction dates back to the Gründerzeit; only 2 new buildings in the western part
- proportion of industrial to residential is about 50:50
- low proportion of open areas, covered to 95 % with pavement
- no green areas

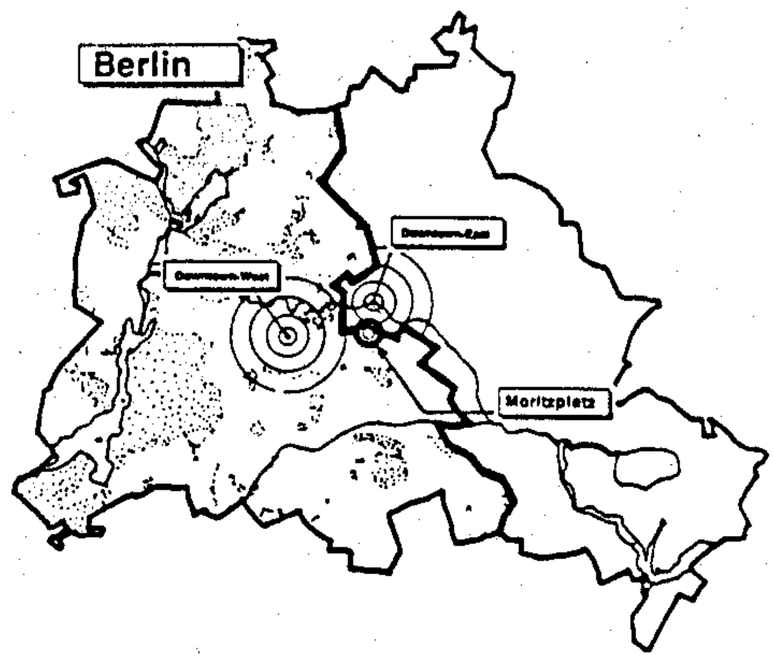
Block 605: new housing complex

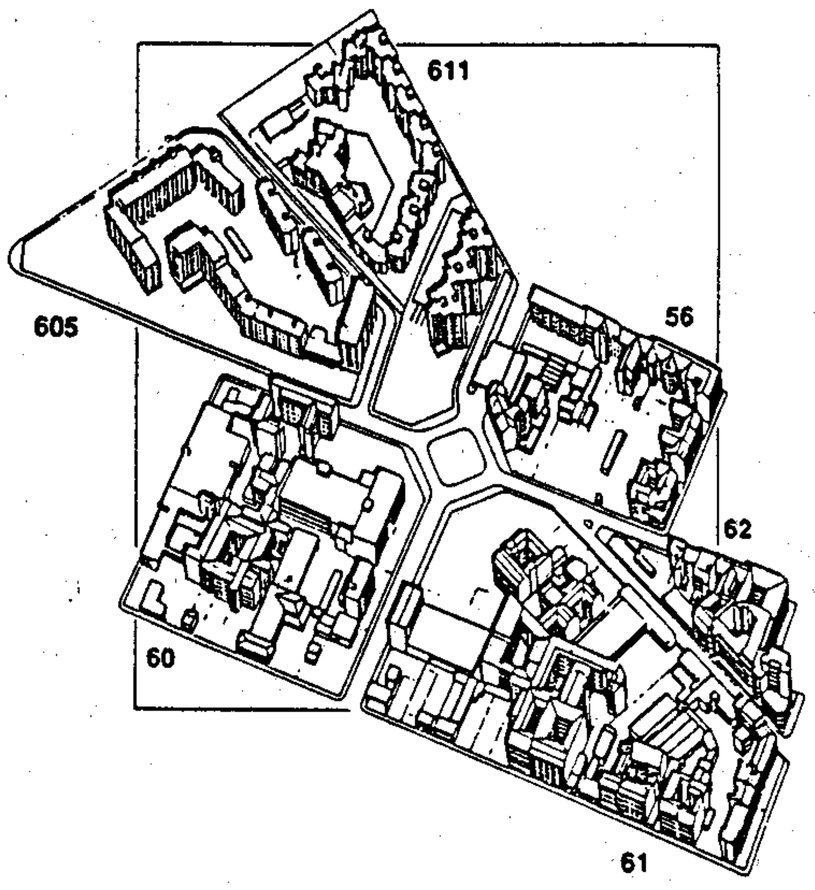
- built at the end of the 50s; terraced construction (up to 8 storeys) with interspersed greening
- open areas largely non-tiled and greened
- residential use except for shops on ground level

Block 611: new housing complex

- built in the 70s
- open ended structure with enclosed courtyard in the west
- 10-storey separated highrise flats in the eastern part of the complex
- residential usw except for a kindergarten and a cafe/shop
- high proportion of ineffective green areas (50 % is on tiled surfaces)

Position in the City





Planned Measures and Building Blocks (1988)

Building Block: Environmental Communication

- environmental consultants for local business and private households
- special courses in local schools
- new qualifications for selected employees, house keepers
- exhibitions, info materials, actions
- participation

Building-Block: Eco-Station

- center for ecologically-oriented products and services (food, bicycles, repair etc.)
- infrastructure for cultural events
- local base for consultants
- show-rooms for environmental techniques
- laboratory for environmental analyses

Building-Block: Waste

- concept of waste avoidance for trade and people
- introduction of separate collection (glass, paper, organic waste, textiles and metals)
- composting organic waste
- separate collection of hazardous materials
- the guarantee of infrastructure and counselling

Building-Block: Building Biology

- building mamterials: wood and plain bricks
- heating with radiant heat
- considering acoustics, light, air, colour
- visibly circulating water
- adjustable ventilation, electric light, athmosphere
- favourable electro-statics, electro-dynamics

Building-Block: Energy

- improvement of thermal insulation/double glazing
- consumption based heating bills
- passive use of solar energy
- optimization and reduction of energy consumption
- connection to the district heating and electricity system for two firms

Building-Block: Water

- water-saving measures: 6 lt. flush-flow regulators in toilet tanks; flow control; cold water meter in the apartment; pipe in pipe system (special pipes for process water for later update)
- desealing of surfaces
- roof/facade vegetation
- rainwater usage
- groundwater usage
- process water system

Building-Block: Urban Green Planning

- individual garden space for tenants
- communicative places, block parks, children's and adult's playgrounds
- tenant's participation in planning and cultivation
- wet biotopes, rainwater ponds, fountains, rainwater drainage above ground

