

To sustainability through interdisciplinary planning: A planner's perspective

Jerzy Kozlowski

Professor Kozlowski obtained his first degrees in Architecture at the University of Krakow, Poland; his Ph.D from Edinburgh University, and Dr hab. from Krakow. He is a professor in Australia and in Poland. His work has focused primarily on research in the field of urban and environmental planning methodology; promoting and sharing his research experience through academic teaching, professional training programs and workshops; and testing and applying the research results in real life. He is a member of the Association of Polish Architects, Society of Polish Town Planners, World Society for Ekistics (WSE) and Fellow of the Royal Australian Planning Institute. The text that follows is a slightly edited and revised version of a paper intended for presentation at the WSE Symposium "Defining Success of the City in the 21st Century," Berlin, 24-28 October, 2001.

Foreword

There are many terms describing planning for human settlements. The term "Town and Regional Planning" has been commonly used in the British Commonwealth countries while "Urban Planning" and "Land Use Planning" have been more popular in the USA. Other frequently used terms are: "Physical Planning"; "Town and Country Planning"; "Spatial Planning" and "Settlement Planning" – a favored UN term.

In Queensland, the recent *Integrated Planning Act 1997* applied the term "Environmental Planning," also well known, which was defined by the International Union for Conservation of Nature (IUCN) as: "... a process whereby regional, national or subnational resource conservation or development plans are created in ways that consciously seek to minimise long term negative effects on existing levels of environmental quality ..." There are, however, views which consider Environmental Planning as all types of planning, that is, including planning for regions, towns and settlements of various kinds (see, for instance, FALUDI, 1987, EVANS, 1997, or the actual New South Wales planning legislation). For this paper, originated in Queensland, the use of the term "**planning**" was thought the appropriate choice.

Opening remarks

A dynamic and expanding development of planning throughout the past century cannot be denied. But its critique, often quite strong, must be also recognized with particular attention going to claims that a significant share of planning "output" – that is, of strategic development control, local or regional plans, numerous planning studies and/or more scientifically oriented products in the form of papers, articles and research

publications – has been of negligible use in the process of solving everyday and/or long-term problems facing communities and their environment. Such a critique, especially coming from widely differing lobbies, should not be ignored, even if considered outlandish and far-fetched, as there can be no doubt that the prime responsibility of planning is not producing plans and studies of various kinds, or writing books and papers, but rather using them as tools to assist in solving specific social, economic and environmental problems, that exist now or can be anticipated to appear in the future.

Historical development and the present state of planning imply that its main concerns were always the development processes of settlement and settlement systems at all levels, together with their impact on the natural environment, the state of the economy and the quality of human life. Development is a multicomplex process and, in its essence, planning has usually been recognized as responsible for the coordination of development both in space and time.

Planning evolved, generally, from architecture but, later, other disciplines became entangled in it because of their interest in various aspects of development and, at present, the prime responsibility of planning cannot be discharged without close affinity with and knowledge of economic, managerial, ecological, technological and social issues. Such a very large field has compelled planning to evolve as, primarily, a generalist activity that must examine development from a wide range of viewpoints coming from many disciplines, and then try to integrate this very broad spectrum into planning decisions.

At the same time, both science as a whole and many professions started to become more and more specialized and polarized with several disciplines showing a tendency for splitting and, thereby, further narrowing their sphere of concern. New disciplines emerged and expanded into new fields that led to the growth of a "jungle" of terminology and axioms superimposed upon an array of disciplines, previously homogeneous and well established. Nevertheless this tendency, which derived from an urge to go deeper and deeper into the unknown, has been logical and proper in most cases. However, it should not be overlooked that the greater became the number of new, highly specialized disciplines, the greater the need for generalization and integration. A tendency to specialize could have been noted in planning as well, since its very character called for planning problems to be, as a rule, considered in a wider setting. In planning, therefore, there was always a continually developing need, not only to prevent the narrowing tendencies, but rather to promote those tendencies associated with generalization. As a consequence, it can be put forward that the narrow, specialized avenues in planning be left in the hands of scientists and/or professionals from other, affiliated

disciplines while planners concentrate on:

- formulating questions directed to those disciplines to indicate specific problems that require an interdisciplinary examination, but in the context of planning tasks; and,
- widening their knowledge of development processes and their implications, but based on the results of and the perspective from other disciplines.

This implies that an ability to formulate the right questions is critical for both sides and it seems to be often more important than finding the right answers, as once the right question is posed, sooner or later, someone will come up with the right answer, while a right answer to a wrong question simply does not exist. Similarly important is the ability to listen to questions asked by others and, as a consequence, to make necessary adjustments. Therefore, formulation of questions seems to be one of the prime requirements and skills of contemporary planning and essential for its evolution.

Achieving a comprehensive knowledge of development processes appears, in turn, unattainable by individual planners, and one of their basic skills must become a capacity to synthesize and integrate the results of research, retrieved primarily from other disciplines, into a coherent whole.

All that leads to another logical conclusion, which is that learning about the methods and findings of other disciplines becomes a prerequisite of almost any responsible planning research and practice. This may be best accomplished by interdisciplinary cooperation and understanding between various specialists or various scientific and/or professional disciplines (KOZLOWSKI, 1988).

The real life context

Environmental crisis and its roots

There are two main and global groups of problems faced by most countries today:

- widespread and increasing poverty, usually interrelated with high unemployment, rising crime, or poor public health; and,
- a continuing degradation of the natural environment threatening the very survival of humankind.

A solution to problems in the first group is, in particular, to speed up economic development through strengthening economic growth, restructuring economies, restoring balance of payments and increasing Gross National Product (GNP), while a solution to problems in the second group depends primarily on reversing processes that cause deterioration of natural resources, degradation of land, loss of species, negative climatic changes and pollution in all forms.

As a consequence, a major conflict unfolds because economic development and associated growth, considered as leading instruments in the fight against poverty and for an improved quality of life, rely heavily on the exploitation of natural resources, such as air, water, soils, plants and animal species, all of which have been sustaining life for millions of years and which are under threat of becoming irreversibly damaged or totally destroyed.

Thus questions arise: What is development and how should it be defined? Is the increase of real income its main objective and measure of success? Can its adverse environmental effects be avoided or, at least, minimized?

Development was defined by the International Union of Conservation of Nature (IUCN, 1980) as "...financial, living and non-living resources to satisfy human needs and to improve the quality of human life..." The definition is still valid and development must, therefore, be seen as an intrinsic feature of our civilization and the cornerstone of progress, expressed pri-

marily by welfare improvement in the community. The price of this progress, however, is becoming higher and higher. Development does not necessarily indicate growth but should rather be understood as "... the realisation of specific social and economic goals which may call for a stabilisation, increase, reduction, change of quality or even removal of existing uses, buildings or other elements, while simultaneously (but not inevitably) calling for creation of new uses, buildings or elements ..." (KOZLOWSKI and HILL, 1993). Definitely, it should never be seen as only a synonym of growth.

Development is realized through *changes* in the existing natural environment and these changes both involve costs and bring benefits. Costs are not only economic but also social and ecological. The latter often have damaging effects on this environment. The environment and the economy *necessarily interact* as economic systems impact on the environment by using up resources, by emitting waste products to receiving environmental media or by affecting the functioning of the environment as the global life-support system on which we all depend. As a consequence, a continually worsening, major environmental crisis has been developing over the past decades and the main natural resources, which have been sustaining life for millions of years, are now under threat.

