Pergamon

*Socio-Econ. Plann. Sci.* Vol. 30, No. 2, pp. 81–102, 1996

S0038-0121(96)00003-1
0038-0121/96 $15.00 + 0.00

# Towards a New Discipline of Planning†

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**Abstract**—In many fields of activity, from various disciplinary domains and historical–cultural roots, a new area of study is emerging, which concerns planning more and more specifically. By 'specifically' we intend to show that the new discipline consists less of the grafting together of several familiar disciplines, in as much as it is taking on a new 'specific' identity which is difficult to trace back to its component parts. The present paper focuses on this process, and examines the new identity's component parts.


## THE FIELDS OF ACTIVITY

We will begin by casting a quick glance at the fields of activity, the disciplinary domains and the historical–cultural roots specifically relevant to planning.

These fields of activity are those in which planning has been applied, with varying fortune. They are many, but in attempting to summarize (not without the risk of over-simplification and unjust omissions), we have gathered them into the following classification (ordered not according to importance, but rather to their historical occurrence): (a) physical planning, i.e. urban and territorial; (b) (macro-)economic planning; (c) social planning; (d) development planning; and (e) operational planning. The nature and confines of these five fields are recalled below—hurriedly and, therefore, perhaps disrespectfully.

### *Physical planning*

Physical planning was the first—we think—to be born as a field of activity: it arose from the need to plan the physical development of cities.

Although many place its origins in the utopian designs of 'cities of the future' (designs that have always existed and flourished, particularly around the turn of the 18th century), it appears historically as an extension of the 'art' of building construction. It is no coincidence that the first texts on urban planning went under the name of 'the art of building the city'‡. It is difficult to imagine other reasons for which urban planning—as a discipline of study and professional training—developed in the early decades of this century as an off-shoot of architecture.

Despite planning, right from the beginning of the century, being heavily influenced by organic theories—like those of Patrick Geddes [37] who was a biologist by training and culture—in actual fact 'master plans' or 'plans directeurs' are still essentially, for better or worse, plans for the physical construction of cities. The rest is academic.

In time, physical planning became extended to include non-urban areas, with the intention of viewing the development of town and countryside as a whole. In more recent times, in fact very recently, this planning area has spread to include the 'environment' in general (meaning the physical environment, however), giving rise to what is often called 'environmental planning'. One cannot forget that, in recent times, a special area of reflection amongst planners called 'planning theory' has developed from planning culture and, in particular, from that of the Anglo-Saxon tradition. This represents one of the 'critical points' in the conceptual renewal of planning itself. It is remarkable, but also symptomatic, that apart from a few rare cases, planning theory development

†A previous version of this paper was presented to the *First World Conference on Planning Science*, Palermo, Italy, 8–12 September 1992.

‡If the so-called 'urbanistic' popes of the 15th and 16th centuries had theorized their work, it would have represented something of this kind.

has not gone beyond the ambit of physical planning, even though it could well have been of interest to other fields of planning (discussed below). The best known exponent of this strand is Faludi [28], the author of an initial *summa* of Planning Theory, with which the strand actually began. In the last two decades, the debate has been greatly extended. An intelligent, instructive summary can be found in Alexander [3].

*Macro-economic planning*

The other activity field in which planning has had an important and 'classical' role is that of macro-economic planning. Its first application found maturity during the First World War, with the need for rational and strategical management of resources in a time of great scarcity.†

It was within the context of historic Soviet-style planning that economic planning had its first, best known and debated manifestations. As it was inserted in an institutional context based on the principles of collective ownership of the means of production (even the land), Soviet economic planning was soon identified with the political regime under which it was applied. This left little room for sophisticated conceptual distinctions in the West. This has represented a formidable weapon for those opposed to the introduction of economic planning in the West, who, for the past 70 years, have benefited from the political horror this regime gave rise to in the West to discredit the instruments as well as the politics. Even today, many are disposed to argue that the collapse of the regime was due to economic planning rather than the political regime that applied it, thus ignoring the undeniable and substantial progress made in the U.S.S.R. at the technological, as well as economic levels, with respect to its starting point. This happened in part to complex management of the economy and, in spite of errors made in the final choices of allocation of resources, which the regime imposed on its own planning process.