Building Block: Noise Protection

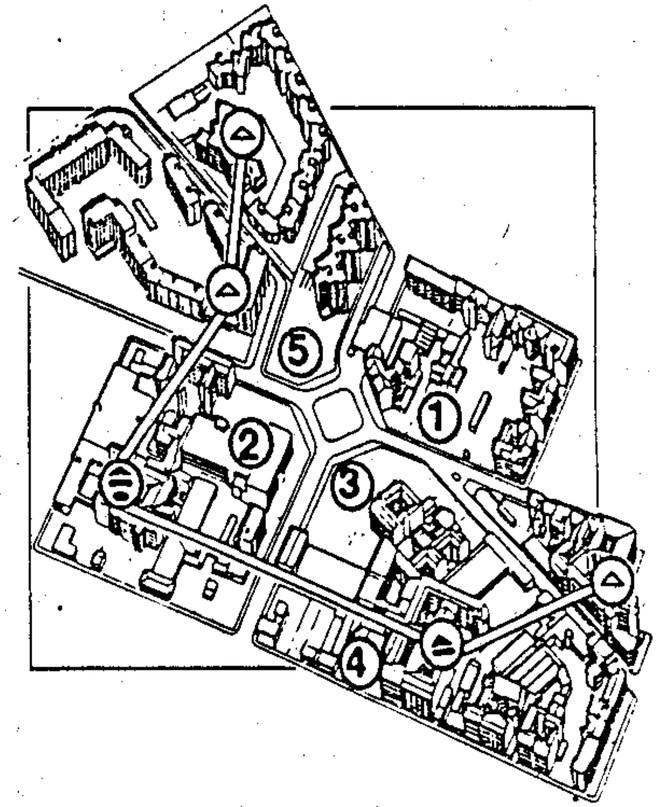
- noise prevention
- noise reduction at the source, while expanding and where it is, noise moderation

Building-Block: Traffic

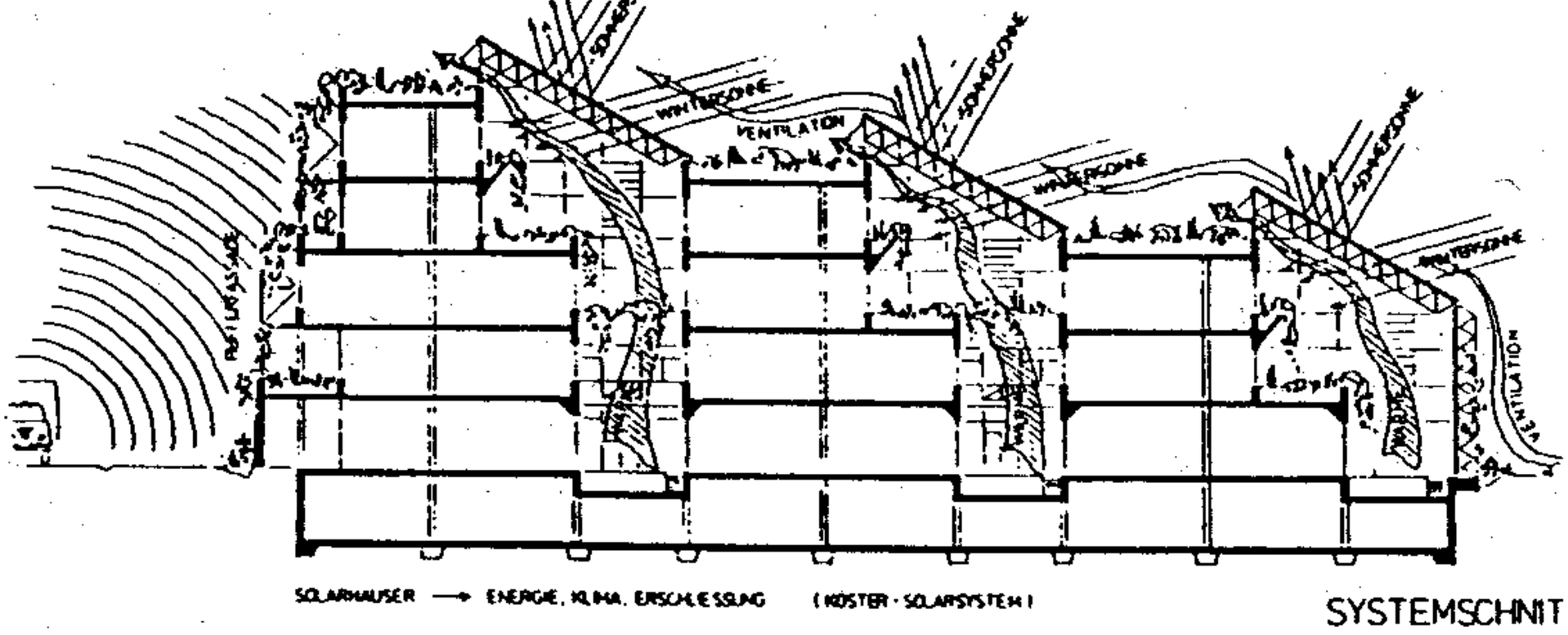
- redesign and reduction of traffic flows and road space
- reduction of parking space quotas for new buildings
- completion of pedestrian and bicycle road network, restructuring of the subway station
- restructuring of the border crossing from the viewpoints of noise, microclimate, view

Building-Block: Environmental Impact Assessment

- the ecological concepts
- comprehensive measures (e.g. process water system)
- single projects (e.g. new factory building)