To reverse these catastrophic trends environmental concerns must be integrated into economic policy from its highest (macro) level to its most detailed (micro) level. There is, therefore, an urgent need for a shift in the way economic progress is pursued and in the way development planning is carried out.

It is wrong to assume that this can be achieved by the free market alone because it has been, primarily, designed to address the short-term issue of the optimum allocation of scarce resources and because it will never tell when the development must stop for ecological reasons or how much enough is enough. The economic process must also not be seen – as is often the case – as a closed loop between production and consumption in which nothing is used up. In reality there is a flow of matter and energy from resources to pollution but resources are priced at the cost of extracting them and not for their replacement – a clear "theft" from the future.

Compensation for the future must, therefore, be focused not only on man-made "capital wealth," but also on "environmental wealth." However, at present, many of the natural resources – and services they provide – are treated as so-called "free goods" because no market place exists in which their true values can be revealed through acts of buying and selling. In addition, economic growth has been measured by such misleading indicators as the GNP, which is constructed in a way that tends to divorce it from indicating the real standard of living and quality of life of the population. For instance, if pollution damages health, and health care expenditures rise, the GNP goes up implying, quite wrongly, a rise in the "standard of living," not a decrease as is really the case (PEARCE et al., 1989). All that has been known and documented for years. Over a decade ago main world organizations indicated an urgent need to introduce new, true measures of economic well-being including "... increases in natural assets minus depreciation of natural assets minus defensive expenditures against environmental damage minus the costs of unmitigated environmental damage..." (IUCN, UNEP and WWF, 1991).

The way to recovery: "sustainable development"

The environmental crisis is certainly *global*: human civilization is about to destroy itself by destroying the natural resources on which its existence is based. Hence, not only scientists but also politicians across the world have begun to take note of this new ecological challenge and have taken preliminary steps towards devising a potential strategy to control the threats involved.

A fundamental question is whether development can continue to achieve its ends while, at the same time, its negative impacts are reduced to the level at which they will no longer be a major threat to human survival. This question was first confronted by the World Conservation Strategy (WCS) in 1980, where a fresh approach to the problem was launched on the ground that "... development and conservation are equally necessary for our survival and for the discharge of our responsibilities as trustees of natural resources for the generations to come ..." (IUCN, 1980). This statement led to the idea of "sustainable development" and the idea of the integration of development with conservation.

The WCS defined conservation as "... the management of human use of the biosphere so that it may yield the greatest sustainable benefit to present generations while maintaining its potential to meet the physical and intellectual needs of future generations ..." The strategy indicated that "... for development to be sustainable it must take account of social and ecological factors, as well as economic ones; of the living and non-living base; and of the long term as well as the short term advantages and disadvantages ..." and set three fundamental goals for ecological sustainability:

- the maintenance of essential ecological processes and life support ecosystems;
- the conservation of biodiversity; and,
- the sustainable utilization of species and ecosystems.

The main and commonly recognized goal of sustainable development, formulated and widely promoted by the so-called Brundtland Report, is primarily to achieve a reasonable and equitably distributed level of economic well-being that can be perpetuated through "... development that meets the needs of the present without compromising the ability of future generations to meet their own needs ..." (WCED, 1987). Clearly, if that goal is to be achieved, sustainable development must be based on *both* conservation and development and must integrate "ecological" sustainability with "economic" sustainability. The goal had deep impact on the understanding (and also misunderstanding) of the sustainability concept. Yet, it was also a subject of strong criticism as it was seen as advocating too much economic growth as necessary to achieve sustainable development, but without any attempts to redirect this growth. It failed, for instance, to indicate the importance of recognizing the urgent need for a new approach to "environmental accounting" by requesting that a proper "pricing" of the use of such free goods as water or air be urgently introduced.

Further milestones on the "road to recovery" were, among others, such international agreements and conventions as the 1987 Montreal Protocol to reduce CFCs, the 1988 First World Conference on "The Changing Atmosphere" and the 1992 UN Earth Summit in Rio directing its focus to treaties on biodiversity, climate change and the so-called Agenda 21 addressing the problems of the 21st century. Primarily, however, though with many controversies, the summit "... marked the beginning of a continuing dialogue between the rich and the poor nations over the management of the Earth..." (PICKERING and OWEN, 1994).

Among many definitions of sustainable development the one proposed by the Strategy for Sustainable Living – a follow-up to the World Conservation Strategy – is particularly relevant for physical planning as it considers that the main aim of sustainable development is "... improving the quality of human life while living within the carrying capacity of supporting ecosystems ..." (IUCN, UNEP and WWF, 1991). The concept of "carrying capacity" is directly linked with that of the *final limits* of the Earth's ecosystems to the impacts they can withstand without irreversible damage while the expected services of supporting ecosystems clearly depend on *conservation of biodiversity*.

Traditional free market economists do not recognize any "limits" to economic development and believe it can go exponentially forever. However, advocates of sustainability (DALY and COBB, 1989; PEARCE, 1989; BARROW, 1993) agree that there are final, or critical limits (constraints, thresholds) to what the natural environment can take or provide, that they determine the carrying capacity which cannot be continually violated without a threat to our survival, and that science and technology can never provide effective means of permitting the extension of these limits indefinitely.

Conservation of biodiversity is, in turn, essential for a continuous supply of:

- *renewable resources* such as fish stocks, forests, domesticated and wild animals, which provide the basis for food and cash crops supporting a wide range of human activities, or soil ecosystems which are particularly essential for crops and forests;
- *environmental services* which are of paramount importance for human prosperity; for instance, a forest provides not only wood but also the services of water storage and flood management while other biological systems break down pollutants and recycle nutrients thus absorbing the waste products of economic activities; and,
- *life-support ecosystems* such as those providing one of nature's most critical continuing exchange of carbon dioxide and oxygen among plants and animals.

Renewable resources are essential for human prosperity, but without environmental services and life-support ecosystems, which cannot be replaced, life on earth would not be able to continue in its present form if at all (MUNASHINGHE, 1994; HAWKEN et al., 1999). An overall conclusion is that achieving sustainable development means to ensure that both its ecological and economic sustainability be achieved at the same time.

The future promise: "natural capitalism"

An important milestone on the road towards sustainable development can be linked with the recent development of a new and revolutionary concept called "natural capitalism" (HAWKEN et al., 1999). Its proponents convincingly argue that the changes needed to achieve ecological and economic sustainability could come about within the next decades as the result of economic and technological changes already in place. However, for this to happen it is necessary for the existing industrial systems, which have reached pinnacles of success in commanding human-made capital, to recognize that it takes place at the cost of rapid decline of natural capital on which economic prosperity largely depends. Clearly, limits to this prosperity would increasingly be determined by natural capital rather than industrial proficiency.

Natural capitalism goes beyond the traditional definition of capital as "accumulated wealth in the form of investments, factories, and equipment," by stating that the economy needs the following four types of capital to function properly (HAWKEN et al., 1999):

- human capital, in the form of labor and intelligence, culture, and organization;
- financial capital, consisting of cash, investments, and monetary instruments;
- manufactured capital, including infrastructure, machines, tools and factories;
- natural capital, made up of resources, living systems, and ecosystem services ..."