The idea of a more rational management of capitalist or market economies—underlining the structural differences between the economic 'systems' referred to—has encouraged the development in the post-war period of more systematic political economic interventions on the part of various national governments, by means of the progressive and experimental introduction of systems of central planning.

France and Japan were the first to officially implement economic planning processes, the former with the '*Commissariat au Plan*', the latter with the 'Agency for Economic Planning'. Claiming to be distinct from the Soviet experience, their activity was named 'indicative' planning. Many countries followed suit‡: The Netherlands, Norway, and in the 1960s, Belgium, Great Britain, Italy and Denmark. All these began to experiment with 'indicative' planning as opposed to that practised in collective economy regimes (which was called 'imperative' planning). On the other hand, it was also necessary to overcome the opposition of a well-rooted *laissez faire* culture.

Even the U.S. followed suit (where indicative planning experiments resulted in the National Planning Board of 1934) in the late post-war period. This, despite the unfavorable climate resulting from the growing threat of Stalinist imperialism, and from the need not to risk compromise with that which revealed itself as the enemy of 'free enterprise'. There was, then, the expansion of indicative planning experiences at the level of economically depressed regions, at the state level, and, finally, at the Federal level, with the reiterated appeal for the definition of 'national objectives' of public expenditure, particularly Federal (with the application of PPBS ('Planning, Programming, Budgeting System')) methods (more about these later).

Macro-economic planning has naturally learned from the theorems of macro-economics (the theory of general equilibrium and Keynesian theory), in that it applies itself to a system of quantifiable variables of those socio-economic phenomena that need to be managed (income and its distribution, employment, productivity, foreign trade accounts, public debt, consumption, investments, etc.). Further to this, it utilizes criteria and techniques used in operational research in order to introduce optimal choices (i.e. constrained maxima) in economic policy. It was Jan

†From positions of responsibility assumed during the war, Herbert Hoover (in the U.S.) and Walter Rathenau (in Germany) in fact introduced planning methods for the management of war material and national resources in general. These may be considered the forerunners of economic planning.

‡This refers particularly to the French experience, since that of Japan, though perhaps historically more effective, remained alien to Europeans. This may be due to linguistic and cultural barriers as well as incomparable socio-economic structures.

Tinbergen, and his school [78–81], that codified planning procedures, or quantitative theory, in economic policy. Such experiences have, however, matured in various centres of thought and application linked to central planning offices, including that of the (former) U.S.S.R. For instance, until the 1960s, the Kantorovich school pressed for the introduction of 'optimal planning' in Gosplan methods, but with little political success (see the English translation of a 1959 work [44]). On macro-economic planning as a whole, we could not do better than recommend one last work, which is, unfortunately, not very well known—that of Leif Johansen [42] in two volumes (the third was halted by the death of the author). Obviously, at the same time, one cannot but recommend the notes and fundamental contribution of Jan Tinbergen [78–81], noted earlier, and, also, Ragnar Frisch's last essays (published posthumously in 1976 [36]).

*Social planning*

Social planning represents a field of activity consisting of components that are not always assimilable into a unitary whole.

This field of planning was born and developed above all at the local and community levels with small projects, and has been pervaded throughout its development by an anti-centralist and localist rhetoric. It covers a vast field of action (education, health, social integration, living- and working-conditions, women, children, the elderly, crime, etc.) and, thus, by its very nature, leads to particular openness with regard to 'integration' of approaches. It is pervaded by religious faith in the efficacy of 'planning from the bottom'. It extols voluntary action and participation.

It has found operational stimuli in all situations and has been present in all historical experiences. It is the field of planning that is least contested and least obstructed; this is partly due to its fragmentation and relative 'unsystematicness' that keep it far from the research and respect of 'rational paradigms. These characteristics have rendered it somewhat spurious to strictly defined fields of planning. The most extensive and forceful manifestation of social planning has taken place in those countries where the 'welfare state' has been most effective and where there has been more public spending favoring the creation of an army of social workers.