Bausteln: Architektur und Bauökologie
Moritzplatz, Block 61



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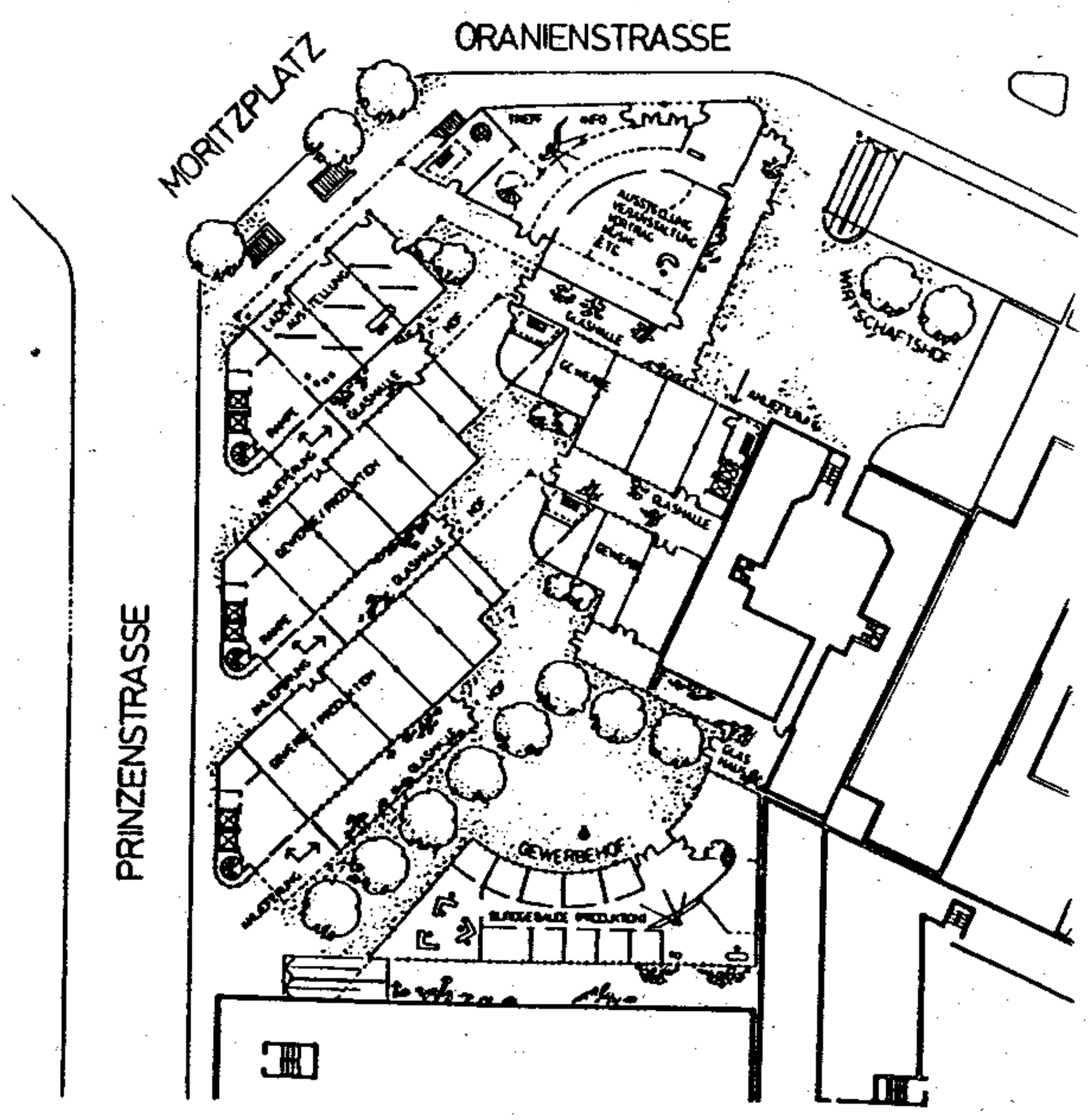

Neubau eines Handels- und Gewerbezentrums nach bauökologischen Gesichtspunkten auf dem alten Wertheim-grundstück
Testentwurf: Eble und Sambeth, 1988

SUSTAINABLE COMMUNITIES: PLANNING FOR THE 21ST CENTURY

William E. Rees and Mark Roseland

1. Introduction and Purpose

"Sustainable development" has become the rallying cry of dedicated environmentalists and trenchant industrialists alike. While this unifying power is to be admired, any concept with such broad appeal across the political-ideological spectrum merits a closer look. Is there objective meaning in sustainable development? What is the rational basis for significant changes in our approach to economic and community development? Based on a reassessment of certain key assumptions of macro- and neoclassical economics, prevailing environmental trends, and ecological theory, we develop an ecologically realistic framework for planning sustainable communities and explore some of its implications for Canadian communities in the 21st century.

2. Sustainable Development: The View from the Mainstream

The concept of sustainable development has deep roots in the theory of renewable resource management but has only recently been popularized by Our Common Future (WCED, 1987). The juxtaposition of "sustainable" with "development" inspires the enthusiasm of people on all sides of the ecology-economy debate. Any concept that implies we can eat our develoment cake and have the environment too is bound to have popular appeal.

The Brundtland Commission defined sustainable development as "development that meets the needs of the present without compromising the ability of future generations to meet their own needs" (WCED, 1987, p. 43), and argued that achieving it required "more rapid economic growth in both industrial and developing countries" (p. 87). The Commission suggested that "a five- to tenfold increase in world industrial output can be anticipated by the time world population stabilizes some time in the next century" (p. 213) (1).
Taking its cue from Brundtland, the Canadian Report of the National Task Force on Environment and Economy defined sustainable development as "development which ensures that the utilization of resources and the environment today does not damage prospects for their use by future generations". The report goes on: "current practices should not diminish the possibility of maintaining or improving living standards in the future". Perhaps most revealing is the assertion: "Sustainable economic development does not require the preservation of the current stock of natural resources or any particular mix of human, physical and natural assets. Nor does it put artificial limits on economic growth provides such growth is both economically and environmentally sustainable" (CREMM, 1987, p. 3, emphasis added).

Our Common Future and the Canadian report argue that the solution to the global ecological crisis resides within the same socioeconomic structures that seem to have created the crisis in the first place. Both documents advance economic growth as the principal vehicle for sustainability on the assumption that some of the economic surpluses will be applied to ecosystems main-

tenance. However, neither the Brundtland Commission nor the Canadian Task Force distinguish between growth which "should refer to quantitative expansion in the scale .... of the economic system", and development, which "should refer to the qualitative change in a physically non-growing economic system in dynamic equilibrium with the environment" (Daly and Cobb, 1989, p. 71). By these definitions, sustainable growth in a finite environment is a logical impossibility, but there is no contradiction in sustainable development.

There is an historical reason for this emphasis on growth. In capitalist societies, the promise of an ever-increasing economic pie holds out hope that the poor will eventually get an adequate share. The expectation of a better future reduces popular pressure for policies aimed at more equitable distribution of income.

While morally bankrupt, this "solution" to social inequity posed no survival threat to society as long as the economy was small relative to the scale of the ecosphere. This is clearly no longer the case, but neither report makes any attempt to weigh the anticipated future scale of the global economy against the finite production capacity of the ecosphere? Thus, some commentators now condemn mainstream "sustainable development" as "dangerous words now being used .... to mask the same old economic thinking that preaches unlimited consumption in the crusade to turn more land into glorified golf courses, deadly suburban ghettos, and leaking garbage holes (so-called landfill sites)" (Nikiforuk, 1990).