Yet, all environmental reporting and scientific research confirm that "... the decline in every living system in the world is reaching such a level that an increasing number of them are starting

to lose ... their assured ability to sustain the continuity of the life processes. We have reached an extraordinary threshold ...” (HAWKEN et al., 1999).

Recognition of this reality led to the rise of natural capitalism, which is expected to supersede the conventional, industrial capitalism, which violates its own fundamental principles when it liquidates its prime capital (natural) and calls it *income*. This happens because conventional capitalism accepts that the natural capital, that is, natural resources and their services, are so-called “free goods.” As a consequence, no value has been assigned to the largest, natural stock of capital employed in development processes.

The proponents of natural capitalism ask, therefore, such questions as: “... What would our economy look like if it fully valued all forms of capital, including human and natural capital? What if our economy were organized ... around the biological realities of nature? What if Generally Accepted Accounting Practice booked natural and human capital not as a free amenity in putative inexhaustible supply but as a finite ... actor of production? What if ... companies started to act as if such principles were in force?...” And they answer that “... this choice is possible and such an economy would offer a stunning new set of opportunities for all of society, amounting to no less than the next industrial revolution ...” (HAWKEN et al., 1999).

The movement towards natural capitalism had been simmering for quite a while to burst out through the “1997 Carnoules Statement” directed to governments and business leaders by the international Factor 10 Club (founded in 1994 in Carnoules) which, among other things, called for a leap in resource productivity to reverse the growing environmental damage and claimed, in its opening “prophesy,” that: “... Within one generation, nations can achieve a ten-fold increase in the efficiency with which they use energy, natural resources and other materials ...” (FACTOR 10 CLUB, 1997).

To increase resource productivity meant achieving the same amount of utility or work from a product or process while using less material and energy. Adhering to the spirit of the Statement, Hawken et al. (1999) introduced four strategies for the implementation of natural capitalism, based on a fundamental principle that countries, companies and communities operate as if all forms of capital were valued. It is affirmed that the strategies “... can reduce environmental harm, create economic growth, and increase meaningful employment ...”

The strategies are:

- **Radical Resource Productivity**, which is the cornerstone of natural capitalism because using resources more effectively
 - slows resource depletion at one end of the value chain,
 - lowers pollution at the other end, and
 - provides a basis to increase worldwide employment.
- **Biomimicry**, which eliminates the very idea of waste by re-designing industrial systems on biological lines enabling the constant re-use of materials in continuous closed cycles, and often elimination of toxicity.
- **Service and Flow Economy**, which means a shift from an economy of goods and purchases to one of “service” and “flow” wherein consumers obtain services by leasing or renting goods rather than buying them outright. Then the product is a means not an end and remains an asset leading to minimization of material use and maximization of its durability (clear incentive for improving resource productivity).
- **Investing in Natural Capital**, which works towards reversing environmental decay by reinvesting in sustaining, restoring and expanding stocks of natural capital, so that abundant ecosystem services and natural resources can be produced.

Hawken et al. (1999) present an impressive array of opportuni-

ties and possibilities that are real, practical, measured, and documented, followed by overviews of remarkable technologies that are already in practice. They all convincingly indicate that once a non-sustainable aberration of conventional, industrial capitalism – based on the premise of no value being assigned to natural capital – is abandoned, there would be no true separation between how we support life economically and ecologically. And this is the main principle of sustainable development. Thus natural capitalism can definitely be seen as the means by which sustainable development not only can, but most likely will be achieved in real life.

Natural capitalism is particularly relevant to urban development, not only regarding natural resources but also human resources and social services, as the present form of industrial capitalism equally ignores the “...valuable but unmonetised ‘social system services’ – culture, wisdom, honour, love, and a whole range of values, attributes, and behaviours that define our humanity and make our lives worth living ...” (HAWKEN et al., 1999), which are produced by human resources. As a consequence, industrial capitalism is destructive both to natural and human resources and the four strategies of natural capitalism can pave, thereby, the way to reverse the present anomalies in relation to human capital as well. A most telling example (HAWKEN et al., 1999) on how it has been done differently and with what spectacular results comes from Curitiba, Brazil, and reinforces the feeling that there is an urgent need for opening an interdisciplinary discussion on whether and how to integrate into everyday planning the ideas and main strategies of natural capitalism.

The state and role of planning

Is there any, commonly recognized, “mission” of planning in a world which is becoming increasingly complicated and overcrowded? The answer is very much related to a number of well known questions, such as:

- How many people can the earth hold?
- Will birth and death rates continue to decline?
- Can food production keep pace with population growth?
- Can technology supplement or replace today’s resources?
- What are the long-term effects of pollution on health, climate, and farm production?

A glimpse into the history

Debate over such issues has filled volumes, as scholars have been looking to the future with varying degrees of optimism or pessimism. Although there have been many controversies around numerous matters, there has hardly been disagreement on four of them:

- the speed of change will accelerate;
- our survival is at stake;
- the world will be increasingly complex; and,
- nations and world issues will be growing more and more interdependent.

The problem of solving pressure on land and natural resources caused by accelerating development, while retaining a relatively conflict-free co-existence between people, is as old as our civilization. Thousands of years ago it became clear that to properly organize space and to allocate land uses while ensuring appropriate protection of the natural environment was, in fact, a necessity of everyday life and determined its quality – comfort and convenience, in particular. To deal with these types of problems is the primary “mission” and challenge for what, over the past hundred years, has become known as “town planning.” However, planning was carried out, in fact, for much longer but people were not aware that by being in-

volved in simple, practical activities, they had, in fact, become planners. Yet how, if not as a type of planning, can a process be described, whereby primeval farmers had to define the areas to be reclaimed from the forest and later subdivided into sub-areas for crop rotation, or when it was necessary to determine the optimum location for building a house, maximizing its functional value and minimizing its potential negative impacts on the surroundings?

One may see the birth of planning in ancient Greece, but it came to be seen as an economic and social necessity after being recognized as a promising tool to put some order into the dynamic and chaotic urban sprawl characteristic of the "industrial revolution" in the second half of the 19th century. Many would consider a Scottish naturalist and sociologist, Patrick Geddes (1854-1932), as the "father" of contemporary town planning, while others would point to Arturo Soria y Mata (1844-1920), Ebenezer Howard (1850-1928), or Tony Garnier (1869-1948). Planning was established formally in 1909 when the first Town Planning Act was passed in England. Some years later one of the milestones in its evolution was a debate setting objectives of urban development at the fourth CIAM (International Congresses of Modern Architecture) in 1933. They were published as *The Athens Charter* by Le Corbusier (one of CIAM's founders) in 1943 to become, for a long time, the basic textbook of modern planning – introducing, among others, "home-work-recreation" as fundamental components of contemporary cities. Its extensive, further development, following the Second World War, led to further consolidation of planning in a form known later as "traditional planning," prescriptive in character and based on zoning and a master plan as its end products.

Although the nature and substantive focus of planning was continually discussed, for quite a while its main forms were not modified. This state of the art had, finally, to face a major challenge in the late 1950s when traditional planning started to be seriously questioned. It was the time when the world was surviving a post-war economic boom, giving rise to new disciplines, new technologies and new social "cultures." In this context planning was seen as lagging behind with its inflexible, static and, primarily, mono-disciplinary approach, detached from many real-life problems and, what was more important, from the decision-making and implementation processes.

As a consequence, several new forms of planning began to appear in the 1960s and 1970s. Some gained substantial support and had a permanent impact on the discipline of planning. Others vanished like meteors. Among those worth noting were:

- "tactical planning," goal-oriented and believing in persuasion not enforcement (GUTTENBERG, 1964);
- "advocacy planning," considering a plan as a tool to steer progress towards goals and insisting that planners be involved in implementation through negotiations, dialogue and advocacy (DAVIDOFF and RAINER, 1962; BLAIR, 1971);
- "structure planning," promoting plans of strategic character, requiring alternatives and introducing mandatory public participation (PLANNING ADVISORY GROUP, 1965; McLOUGHLIN, 1966);
- "adaptive planning," rejecting forecasting and end product while believing only in short-term planning proceeding through interactions with developers in free market conditions (FOLEY, 1964);
- "action planning," advocating integration of planning, decision making, public involvement and implementation to take place in the center of action (FRIEDMAN, 1971); and,
- "systemic planning," replacing forecasting by planning through computer simulation and modelling used to steer the development process (McLOUGHLIN, 1969; CATANESE and STEISS,

1971; CHADWICK, 1971).

These two decades marked a significant evolution in planning. Attention of planners was drawn, for instance, to the importance of goal formulation, development alternatives, public participation, integration of planning with implementation and, through promoting a system approach, to the need to see cities and multicompound organisms. At the same period, the Greek planner and philosopher Doxiadis (1968) originated "ekistics" as a science of human settlements, thereby, recognizing planning as part of science.

The professional and academic debates in the decades of the 1980s and 1990s were not so prolific in the generation of new forms but concentrated more on the very purpose of planning. One of the main questions was whether planning should preserve the status quo or rather seek to change it and how far it should adapt to different political and economic systems. Different answers were often translated into planning legislation which then determined the ways planning was practically applied in various countries.

Planning, from the 1950s, was also closely associated with so-called "urban design" which was often, and incorrectly, seen as akin to site planning and landscape design that included built elements or, at best, as a marginal discipline, applicable at individual site levels and sitting between architecture and planning. Such views have been challenged for quite a while and, recently, comprehensively repelled by Frey (1999) who considers it as a potential, major tool for guiding development towards more sustainable urban form and structure, at regional, city and local levels.

The present "state of the art"

A simple but astute synthesis of the present "state of the art" of planning evolution was recently provided by England (2001). She convincingly argued that in the recent period planning has consolidated into the three main types:

- "minimalist,"
- "instrumental," and
- "incremental."

How efficient and positive are they, regarding the overall well-being of human communities and their environment?

• **Minimalist planning:** Its main aim is to keep development of land in order while minimizing negative environmental impacts and economic loss. Its only "vision" is to prevent chaos and, therefore, minimalist planning is concerned "... more with development control on a case-by-case basis than with formulating policies and strategies to guide development ..." (ENGLAND, 2001) and, as a consequence, its main instruments became zoning and development control plans. This type of planning greatly facilitates urban development and has been well supported by the development community whenever it was applied. In Queensland, for instance, till 1997 when the *Integrated Planning Act 1997* was introduced, the main objective of the *Local Government Planning and Environment Act 1990* was to undertake the planning of an area to facilitate orderly development and the protection of the environment. Minimalist planning is very pragmatic and concentrates on what is real and obtainable and not on often esoteric and endlessly debated goals. As such it definitely upholds the status quo. This is not necessarily wrong, but it may be a hindrance to any reforms that try to improve it.

• **Instrumental planning:** This type aims first at the identification of socio-economic goals and then at making sure that they are effectively implemented. It has developed in two primary forms:

- The first concentrates mainly on improving and protecting

the physical environment as one of the major warrants for improving the quality of human life. Evans (1997) has even recognized it as "classical town planning," which would normally venture beyond that purely physical agenda to take interest in goals and aspirations of society in general.

- The second form shifts to the social problems and society's goals seeking from planning its active assistance in their achievement. This moves planning away from its traditionally affiliated disciplines of architecture and engineering towards a whole array of social sciences.

While accepting that differences between these two forms may vary, Friedman (1996) is convinced that it is the degree of social orientation that determines what is good planning. England (2001) points to the critique of instrumental planning coming, primarily, from political economy and post-modernism circles.

- The first argued that this form of planning is incapable of achieving its ambitious aims because that is totally dependent on and constrained by the dynamic mechanism of capitalist economies. This could imply that it is "... the urban social movements and not planning institutions which are the sources of change and innovation within the city ..." (KIRK, 1980).

- The second stood on the ground that neither human behavior, nor far too complex links between urban form and societal well-being can ever be effectively "managed" and, in addition, denied the possibility of establishing any clear consensus on goals. The critique has made good points but has not only been exaggerated. What is more important, it has not offered any positive and realistic alternatives to planning. Refuting part of it England (2001) makes two convincing arguments, that "... although instrumental planning cannot alter society's fundamental structural problems it may, nevertheless, have a role to play in implementing more modest reform goals, in the short term or in specific situations. The preservation of a particular habitat ... may be an achievable goal of planning even if the sustainable management of whole species is beyond the grasp ..." and that "... the absence of any vision is an invitation to preserve the status quo, however unsatisfactory that may be. Planning may actively obstruct reform if it fails to move with the times and reflect the dominant goals and aspiration of society ..." In conclusion she argues that instrumental planning if sufficiently well integrated with all essential economic and social aspects of society may become quite effective and that it will naturally develop into holistic, integrated and multi-facet planning.

- **Incremental planning:** This type of planning, which can be seen as a kind of response to the critique of instrumental planning, is supposed to be very pragmatic and "down to earth." The main responsibility of planners is not to discuss how to change the world but to use their qualifications and experience in the proper application of planning law. As a consequence "... the claim to expertise here is based upon a knowledge of the policy process in managerial and political terms and of procedures and case law, linked to a knowledge of the economic processes by which urban development is generated and shaped and a capacity to mediate ..." (EVANS and RYDIN, 1997). Incremental planning is based on a recognition of existing, competing interests and the need for mediation. This locates it not too far away from minimalist planning as both are not interested in any major changes in the existing status quo and believe that planning goals only be set incrementally and within a specific, not general context. Planning as social learning is advocated (FRIEDMAN, 1996) and planners are expected to learn from practical experience what good planning is. As a consequence, this form started to focus on community participation. Recapitulating, England (2001) notes that: "... Participatory in-

crementalism suggests state planning can adequately incorporate the views and goals of urban social movements if the right type of participatory mechanisms are established ... Accordingly, planners are facilitators trained in mediation and procedural processes rather than strategists attempting to operationalise any particular planning goal. Nevertheless, participatory planning does not deny the feasibility of establishing context specific goals ..."

As previously happened in the 1960s and 1970s, with a larger number of emerging new forms of planning, these three types are in many ways interconnected and, if presented as circles, they will be partly overlapping and also locked together within a larger, all-encompassing circle indicating the main and rather widely recognized, social responsibility of planning. Depending on particular problems to be solved, external circumstances and the kind of actors participating, the responsibility could then be discharged in various ways. But is it possible to define such an overall responsibility? Are there universal problems which all types of planning must face, or actors which, almost as a rule, must be involved?