3. The Mechanical Economy

The contradictions in prevailing thinking can be traced to key assumptions of neoclassical economic theory, which was conceived as "the mechanics of utility and self-interest" (Jevons, 1879, cited in Georgescu-Roegen, 1975). Choosing a mechanical rather than biological metaphor for economy meant that economic theory departed from reality in three important ways. First, society tends to perceive the economy as a distinctly separate system, operating in isolation from the rest of reality. Second, economists adopted the circular flow of exchange value as the starting point for analysis rather than the one-way entropic throughput of energy and matter (Daly, 1989, p. 1). Third, the model sustains a belief that resources are more the product of human ingenuity in the form of free markets and technological substitution than they are of nature. From this perspective, resource depletion is not a fundamental problem. As with all models, this internal logic "heighten(s) the tendency to prize theory over fact and to reinterpret fact to fit theory" (Daly and Cobb, 1989, p. 38).

What does ecological theory in the real world have to say about the "internal logic" of neoclassical economics?

Economics as Human Ecology: First, far from existing in splendid isolation, the human economy is and always has been an inextricably integrated, completely contained, and wholly dependent sub-set of the ecosphere. In fact, there is little to distinguish humankind functionally from the millions of other species with which we share the planet. All species survive and grow by extracting energy and material resources from the ecosystems of which we are a part. We all "consume" these resources before returning them in altered form to the ecosphere. Since we cannot separate the economy from the ecosphere, we must restructure the relationship more on physical reality than on economic abstraction.

Economy as Consumption: Second, the ecologically relevant flows (of finite material and energy resources) through the economy are not circular but unidirectional. This is because the ultimate regulator of the economy is not mechanics but the Second Law of Thermodynamics (the entropy law): in every material transformation available energy and matter are continuously and irrevocably degraded to the unavailable state. Economic activity therefore necessarily contributes to a constant increase in global net entropy (disorder) (3).

Without reference to entropic throughput, "it is virtually impossible to relate the economy to the environment", yet the concept is "virtually absent from economics today" (Daly, 1989, p. 1). In thermodynamic terms, all economic "production" is actually consumption - this underlies our ecological crisis. Since our economies are growing and the ecosystems within which they are embedded are not, the consumption of resources everywhere has begun to exceed sustainable rates of biological production.

Obligate Dependency and the Ultimate Market Failure: Third, rising market prices may be effective at finding substitutes for resource inputs to manufacturing, but they are silent on the value of non-market resources. Unfortunately, humankind exists in a state of obligate dependency on many materials (e.g., the ozone layer) and processes (e.g., photosynthesis, climate stabilization) that the economy does not recognize as resources. Thus, contrary to expectations, as ecologically critical factors are destroyed by consumption or pollution there is no signal from the marketplace that the very basis of survival is being irreversibly eroded. Moreover, there are no technological substitutes (Rees, 1990a, c).

4. Maintaining Natural Capital to Sustain Development

Global resource depletion and pollution provide evidence of both the inadequacy of neoclassical theory on the one hand and the workings of thermodynamic law on the other. Such trends as ozone depletion (3 % worldwide in 1989) and greenhouse gas enhancement (25 % increase in carbon dioxide in 100 years) are forcing recognition that existing patterns of development and resource use are not sustainable. Various authors have therefore begun to emphasize the need to develop better ways to evaluate ecological resources to extend the time horizon for economic policy and to elevate both intra- and intergenerational equity to a place of prominence in decision-making.

Pearce et al. (1989) integrate these objectives through the proposition that future generations should be compensated for reductions in the endowments of resources brought about by the actions of present generations (p. 3 original emphasis). There are two possible interpretations: (1) each generation should inherit an aggregate stock of manufactured and natural assets no less than the stock inherited by the previous generation (Daly's [1989] conditions for "weak sustainability"); or (2) each generation should inherit a stock natural assets no less than the stock of such assets inherited by the previous generation (Daly's "strong sustainability").

The first interpretation reflects the neo-classical assumption that human-made and natural assets are substitutable and that natural assets can be liquidated as long as subsequent investment (e.g., factories and machinery) provides an equivalent endowment to the next generation. The second interpretation reflects the ecological reality we have outlined in this paper: human-made and natural capital "are really not substitutes but complements" (Daly, 1989, p. 22). In effect, strong sustainability places infinite value on key biophysical resources and systems. It requires that humankind learn to live on the interest generated by our remaining stock of natural capital (Rees, 1990a, b). Beyond an equilibrum state, additional growth is "uneconomic growth that impoverishes rather than enriches" (Daly and Cobb, 1989, p. 2) (5).

5. Developing Sustainable Urban Communities

"Strong sustainability" has serious implications for urban form, for the material basis of urban life, and for community social relationships that must be expressed as practical measures in planning Canadian communities. These measures must emphasize the efficient use of urban space, reducing consumption of material and energy resources, improving community livability, and organizing administrative and planning processes which can deal sensitively and comprehensively with the attendant socioeconomic and ecological complexities.

The Unsustainable Community: Most North American cities were built using technologies which assumed that abundant and cheap energy and land would always be available. Communities therefore grew quickly and inefficiently, and became dependent on lengthy distribution systems. Cheap energy influenced the construction of our spacious homes and buildings, fostered our addiction to the automobile, and increased the separation of our workplaces from our homes (Environment Council of Alberta, 1988).

Urban sprawl is the legacy of abundant fossil fuel and our perceived right to unrestricted use of the private car whatever the social costs and externalities. Per capita gasoline consumption in US and many Canadian cities is now more than four times that of European cities, and over 10 times greater than such Asian cities as Hong Kong, Tokyo, and Singapore. The biggest factor accounting for these differences in energy use appears to be not the size of cars or the price of gasoline, but the efficiency and compactness of land-use patterns (Replogle, 1990). One conclusion of a study prepared for the US Government was that "'sprawl' is the most expensive form of residential development in terms of economic costs, environmental costs, natural resource consumption, and many types of personal costs ... This cost difference is particularly significant for that proportion of total costs which is likely to be borne by local governments" (Real Estate Research Corporation, 1974).

Other local and regional consequences of sprawl, such as congestion, urban air pollution, jobs-housing location "imbalance", and longer commuting times are now recognizing. Yet, until recently, few researchers acknowledged that the land-use pattern of North American cities also has serious global ecological ramifications. For example, residents of most Canadian cities annually produce about 20 tons of carbon dioxide per capita, placing Canada among the top three of four nations in terms of per capita contribution to potential climate change. In contrast, citizens of Amsterdam produce only 10 tons of carbon dioxide per capita per year. Sprawl, exclusionary zoning and low density account for much of this difference (6). According to recent research at the

International Institute for Applied Systems Analysis, if North American cities modeled future development on cities like Amsterdam, future carbon dioxide emissions here would only be half as much as current gloomy projections now indicate (Alcamo, 1990).