In general, a problem is encountered when a specific aim cannot be achieved. A formula:

"Problem = Aim + difficulties in achieving it"

was proposed a long time ago by Chadwick (1971) and, accordingly, it is not possible to define any problem without first knowing, at least in broad terms, what the aim is that, due to encountered difficulties, cannot be achieved and is, thereby, generating that problem. According to Mazur (1976), at this stage it is necessary to know whether:

- the surrounding world, or the reality (within which the aim is to be pursued) is to be left in peace and all efforts will be directed into its observation and examination to gain all knowledge about it, necessary to handle the problem and achieve the aim; or,
- the reality is to be transformed, and to deal with the problem it is necessary to determine why, how and from what the aim is to be achieved.

As can be seen, the attitude becomes a determining factor here as it is, either reflecting "non-intervention" and then "cognitive problems" are to be addressed, or "intervention" when "decision problems" are to be dealt with. This basic classification of all problems is logically complete and there cannot be any other than cognitive or decision problems. Both are often strongly interrelated and, usually, problems in the first group precede those in the second – or become part of them.

In both cases, however, to define that a problem exists, the aim must be known. This is a common sense that applies also to planning. Thus, problems that planning must deal with would primarily reflect difficulties that prevent the achievement of main planning aims. And what are the latter? Logically, they should be derivative of the aims of human settlements.

A "vintage" definition of the "aims of human settlements" formulated by the United Nations Environment Programme (UNEP) nearly 30 years ago still sounds convincing. It says that human settlements are "... to meet human needs and aspirations by providing the conditions suitable for the biological, social, economic, cultural and intellectual evolution of the human communities involved. This evolution should be in concordance with the environmental and socio-economic potential ..." (UNEP, 1977). And, as a consequence, planning aims should in general:

- secure the "survival" of a given settlement by defining how its environment is to be protected – the very essence of sustainable development; and,
- find such an urban form (pattern, strategy) that a possibly optimum basis be created for the "functioning" of a given settle-

ment and for its biological, social, economic and intellectual "development."

The proposed subdivision of planning aims, if accepted, may assist in overcoming one of the main shortcomings in a conventional way of subdividing planning goals along ways government systems are organized, that is, into education, housing, primary industries, transportation, environment, health and so on. This is expedient in practice but may lead to goals, that derive from the aims, being so compartmentalized that their often obvious mutual interdependence is either lost or, at best, underestimated.

Minimalist, instrumental and incremental types of planning embrace, usually, all these main aims though the focus of attention around them would differ. This is not necessarily bad as it would help to ensure general, political support for overall planning with temporarily varying preferences to some of its main types. It also may be argued that any type of planning would be ready to recognize that the main problems it will have to address would reflect difficulties, existing or anticipated, in achieving survival, functioning and development aims.

What are now the main actors, stakeholders or – as England (2001) wants – "clients" of planning? She puts them into traditional public and private client while also introducing an interesting third type, which is the neighborhood. According to her, "... The public client is of course the community ... to be affected by development ... There are however many communities and many conflicting interpretations of their interests. There is also the wider "public interest" that, with increasing concern for ecological sustainability, may arguably extend to the concerns of international community ... private clients include applicants (individual and corporate) seeking to develop their own or someone else's land. Professionals, including development consultants and lawyers operating associated commercial services may also be regarded as private clients ... [and, finally] ... the neighbourhood, that is, people living in the vicinity of a proposed development who perceive their personal interests will be affected by development if it goes ahead ..."

The latter is indeed a hybrid category for when the concerns of people relate foremost to potential impacts on their property and/or well-being they represent private interests, but when they act to ensure that the community will not suffer they become guardians of public interests.

Field of interest and the nature of planning

The need for planning is not as well understood and recognized as the need for such disciplines as law, medicine, economics and so on. It seems important, therefore, that at least those involved in planning understand clearly its role. Why do we need to plan? What is the role of planning in the community? What might happen without planning? Such questions have been discussed for many decades with mixed results as, clearly, planning can be seen in different ways by different people. Some may even argue that life would be easier without it as planners only obstruct development and it all largely depends on who is the "judge" – a citizen, a developer, a politician – and from what viewpoint planning is assessed.

But what is planning, finally? Science or profession? Is it not, perhaps, both at the same time?

There was heavy "shelling" around this question for over a century when new areas, situated somewhere in between other well established disciplines, both scientific and/or professional, have developed and often proved to be particularly promising. A long time ago Wiener (1948), a "father of cybernetics," argued that some neglected areas, left in no man's land, were the most prone to evolving new ideas. It may be argued that planning falls into this category and has developed as a discipline in its own right which, with its rather unique co-

ordinating and integrating abilities, can bring new approaches and span quite a few traditional disciplines.

But is it generally right to separate science from professions? This old dilemma was skilfully tackled, decades ago, by Batty (1979) in his excellent analysis of the planning process which, he argued, encompassed two major and interrelated processes:

- one, related to the gathering of knowledge about a subject of planning; and,
- another, which was to use this knowledge for generating actions.

Traditionally the first may be considered as calling for "scientific research" with cognitive orientation, while the second as the responsibility of "professional approach" with decision-making orientation.

One of the main conclusions drawn by Batty (1979) was that "... the distinction between science and design is much less clear than it might appear ..." and, more importantly, that "... it is probably impossible to do science without design or design without science ..." Consequently it means that scientific and professional aspects of planning are virtually inseparable. Thus, it should be recognized that any planning exercise does not only include the definition of problems, which calls for cognitive research, but almost invariably must seek their optimum solution, which involves postulation, optimization and realization, as typical decision-making problems.

This reasoning can be applied to many professional disciplines and it is worth pointing out that following the same line of thinking, Mazur (1976) made his principal philosophical, all-embracing statement that "... science as an activity concerned with problem solving is one whole ..." According to him it was a tragic misunderstanding that for thousands of years only cognitive problems were considered as being part of science while decision problems were left in the hands of politicians and/or so-called professionals, often including people who did not have the slightest idea about a rational approach to solving these problems. One may add that even today a great number of decision makers do not know that any decision, as the solution of a decision problem, should be founded on a rational, scientifically sound base and that its correctness must be proven. The relevance of this statement not only to the realm of planning but also with regard to all disciplines recognized commonly as "professional" and, by false inference, not scientific, seems to be quite conspicuous.

Planning and sustainable development

The concept of sustainable development and its worldwide impact has impinged upon various disciplines, both in academic and professional circles.

Scientific and professional responsibilities

How has this concept of sustainable development influenced the evolution of planning theory and its main responsibility, that is, the preparation of planning schemes? Has the theory and practice satisfactorily encompassed the concept of sustainability and has its achievement been sufficiently recognized as an inherent and important part of a planner's responsibility?

Although in the 1990s marked progress can be noted in this field, a predominant, day-to-day approach to environmental problems by many planners is still much more "ex post" rather than "ex ante," i.e. curing the symptoms rather than preventing the causes. The emphasis has been on where, what and how much to develop, rather than what ecological or environmental consequences such development will entail. In addition, plan-

ners also have been failing to seriously consider the significance of keeping development within the carrying capacity of natural ecosystems and to ensure the continuing maintenance of natural resources and life-support ecosystems that provide essential environmental services. Yet, it is planning that can and should play a key role in maintaining water flow patterns, protecting soil, preventing bio-degradation of pollutants, recycling wastes, regulating climate, supporting fisheries and other important living resources. In spite of worldwide efforts promoting ecologically sustainable development, the interrelationships between the needs of humans and the needs of nature have still often been ignored within the main strands of development decision making. It seems that the "green" way of thinking may have yet to penetrate planning at large and its "statutory" facet, in particular. The absence of an easily identifiable "common," basic approach for planning towards sustainable development is also worrying, particularly at the everyday planning level where the majority of development decisions are made. Therefore, an ongoing need "... to adopt and implement an ecological approach to human settlement planning to ensure explicit embodiment of environmental concerns in the planning process and thus promote sustainability ..." (IUCN, UNEP and WWF, 1991) is as necessary now as when it was defined.

For a long time it has been widely recognized that the main role of planning is *to guide, to control and to coordinate development in space and time*. Most of the planning types developed over years would probably agree with this. However, the concept of sustainable development has surged into the world scene with considerable impact and several questions have emerged:

- How critical and urgent is it for planners to join the mainstream of the unfolding battle for the survival of our planet?
- How can planning most efficiently contribute towards implementation of sustainable development?
- Should environmental concerns become an integral and mandatory component of the planning process?
- Should not, therefore, the role of planning be re-defined?

Answering the latter it can be argued that development is commonly governed by three groups of factors:

- **socio-economic goals**, reflecting physical and intellectual needs of a given community;
- **geographic environment**, creating constraints and opportunities; and,
- **socio-economic determinants**, including the state of the economy, technology, social organization, cultural tradition, political system, etc.

In turn, a generic definition of any "planning" may see it as the process of defining goals and of indicating by which ways and means these goals can be attained. The goals should be defined by the community or, at least, with its strong involvement, as socio-economic determinants are, generally, beyond the direct control of planning. This means that, within the overall context discussed so far, the role of planning could be re-defined and seen as to indicate how, within a given geographical environment and socio-economic determinants, development can most efficiently be guided, controlled and coordinated to achieve the pre-determined goals and, at the same time, ecological and economic sustainability.

Recognizing that statement would mean accepting sustainable development as an integral part of gazetted planning's goals. This has been already happening. For instance, in Australia the new *Integrated Planning Act*, passed in Queensland on 1 December 1997, has put in its first paragraph that "... The purpose of this Act is to seek to achieve ecological sustainability ..." The "planning world" in Queensland, and notably planning legislation as well, have never been the same

again. This is certainly not the only place in the world where planners have been moving in this direction though, regrettably, there are more places where they have not.

In this context, planners involved in generating and/or advancing various development proposals – policies, strategies or projects – and in determining their environmental and economic consequences have a responsibility to integrate the principles of sustainability, developed at global, national and local levels, into decision-making processes to ensure that the outcomes of development are sustainable and that biodiversity is conserved. To discharge this responsibility they should, primarily, concentrate upon:

- **Management of development**, with particular attention to the rational use of land and all resources, to be carried out primarily through properly establishing the preferred:
 - *location, scale, kind and timing* of development, to be contained within the ecologically and economically sound "solution space" defined by physical constraints of final character; and taking into account all remaining constraints and opportunities imposed by the geographical environment; and,
 - *form (patterns)* of development, designed to facilitate attainment of ecological and economic sustainability for the identified range of reliable development options.
- **Conservation of nature**, with particular attention to biodiversity, to be achieved primarily by
 - *preservation and protection* of the natural environment and its resources; and,
 - *rehabilitation and restoration* of elements destroyed in the past.

Thus, planning must be accountable for providing a reliable base for day-to-day development decision making related to various aspects of the functioning and development of settlements and the conservation of nature and natural resources.

The real "value" of planning would depend, however, on *efficiency* of implementation, that is on how successfully it intervenes in an ongoing process of development and decision making. In this regard the prime responsibility of planners in the field seems to be at least:

- to examine all possible development proposals (alternatives, strategies) leading to the attainment of socio-economic goals;
- to indicate environmental and economic consequences of pursuing these proposals;
- to ensure that each proposal submitted for consideration is "implementable"; and,
- to recognize that decision makers (politicians and developers), a range of various stakeholders and the community at large, are fully informed of the scope, magnitude and character of these consequences.

A "model" planning process

Safeguarding the efficiency of planning, which determines its real value, depends primarily on three groups of factors:

- **interrelations** between planners and decision makers, stakeholders and the community;
- management of development processes and the use of various **incentives** or **sanctions** to influence the behavior of the main players in these processes; and
- **planning methodology** reflected, to a great extent, by the planning process.

The latter group is primarily planning's domain, and should be given particular attention, while promoting interdisciplinary discussion and/or co-operation in planning for sustainable development, to make it easier for specialists from other disciplines

to understand the main principles and the way of thinking behind planners' approaches to the preparation of local and strategic plans. They may then raise some important questions on the matter and take an active part in answering them:

- Is it, however, possible to characterize those approaches in general?
- Are there any universal and basic components of a planning process?
- Is there any common interdependence between them?
- Is there any, normally recognized, sequence in which they should be dealt with?
- Are there, finally, any external, though affiliated, components that, as a rule, must be taken into account?

A simplified, "model" planning process presented and briefly examined below is expected to help answer such questions. Certainly, it offers only a basic structure of the planning process, as a mental framework for a rational approach to problem solving in the course of a planning exercise. Thus, it can be seen as a *flexible guide* for the preparation of any major type of local or strategic plans but also as a *platform* for discussion on how it can be improved. If applied in practice, it certainly would have to be expanded and adapted to concrete circumstances (specific problems, legal setting, local administration and so on).

To be consistent with the aim of this paper, the "model" process should, in particular:

- expose where in the process planning can make its main contribution towards attainment of sustainable development; and,
- indicate the importance, mutual interdependence and place in the process of its major internal components and external determinants.

The process (fig. 1) is based on Mazur's *postulation, optimization and realization*, as three main stages required for solving

decision problems (KOZLOWSKI, 1988) and subdivides it into corresponding main phases. Within their components specific matters are to be addressed and questions answered to attain expected outcomes. This concept is further elaborated in the matrix below (table 1).

● An important part of the process is **Evaluation**, which provides the main basis for the Choice. Its main yardsticks should be aims (goals, objectives) and their implementability. To properly monitor the progress of work, the evaluation should be applied throughout the process and not only at its final stage. This points, in turn, to the importance of **feedback**, intertwined with evaluation, as an equally essential feature of the process. Finally, reminding that effective implementation determines the real value of planning, *monitoring* of its performance should be, as a rule, an integral part of the planning process, providing a major input to its subsequent never-ending cycles.

● The main core of the planning process must be followed by **Implementation**, during which the initial problems are expected to be solved (but new ones would surely appear). The real value of planning depends on its *effective* implementation and, as a consequence, it must be seen as its integral part. Its monitoring, in fact, should become, as a rule, a major input to a subsequent cycle of the never-ending process of planning.