The Sustainable Community: The post-war pattern of Western urban development is not only ecologically inefficient and socially inequitable. In contrast, sustainable development implies that the use of energy materials be in balance with such "natural capital" processes as photosynthesis and waste assimilation (Rees, 1990a, b). This in turn implies increasing community and regional self-reliance to reduce dependency on imports (RAIN, 1981; California Office of Appropriate Technology, 1981; Morris, 1982). The benefits would be reduced energy budgets, reduced material consumption, and a smaller, more compact urban pattern interspersed with productive areas to collect energy, grow crops, and recycle wastes (Van der Ryn and Calthorpe, 1986, p. ix).

Cities with low "automobile dependence" are more centralized; have more intense land use (more people and jobs per unit area); are more oriented to non-auto modes (more public transit, foot traffic and bicycle usage); place more restraints on high-speed traffic; and offer better public transit (Newman and Kenworthy, 1989). This suggests a new approach to transportation planning and traffic management in Canada. Transportation planning in the past several decades has been a largely reactive, dependent variable, driven by increasing congestion and resulting in the low-density outward expansion of the city. Transportation planning must become a determinant force, one that induces the needed change in urban form (Replogle, 1990).

The ideal urban form for a particular locale will depend to some extent on the nature of the energy-supply options: for example, higher densities make most efficient use of district heating and public transport networks, while lower densities may make solar energy more viable. The location, gross density and form of new development should therefore be determined in conjunction with programs for energy supply and conservation technologies (Owens, 1990, pp. 78 - 79). This principle is illustrated by a recent San Jose, California study which compared development pressures with or without a "greenbelt". Without it, 13,000 exurban homes would be developed, which, compared with an equivalent number of units downtown and along the transit corridor, would require at least an additional 200,000 of auto commuting plus an additional three million gallons of water every day, as well as requiring 40 per cent more energy for heating and cooling (Yesney, 1990).

Another study, by Montgomery County, Maryland, found that continued growth in an automobile-dependent pattern would produce traffic congestion levels high enough to choke off economic development. However, an anticipated doubling of population and employment could be accomodated without excessive traffic problems if most new growth were clustered in pedestrian- and bicycle-friendly centers focused on an expanded rail transit and busway system. Through such strategies, the share of County work trips made by non-auto alternatives could double to 50 % resulting in only half the level of energy use and air pollution compared with the sprawled, automobile strategy (Replogle, 1990).

Such studies demonstrate that the pattern of growth is more important than the amount of growth in determining the level and efficiency of resource use and traffic congestion.

6. Local Initiatives for a Sustainable Future

Although "environmental concerns" currently top the polls, resistance to changing specific behaviours and development practices may be formidable, as evidenced by the global debate over whether to adopt, and how to implement, a 20 % reduction in carbon dioxide emissions (Rees, 1990d). The US Environmental Protection Agency has estimated that merely to stabilize atmospheric concentrations of CO2 at the current level, carbon emissions must be cut by 50 - 80 %. Scientists and policymakers meeting in Toronto in June 1988 offered a short-term goal: cutting them 20 % by 2005 (Toronto Conference Statement, 1988, Flavin, 1990). Meanwhile, Canada is considering whether merely to freeze emissions at 1988 levels by 2005.

International bodies and national governments struggle to formulate policies to achieve this goal, but it is at the community level where most of these initiatives will have to be implemented. Many local governments have therefore started taking action singlehandedly (see City of Vancouver, 1990). They recognize that net fiscal, economic, and ecological benefits will accrue to those who get their environmental house in order. For example, most energy dollars leave the local community. Shifting purchases from energy to retail sales, for example, is more likely to result in the retention of dollars in the local economy and produce a larger multiplier effect.

In Tables 1 through 5, we outline several kinds of initiatives which could be adopted or adapted by municipal and other governments in Canada to satisfy the criteria of land-use efficiency, reduced consumption of resources, and improved community livability. We also indicate implementation mechanisms and jurisdictions in which these initiatives are being practised or proposed (7). In countries where federal initiatives have resulted in several local government responses, the names of the country is given.

Summarizing Actions and Directions: From Tables 1 and 2, we determine that land-use planning and controls must be created or strengthened (see e.g., Richardson, 1989) (8). Energy-efficient land-use policies must be developed to reduce the need for transportation (Federation of Canadian Municipalities, 1990). Grants and loans for transportation investments should be tied to compliance with requirements for regional land-use planning and growth management. Sprawl should be attacked by setting maximum expansion limits and favouring growth near transit stations. Metropolitan planning should shift from access by transportation to access by proximity (City of Vancouver, 1990).

Automobile trip-reduction by-laws, road pricing, preferential parking, regional carbon dioxide taxes, street redesign and traffic calming, and all measures to encourage public transit and bicycle transportation, should be actively encouraged. Governments, investors, and banks should require analysis of alternative long-term least-cost strategies for transportation and land-use investments. Long-term least-cost strategies would tend to give pedestrians, cyclists, and public transportation priority over the automobile. They would favour the building of surface light rail and bikeway systems connecting higher density pedestrian-friendly city and suburban centers. They would favour the building of bicycle parking garages. They would lead to policies that slow down car traffic to improve conditions for pedestrians and cyclists (Replogle, 1990).

From Tables 3 and 4, we determine: Energy efficiency should be increased in all sectors to reach specific targets, e.g., 20 % by 2000. Energy conservation retrofit ordinances and renewable energy technologies should be encouraged and financially supported. Packaging restrictions should be adopted, along with ambitious goals to reduce, reuse, reprocess and recycle waste.

Initiatives cited in Table 5 demonstrate: Efforts to fulfill human needs, improve social equity, and provide for social self-determination can and must be pursued in concert with initiatives to maintain ecological integrity (Gardner and Roseland, 1989a). Many of today's health problems - cancer, heart disease, emphysema, car accidents - have lifestyle and environmental causes. Reducing these threats involves traditional preventive measures that parallel and reinforce environmental objectives (see e.g., Boothroyd and Eberle, 1990, Mathur, 1989, Lane, 1989).

From a fiscal perspective, the policies and public programs described above will save city operations thousands or even millions of dollars annually. Several of these are fee fundable, and so do not compete for general revenues. These policies and initiatives are proving effective. As a result of a 1989 CFC by-law, the City of Irvine, California reduced local emissions of ozone-depleting chemicals by 46 % in just one year. Within the first year of Mexico City's 1989 "Hoy No Circula" (Day Without A Car") program, the city recorded a 23 % reduction in air pollution emissions. As a result of bicycle transportation incentives, bicycle commuters now account for more than 40 percent of passenger trips in some Dutch cities. As a result of integrated transportation and land-use planning, most people in Curitiba, Brazil prefer mass transit for routine urban travel, despite one of the highest rates of motor vehicle ownership per capita in the country (United Nations Environment Program, 1990, Bleviss and Walzer, 1990).

7. Equity and Social Factors

Planners and policy analyses are rightly concerned about the dislocations, economic costs and potential inconveniences associated with the above measures and their distribution across society. Polls do suggest that the public is willing to make some sacrifice to achieve ecological stability. However, both the gain and the pain of adjustment should be shared fairly by community members. Participation in the decision-making process by affected groups "can help make the attendant redistribution of costs and benefits fairer and more widely understood. Democratic mobilization is essential to the achievement of such policies in the face of the opposition [by vested interests they] inevitably engender" (Paehike and Torgerson, 1990, pp. 50 - 51).

The employment impacts of sustainable policies are a frequent concern and highly variable. For example, mandatory container reuse and recycling, many energy conservation measures, and enhanced public transportation may involve more rather than fewer job opportunities, while energy efficiency standards for appliances and automobiles may be employment-neutral. Where there are significant dislocations, special job training programs and new forms of social nets may have to be implemented to serve those people in transition from unsustainable forms of employment.

Many other sustainability measures are inherently positive in their distributive effects. For example, more efficient land use and tax policies to discourage land speculation will increase the affordability of housing in the city and enable people to live closer to work. Shifting some of the public subsidy from automobile use to improved public transit will improve access to the city for

lower income groups while attracting more riders from all social strata. All such effects are much in need of further research. However, in the final analysis, to the extent that improving the health, access, and livability of our cities contributes to the long-term survival of society, we all benefit in equal measure.

8. Administration for Sustainability: Reinventing the Wheel or Just Spinning it?

Administration for Sustainability includes environmental commitments and legislation, investment and purchasing/procurement policies, environmental education, environmental enforcement, environmental management practices, sustainable community planning processes, and co-operative research. Table 6 presents our findings on these aspects.

While progress in environmental management appears to be the order of the day, a look at even recent history gives cause for concern. For example, in 1990 Toronto made headlines around the world by becoming the first city to commit itself to reducing its 1988 level carbon dioxide emissions 20 % by 2005. Included in its "call for action" was a goal of "significantly reducing the number of commuting autos" and a strategy to "promote significant reductions in the energy intensity of transportation in the city" by promoting public transit, bicycling and walking (City of Toronto, 1989, pp. 6 - 9). Yet ten years earlier Toronto City Council had passed an energy conservation by-law designed, among other things, to encourage development and redevelopment that would contribute to energy-efficient urban form, reduce the need for transportation, discourage automobile use and encourage public transit and bicycle transportation (Lang and Armour, 1982, pp. 63 - 65).

Another example of purported progress is the recent mushrooming of municipal and local government environmental departments, co-ordinators, task forces, staff committees, and citizen boards. At one level this is certainly deserving of applause. Yet a major survey of environmental management in nearly 3,000 North American local governments in 1973 found that 20 % had staff environment committees. 40 % had designated environmental co-ordinators, and 24 % had citizen environmental boards. Inadequate funding, uncertainty and delay in program administration, inadequate communication with senior levels of government, and inadequate technical assistance were all perceived in the mid-1970s as major impediments to adequate local responses to environmental problem-solving (Magazine, 1977, pp. 17 - 31, 67). Nearly 20 years later, this list sounds all too familiar.

The concern that we may be both reinventing and spinning our wheels is clearly not unfounded. Conventional wisdom considers the environment as an administrative problem, to be solved by better management. Better management is understood, in this context, as cutting the environment into bite-size pieces, an approach which appears increasingly unable to deal effectively, sensitively and comprehensively with environmental complexities (9). Rather than the environment as an administrative problem, it would appear that administration is itself an environmental problem (Paehlke and Torgerson, 1990, p. 113).

9. Public-Community Partnerships

The alternative to conventional urban administration is an emerging form of what has been called "environmental administration". It can be characterized as non-compartmentalized, open, decentralized, anti-technocratic, and flexible (Paehlke and Torgerson, 1990, pp. 292 - 299) (10).

Like other levels of government, the institution of local government has many limitations, not least among them resources, jurisdiction, inequitable representation and the reductionist administrative mindset. It will take a great effort over a long time to turn the system of local government into a paragon of environmental administration, though try we must. In these transition decades, however, an effective and popular way to implement sustainable community development is urgently required. One attractive option for this is what we call "public-community partnerships" between government and decentralized, flexible, locally-controlled, democratic and open community institutions to implement sustainable development at the community level.

Community land trusts may be the best examples of such sustainable community development institutions. A community land trust is an organization created to hold land for the benefit of a community and of individuals within the community. It is a democratically structured, nonprofit corporation, with an open membership and a board of trustees elected by the membership. The board typically includes residents of trustowned lands, other community residents, and public-interest representatives. Board members are elected for limited terms, so that the community retains ultimate control of the organization and of the land it owns (Institute for Community Economics, 1982).

There are now many successful community land trusts in both rural and urban areas in the United States. The model is being used both by neighborhoods concerned with affordable housing and by organizations concerned with the plight of agricultural lands and wilderness. However, for these kinds of institutions to have an appreciable effect on developing sustainability, public powers and public funds will be required for their creation and expansion. Supporting legislation and programs of start-up funding and technical assistance from any or all levels of government could enable these institutions to flourish, as they are in some New England cities and states (Seidman, 1987). With such public-community partnerships, these community-based institutions could become an effective, decentralized, locally controlled and politically popular way to implement sustainable community development (Gardner and Roseland, 1989b).

10. Conclusion

Sustainable development means looking ahead to the opportunities and constraints that will face us tomorrow, not merely those that face us today. In the 21st century, the single greatest change in our collective consciousness may well be the redefinition of our concept of security. Security is no longer the exclusive domain of economists and generals: environmental threats to security are as serious as economic challenges and military conflict in the new global order, and they require as much political and civic attention. In the final analysis, we are only as secure as the ability of the planet to provide us and our children with healthy air, water, food, energy and other life-support essentials.

Planning for the 21st century means developing communities to be sustainable in global ecological terms. The kinds of initiatives we have described here are sometimes perceived as economically costly and socially disruptive. However, if the logic of "strong sustainability" is correct, they are not only essential to maintaining civilization, but will also improve the quality of urban life. Sustainable communities will be cleaner, healthier, and less expensive, they will have greater accessibility and cohesion; and they will be more self-reliant in energy, food and economic security than our communities now are.