The other key, though external, components of any planning process are:

● **Forecasting**, essential for identifying future problems and, thereby, a fundamental prerequisite of proactive planning (reliability of forecasting would usually decrease proportionally to the time span covered). Forecasting can be subdivided into:

- **demographic**, which deals with the size and structure of the future population as a function of expected natural growth and migration;
- **societal**, which deals with the most likely behavioral models of the future community;

Table 1
The three main stages required for solving decision problems

| Phase | Matters to be addressed | Questions to be answered | Expected outcomes |
|--------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| PHASE 1 PROBLEM IDENTIFICATION (Postulation) | Diagnosis of the existing situation Setting the task | Is planning intervention needed? Why do we need to plan? | Identification of planning problems. Determination of aims and objectives can be attained through planning. |
| PHASE 2 PROBLEM SOLVING (Optimization) | Defining development program Identifying possibilities Formulating strategies Determining the means Making a choice | What is to be allocated? Where is it best (optimal) to allocate? How can the aims be achieved? By what means can the aims be achieved? Which of the strategies offers the most? | Definition of ecological, economic and social needs (aspirations) Identification of development constraints and opportunities Generation potential ways, or strategies, for allocating the "program" within the "possibilities" Indication of the necessary resources and confirmation of their availability Evaluation of the positive and negative implementation consequences of each strategy |
| PHASE 3 IMPLEMENTATION AND MONITORING (Realization) | Assessing progress in transformation of the existing situation Establishing implications for further planning | Is it necessary to redress and strengthen the ongoing process of implementation? Was the intervention successful and should it continue? | Constant review of the state of achievement of the planning aims and objectives Examination of the current state of the problems to redefine them or to identify new ones |

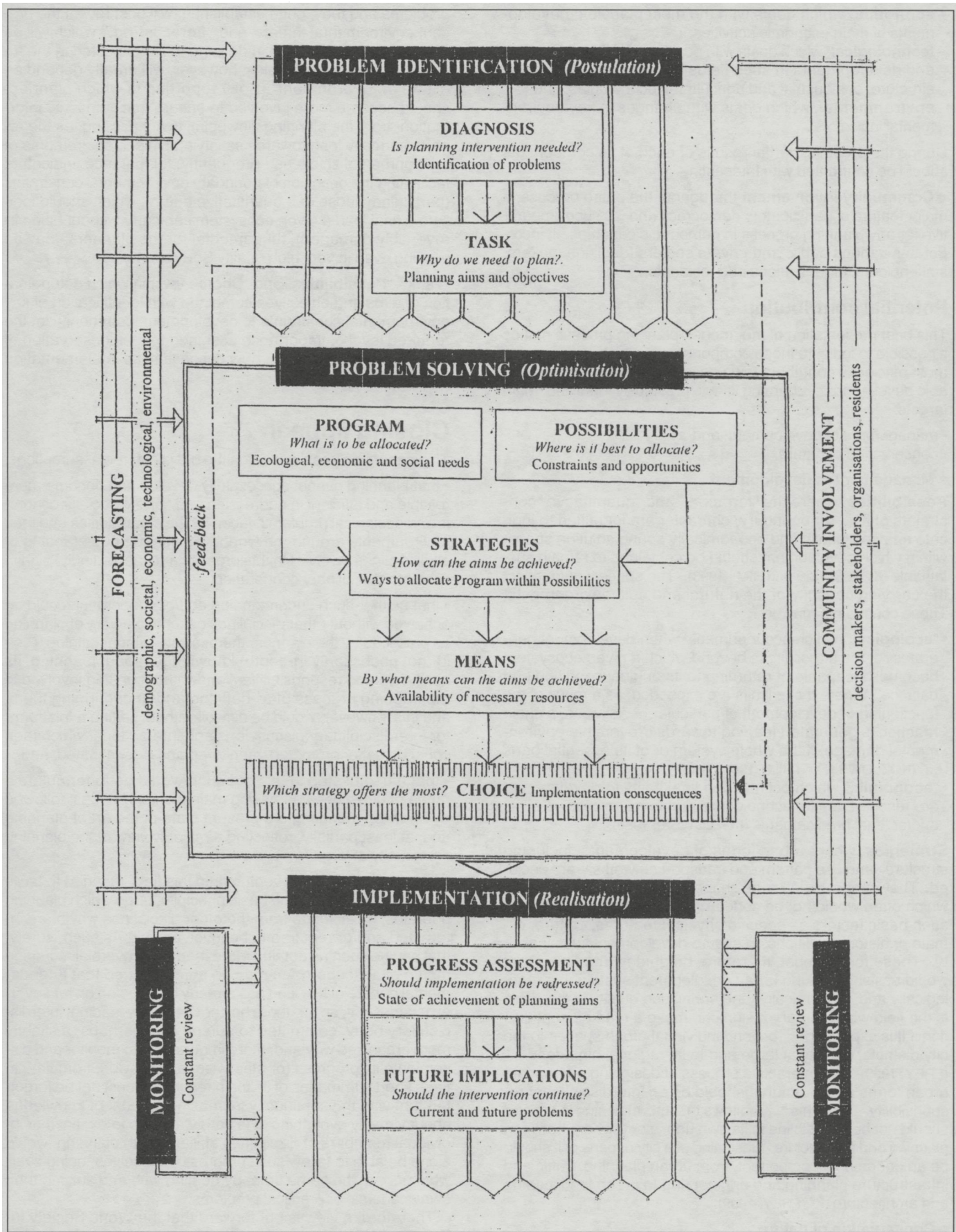


Fig. 1: Flow diagram of a simplified "model" planning process.

- **economic**, which deals with the most plausible developments of main economic activities;
- **technological**, which deals with possible significant changes and developments in such fields as energy supply, infrastructure, or industrial and agricultural technologies; and,
- **environmental**, which deals with changes in key environmental indicators.

During the process, partial results of each of its components should be confronted with forecasting.

● **Community Involvement** throughout the entire process, a major feature of participatory democracy and, as such, imperative for any planning process in democratic countries. It incorporates various public and private sectors (decision makers, stakeholders, organizations and residents).

Potential contribution

This brief presentation of the “model” planning process makes it possible to indicate those components in which planning can most efficiently contribute towards implementation of sustainable development, regarding its two previously identified, main targets:

- management of development, and
- conservation of nature.

● Management of development

Possibilities, where the “territorial” and “quantitative” constraints of final (or boundary) character are identified to indicate an ecologically and economically sound solution space, within which development should be contained to remain sustainable (KOZLOWSKI and HILL, 1993). The space would reflect the carrying capacity of the natural and built environments. These constraints may be:

- “**ecological**,” which occur primarily when development generates “... the stress limits beyond which a given ecosystem becomes incapable of returning to its original condition and balance. Where these limits are exceeded, as a result of the functioning or development of particular ... activities, a chain reaction is generated leading towards irreversible environmental damage of the whole system or of its essential parts ...” (KOZLOWSKI and HILL, 1993); and,
- “**economic**,” which occur when final limits to development are reached due to technological problems, excessive costs and/or legal predicaments (KOZLOWSKI, 1986).

Strategies, where urban forms of development – including structure, land use pattern and transport networks – are decided. They cannot be left to be shaped only by economic forces, which often would not be concerned with taking into account such basic factors as specific physical features, culture, climate or historic traditions, to ensure development sustainability. These forces must, therefore, be guided into forms that would assist in making urban development sustainable (ecologically and economically) and enhancing quality of life. This is the field where urban design can make a marked contribution if it is expanded “... beyond individual urban spaces to the city districts, the city at large and to its regional hinterland ...” (FREY, 1999). The interactive process of designing appropriate urban forms and structures should be an interdisciplinary responsibility. From this “... it follows that urban design is not and should not be a discipline in its own right, somewhere between planning and architecture. Designing of a city or parts of it should be an operational component, from urban planning, traffic and infrastructure planning and engineering to urban landscaping and architecture ...” (FREY, 1999).