With their relatively wealthy and well educated populations, Canadian communities have a moral obligation to demonstrate leadership in (and consequently benefit from) developing the knowledge, technologies, and processes which the world requires for sustainability in the 21st century. The models and strategies exist for innovative provincial planning programs, for local government initiatives, and for public-community partnerships with the nonprofit sector. More than ever before, public interest and political will are supportive. Planners have an special obligation and ability to frame issues, assume leadership, champion initiatives, and demonstrate sustainable alternatives in their everyday practice. With creative leadership we may yet be able to leave our children a legacy of which we can be proud.

Notes

1. The WCED's apparent belief in growth-as-solution may reflect a genuine faith in the economic growth ethic. Alternatively, it may have been a necessary ploy to increase the political acceptability of the Commission's findings and to stimulate the present debate.

2. Note that macro-economic theory, implicit in both WCED (1987) and CREMM (1987), has nothing to say about the appropriate scale of an economy. The question has not been considered relevant.

3. For example, a finished automobile represents only a fraction of the energy and material that has been permanently dissipated (as pollution) in the manufacturing process.

4. "Equivalent endowment" would be defined in terms of monetary value, wealth generating potential , jobs and similar economic criteria.

5. The accelerating rate of decline in existing stocks of natural capital suggests that even present human populations, material standards, and technologies exceed the Earth's long-term carrying capacity.

6. Other factors have also influenced the compact development patterns of the world's Amsterdams, e.g., historically higher energy prices, more efficient automobiles, lower rates of automobile ownership, and a tradition of support for public transit and bicycle transportation. These factors certainly reinforce compact development patterns; however, they are more likely to result from compactness rather than cause it.

7. The jurisdictions are cited as examples: these are not intended to be comprehensive listings.

8. Oregon's system of Statewide Planning Goals is a good model for comprehensive land-use planning. The State sets mandatory goals (e.g., to provide for widespread citizen involvement; to preserve and maintain agricultural lands; to conserve energy), which are general standards for land-use planning. Planning remains the responsibility of city and county governments, but it must be done in accordance with these statewide standards (Rohse, 1987).

9. One exception to this might be California's South Coast Air Quality Management District (SCAQMD), a powerful agency with the responsibility for comprehensive air pollution control and the duty to represent the citizens of the South Coast Air Basin (SCAQMD, 1989). However, it must also be noted that the context for these powers is that the South Coast Air Basin has the most serious air quality problem in the U.S.

10. The sustainable development "round tables" now underway in several Canadian jurisdictions could become a leading example of environmental administration if (1) they actually had significant decision-making powers, and (2) the people most affected by such decisions (e.g., workers, community residents) participated in those decisions. The prospects, however, are not good. The model for these round tables, the CCREM National Task Force on Environment and Economy, was an advisory body that completely excluded representatives of organized labour.

TABLE 1

Efficient Use of Urban Space
Transportation Planning and Traffic Management Initiatives

Initiative	Purpose	Mechanisms	Practiced/Proposed
Trip Reduction By-Laws	To reduce peak hour trips and increase the ratio of people to vehicles.	Require employers to implement a program, including appointment of a transportation co-ordinator and any reasonable combination of commute alternatives designed to achieve the required target.	Vanvouver; Bellevue, WA; Montgomery County, MD; 37 California cities and counties
Automobile Restrictions	To reduce urban air pollution, traffic congestion.	Prohibit automobile use one or more day per week; fuel taxes.	Florence; Budapest; Santiago; Mexico City
Road Pricing	To reduce car traffic in urban centres; also being used to fund public transit.	All drivers entering the city centre are required to display a valid monthly transit pass or other sticker.	Singapore; Hong Kong; Holland; Stockholm; Vancouver
Parking Measures	To favour high-occupancy vehicles over single-occupancy vehicles.	Preferential parking, parking pricing, parking offsets.	Ottawa; Vancouver; Portland, OR; Seattle, WA; Montgomery County, MD; Sacramento, CA
Free or Inexpensive Transit	To encourage use of public transit.	Transit is free, at least within the downtown core.	Portland, OR
Bicycle Transportation	To make bicycling a better transportation alternative.	Car-free bicycle routes; bicycle parking; shower and locker facilities in all new developments.	Palo Alto, Davis, Berkeley, CA; Bordeaux (France); Groningen (Holland); Toronto; Vancouver
Street Redesign and Traffic Calming	To slow traffic speeds, reduce noise and exhaust, and make streets safer for pedestrians, children, seniors and bicyclists.	Woonerfen, or "slow streets," with narrow lanes, curves, speed humps, shrubbery, slow speed limits, etc.	Holland, Saarbrucken (Germany); Berkeley, CA
Telecommunications	To encourage alternatives to commuting	Determine tasks/jobs, provide training and/or equipment.	Portland, OR, Vancouver

TABLE 2

Efficient Use of Urban Space
Land-Use Planning and Housing Initiatives

Initiative	Purpose	Mechanisms	Practiced/Proposed
Proximity Planning	To make access by proximity rather than access by transportation a central focus of City planning.	Developing policies and incentives.	Vancouver
Residential Intensification	To create new residential units or accommodation in existing buildings or on previously developed, serviced land.	Creation of rooming, boarding and lodging houses; creation of accessory apartments; conversion of non-residential structures to residential structures to residential use; infill; redevelopment.	Kingston, St. Catherines, Metro Toronto
Cohousing	Participatory, intentional neighbourhood design.	Extensive common facilities; developments are organized, planned, and managed by the residents themselves.	Denmark, Holland, Sweden, Norway, France, Germany; Winslow, WA
Community Land Trusts	To hold land for the benefit of a community and of individuals within the community.	A democratically structured nonprofit corporation, with an open membership and an elected board of trustees.	Philadelphia, PA; Burlington, VT; Atlanta, GA; New York City; Greenfield, MA; Providence, RI; Franklin, NH; Norwich, CT
Rural Area Protection	To compensate for damage to natural areas.	Land reconstruction rules in the landscape plan.	Enschede (Holland)
Co-Management Agreements	To provide for a high level of user-group participation in resource decision making.	Detailed provisions for rights, obligations and rules for decision makers and resource users, plus a structure to co-ordinate decision making	Quebec, Wisconsin, Washington

TABLE 3

Reducing Consumption of Resources: Energy Conservation and Efficiency Initiatives