● Conservation of nature

“**Diagnosis**,” which concentrates on identification of planning

problems and they, once established, will best reveal the present environmental threats, and “**Forecasting**,” which will be of substantial assistance in defining those expected in the future. Success in both fields, however, will greatly depend on “State of Environment” (SoE) reporting in which planners should become more involved to ensure that some key information, from the planning viewpoint, is not missing, as the reports normally lean towards satisfying typical requirements of environmental sciences. Frequently, for instance, indicators facilitating the definition of boundary environmental constraints (particularly those of a quantitative nature, which should indicate a final load a given ecosystem can carry without being irreversibly damaged), fundamental for the planners, may be missing even in very high quality SoE reports.

“**Task**,” “**Possibilities**” and “**Choice**,” within which determination of aims and objectives combined with identification of key environmental constraints to development, commonly set the required level of importance assigned to the conservation of nature to ensure, in turn, how successful its implementation would be in practice.

Closing appeal

This paper has been written on the basis of three assumptions:

- that planning cannot successfully develop and become more reliable and efficient in addressing and solving social, economic and ecological problems, faced by the communities and their environments around the world, without an understanding of all disciplines involved in this process and, accordingly, significant interdisciplinary cooperation;
- that neither such understanding and/or cooperation could be achieved without other disciplines becoming aware of planning as practiced by the planners themselves, without gaining a solid (not necessarily in-depth) knowledge, about planning, its aims, role and responsibilities, and without getting involved in the ongoing process of re-defining and/or confirming them, and this, however, would be difficult without setting a “platform” for interdisciplinary discussions and interactions, which then could be better promoted, monitored and disseminated; and,
- that a useful step in this direction would be to formulate a range of questions addressing main planning issues, followed by answers reflecting the present state of the art of planning and, at least partially, reflecting a majority view of the planning community at large.

The author’s modest venture into this field intended to facilitate understanding of the basic principles upon which planning operates, by all those from the other disciplines which are interested and/or required to be involved in it. As such, surely, that can be seen as nothing more than the proverbial “scraping the tip of an iceberg.” It may be rightly argued that a fundamental debate of this kind has already been going on for several decades but, so far, there has not been any leading, interdisciplinary body, committed to pursue it in, perhaps, a slightly more organized way and, more importantly, to monitor and disseminate its progress (or otherwise) and provide, from time to time, short summaries of its main results. It must not be forgotten that with the continually increasing amount of knowledge about virtually everything, it is hardly realistic to expect that individual members of disciplines affiliated with planning, would alone be able to follow such progress themselves, being overwhelmed, at the same time, by dealing with and solving their own academic or practical problems.

Therefore, a view is put forward that the World Society for Ekistics (WSE), as an almost “tailor-made” body for such a task, take a lead and move into it as soon as possible. The au-

thor appeals to the WSE to seriously consider this potential and most promising prospect.

References

- BATTY, M. (1979), "On planning process," in B. Goodall and A. Kirby (eds.), *Resources and Planning* (Oxford, Pergamon), pp. 17-45.
- BLAIR, T. (1971), "Advocacy planning," *Official Architecture and Planning*, no. 2, pp. 131-134.
- CATANESE, A.J. and A.W. STEISS (1971), *Systemic Planning: Theory and Application* (Lexington, MA, Heath).
- CHADWICK, G. (1971), *A Systems View of Planning* (Oxford, Pergamon).
- DALY, H.E. and J. COBB, Jr. (1989), *For the Common Good* (Boston, Beacon Press).
- DAVIDOFF, P. and T. REINER (1962), "A choice theory of planning," *Journal of the American Institute of Planners*, vol. 28, no. 5, pp. 103-115.
- DOXIADIS, C.A. (1968), *Ekistics, An Introduction to the Science of Human Settlements* (London, Hutchinson).
- ENGLAND, P. (2001), *Integrated Planning in Queensland* (Sydney, Federation Press).
- EVANS, B. (1997), "From town planning to environmental planning," in A. Blowers and B. Evans, *Town Planning into the 21st Century* (London, Routledge), pp. 1-14.
- and Y. RYDIN (1997), "Planning, professionalism and sustainability," in Blowers and Evans, *op. cit.*, pp. 55-69.
- FACTOR 10 CLUB (1997), *Carnoules Statement to Government and Business Leaders*. (Available from the Factor 10 Institute, La Rabassière, F-83660 Carnoules).
- FALUDI, A. (1987), *A Decision-Centred View of Environmental Planning* (London, Pergamon).
- FOLEY, D. (1964), "An approach to metropolitan spatial structure," in M. Webber (ed.), *Explorations into Urban Structure* (Philadelphia, University of Pennsylvania Press), pp. 56-78.
- FREY, H. (1999), *Designing the City: Towards a More Sustainable Urban Form* (London, Spon).
- FRIEDMAN, J. (1971), "The future of urban comprehensive planning: A critique," *Public Administration Review*, vol. 27, no. 5/6, pp. 311-318.
- (1996), "Two centuries of planning theory: An overview," in S. Mandelbaum and R. Burchell, *Explorations in Planning Theory* (New Brunswick, NJ, Rutgers University), pp. 10-29.
- GUTTENBERG, A. (1964), "The tactical plan," in Webber, *op. cit.*, pp. 197-219.
- HAWKEN, P., A. LOVINS and L. LOVINS (1999), *Natural Capitalism, The Next Industrial Revolution* (London, Earthscan).
- IUCN, UNEP and WWF (1980), *World Conservation Strategy* (Gland).
- , UNEP and WWF (1991), *Caring for the Earth – A Strategy for Sustainable Living* (Gland).
- KIRK, G. (1980), *Urban Planning in a Capitalist Society* (London, Croom Helm).
- KOZLOWSKI, J. (1986), *Threshold Approach in Urban, Regional and Environmental Planning* (St. Lucia, London, New York, University of Queensland Press).
- (1988), "Planning research and education: Looming perspectives," *Ekistics*, vol. 55, nos. 328/329/330 (Jan.-June), pp. 31-38.
- and G. HILL (1993), *Towards Planning for Sustainable Development* (Aldershot, Brookfield, MA, Avebury).
- McLOUGHLIN, J. (1966), "The PAG Report: Background and prospects," *Journal of the Town Planning Institute*, vol. 52, no. 8, pp. 257-261.
- (1969), *Urban and Regional Planning: A Systems Approach* (London, Faber).
- MAZUR, M. (1986), *Cybernetyka i Charakter* (Cybernetics and Character,) (Warsaw, PIW).
- MUNSHINGHE, M. (1994), "Economic and policy issues in natural habitats and protected areas," in M. Munashinghe and J. McNeely, *Protected Areas Economics and Policy* (Washington DC, The World Bank and World Conservation Union (IUCN)), pp. 15-49.
- PEARCE, D., A. MARKANDY and E.B. BARBIER (1989), *Blueprint for a Green Economy* (London, Earthscan).
- PICKERING, T. and L.A. OWEN (1994), *An Introduction to Global Environmental Issues* (London, New York, Routledge).
- PLANNING ADVISORY GROUP (1965), *The Future of Development Plans* (London, HMSO).
- STATE OF QUEENSLAND (1997), *Integrated Planning Act 1997* (Act no. 69) (Brisbane, Government Printer).
- UNEP (1977), *Human Settlements and Habitat (Report of the Executive Director)* (Nairobi, United Nations Environment Programme), UNEP Report no. 1.
- WORLD COMMISSION ON ENVIRONMENT AND DEVELOPMENT (WCED) (1987), *Our Common Future* (Oxford, Oxford University Press).