Initiative	Purpose	Mechanisms	Practiced/Proposed
Energy efficiency targets	To increase energy efficiency in all sectors of the City by, for example, 10%.	Municipal policy.	Portland, OR; Toronto; Vancouver
District heating and cogeneration	To combine heat and power production, reducing energy consumption and fuel emissions.	District-wide system of underground low-temperature hot water pipes supply space heating and domestic hot water to residential, commercial and institutional users.	Helsinki; Saarbrücken; Cornwall County (UK)
Municipal energy conservation campaign.	To conserve energy.	Infrared photos of energy leakage sent to each home in town by municipal utility.	Osage, IO
Energy conservation retrofit ordinances	To conserve energy.	Requires all existing buildings to be brought up to an energy conservation standard at the time of sale.	San Francisco
Solar oven cookbook	To promote solar cooking; to reduce air conditioning in overheated kitchens.	Municipal utility.	Sacramento, CA
Local energy supply concept	To reduce dependence on fossil fuels; encourage renewable resource use.	Promote direct solar, photovoltaics and district heating.	Saarbrucken
Energy-efficient neighbourhoods	To conserve energy through urban design, site planning, development controls, and energy-efficient land use planning	Solar orientation of streets, cluster development, neighbourhood-level services and facilities, increased densities, natural drainage, narrow roads, energy conservation programs; "traditional neighbourhood development" ordinances	Davis, CA, Eugene, OR, Seaside, FL

TABLE 4

Reducing Consumption of Resources: Waste Reduction and Recycling Initiatives

Initiative	Purpose	Mechanisms	Practiced/Proposed
Waste reduction goals	To recycle, compost, or avoid production in 10 years (1998) of 60% of the total combined residential and commercial waste which would otherwise be generated within the City.	Public education, curbside collection of recyclables and yard waste, commercial and apartment recycling, mixed waste processing, and possibly developing a food waste composting facility.	Seattle
Packaging restrictions	To encourage a recyclable and compostable waste stream.	Ordinance restricting nondegradable, nonreturnable and nonrecyclable food and beverage packaging — including national brands — originating at retail food establishments.	Minneapolis
"Precycling" campaigns	To educate consumers to consider waste before they buy.	Media, public events, etc.	Berkeley
Municipal composting	To reduce yard wastes and to sell dry sewage sludge as a soil amendment.	Centralized composting program for 60,000 tons of yard waste per year.	San Jose
Polystyrene plastic foam bans and restrictions	To prevent one-time use of polystyrene plastic foam by restaurants and retail food vendors.	Municipal by-law.	Portland, Berkeley
Integrated reclamation/ recycling centres	To recover and reprocess everything from glass, metals, paper and waste oil to cotton, animal bones, chemical fibres and human hair.	State complex employing 29,000 full-time and many more part-time employees through a network of purchasing stations, integrated recycling centres, sales departments and retail shops selling reclaimed products.	Shanghai
Constructed wetlands	Sewage treatment.	Treat sewage effluent through a series of natural marshes and restored wetlands	Arcata, CA
Solar aquatics waste treatment facility	Septage treatment.	Greenhouse marshes to purify wastes.	Providence, RI

TABLE 5

Improving Community-Livability

Initiatives	Purpose	Mechanisms	Practiced/Proposed
Citizen participation	To build a united, broad-based political coalition for progress on sustainable community development.	A 49-recommendation platform for the future of the city's environment agreed to by over 200 local organizations.	New York City
North-South partnerships	To co-operate on municipal environmental assessment; to promote "municipal foreign policy"; to support development education, liberation movements, and renewable energy use in developing countries.	"Twinning" or "linking" with sister cities; a local elected officials project; *The Bulletin of Municipal Foreign Policy*; an overall partnership development program.	Federation of Canadian Municipalities; US Local Elected Officials Project; Bremen (Germany)
Gender equity	To respond to the special needs of women crime victims, and to create new career paths for women.	"Delagacias da Mulher," all-female police stations.	Sao Paulo (Brazil)
"Disassembly" line	To integrate environmental and social policy.	Apprentice shop for unemployed young people where discarded bu serviceable equipment (e.g., refrigerators) is repaired and sold, and polluting substances are removed.	Zutphen (Holland)
Public-community partnerships	To work with the nonprofit sector to meet community needs.	Municipal leadership in establishing a community land trust; "linkage" programs to provide funds for affordable housing, job development and day-care.	Burlington, VT; Boston, San Francisco
Healthy Communities Projects	To promote community health.	WHO, CIP, CPHA, FCM	Canada, Rouyn-Noranda, PQ; Seattle, WA; Liverpool, Sheffield, Oxford (UK)

TABLE 6

Administration for Sustainability

Initiatives	Purpose	Mechanisms	Practiced/Proposed
Environmental commitments and legislation	To, for example, reduce the threat of atmospheric change.	Targets and by-laws to reduce or eliminate emissions of carbon dioxide, CFCs, etc.	Toronto; Irvine, CA; Vancouver
Investment and purchasing/procurement policies	To favour environmentally sound business practices; to encourage or create markets for recycled materials.	Procurement policies; codes for environmentally sound business practices, e.g., the Valdez Principles.	Ottawa, Vancouver, Los Angeles, New York City, Pasadena, Philadelphia; California, New Jersey, New York, Minnesota.
Eco-Counselors	To review the environmental impact of all municipal practices.	Recommend environmentally sound practices to various government departments.	Germany, Sweden, Switzerland, Austria, Italy, Spain, UK, France, Luxembourg, Belgium
Environmental enforcement	To improve the effectiveness of environmental policies and legislation.	Police department enforces environmental laws; environmental officers and investigation teams.	Weert and Apeldoorn (Holland); Richmond and Los Angeles, CA
Municipal Environmental Impact Assessment (EIA)	To review the environmental impact of all municipal practices; "ecological self-control" of local government.	Draft by-laws; propose grants and subsidies; build projects; review procurement policies, development and waste disposal plans.	Germany: Freiburg, many other towns
Municipal environmental management	To monitor and co-ordinate environmental management; to transcend the administrative mindset.	Ecosystem planners, environmental manager and program administrators, energy conservation offices; hiring Greenpeace activist; national programs.	Burnaby, Vancouver, Toronto; Portland, OR; Irvine, CA; Gothenberg (Sweden); Norway, Finland, Holland
Sustainable community planning processes	To encourage co-operation in the formulation of effective policies.	Local round tables on environment and economy.	Canada: Burlington, Guelph, Kitchener, Muskoka, Peterborough, Skeena
Networking and co-operative research	To share experience in the formulation of effective policies.	International Council for Local Environmental Initiatives.	Chartered 1990 by local officials from 45 countries, United Nations.

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