The merits of social planning are numerous, and we will thus provide but an incomplete summary of them. In the first place, it has the merit of arrogating for itself the unilaterality of the 'economic' approach (with its strongly limited 'rationality'). Secondly, it has always criticized the significance of (macro)economic aggregation and the capacity of the latter's variables to determine objective functions, or 'collective preferences' in economic planning processes. Thirdly, it has stressed the participative aspects, and thus also those related to negotiation in all planning processes. Fourthly, the merit of having extended the spirit—through all its micro-projects—of 'evaluation' of results, and this has contributed greatly to the 'rationalization' of all planning projects and helped give 'evaluation' its proper place in planning (even outside the field of social planning). In the fifth place, it has opened the doors to a wider concept of 'development planning' through its sensitivity to problems that are not strictly economic, but, rather, socio-cultural. And, finally (this sums up the above) social planning has constituted the most important base for the launch of an integrated or unified approach to planning from technical as well as political points of view†.

*Development planning*

This planning field of activity can be considered special in that the terrain in which the planning activities operate influences the form the (planning) activities take. Such a terrain consists largely of the developing countries. This does not change the fact that the term has often been applied to development within 'developed' countries. But, in such cases, the activity field loses its identity and becomes more similar to macro-economic planning.

The development planning field is divided into two distinct areas: development planning as it regards each developing area (whether country or region), and that regarding the planning relationship between developed and developing countries.

In both cases, the field and sub-fields have been, and remain, the object of direct interest on the

†This approach was never really applied, though it was strongly desired and projected by the UN: Resolutions 1139/1966; 1320/1968; 1409/1969; and 1491/1970 of ECOSOC, the Economic and Social Council of the UN [83]; and—its last important manifestation—Resolution 2681/1970 of the General Assembly [85]. It was an approach likewise promoted by official UN research institutions [87, 88].

part of the UN system; and it is within this ambit that they have developed. However, in this field as well, there has been a great deal of frustration.

As regards individual countries, the management of development that should have been the object of 'planning' has realized circumstances resulting from the political instability often found in such countries, from their political and economic dependence, from their inability to integrate at a multi-national level (perhaps as a result of their political dependence), and from a cultural precariousness that has put them in a position of not being able to rely consistently on an effective administrative and operational structure that is adaptable to new methods. From a certain point of view, the absence of consolidated interests and of a pluralism of self-regulating economic activities could have placed developing countries in a more favorable position as regards the introduction of rational methods that would have conflicted less than in developed countries, with their constituted interests, privileges and historically acquired customs. However, the proportional absence of an evolved and aware ruling class has more than compensated (negatively) for the absence of institutional obstacles put in the way of planning.

At the level of the overall relationship between North and South, development planning—despite laudable efforts on the part of international agencies which have always been prompt to suggest supra-national methods of management and government—has been frustrated by, for example, (1) the persistent resistance by the great powers to the strengthening of supra-national powers, and the adoption of truly multilateral methods of cooperation for development; (2) the great Western powers' interest in maintaining, for the purpose of commercial control and political expediency, a relationship of bilateral dependency; (3) the tendency of developing countries to compete amongst themselves and seek bilateral privileges wherever possible; (4) internal conflict between developing countries' autochthonous internal interests and powers (which is sometimes exploited by developed countries and sometimes suffered passively for reasons of political opportunism); and, above all, (5) the adaptation to a freer, more modern and internationalist expression of national policy in developed Western counties, rather than the persistent fear of the cold war and that of an ever-incumbent totalitarian regime on a world scale.

Despite all this, the UN has tried to introduce a world development observatory and to elaborate some unitary development planning policies. To these attempts must be ascribed the activities of the Committee for Development Planning, headed by Jan Tinbergen [81, 82], and the efforts to model world economic relations (directed by Wassily Leontief [48, 50]). Unfortunately, these have not had the necessary political support and follow-up. But, one might also ask oneself whether there has been adequate support from the scientific community, and from all those informal non-governmental groupings that, together with the scientific community, play an important role in the promotion of concepts and initiatives.

Development planning, however, is a field in which various disciplines have met and collided since, within it, there have been realized (more than in other fields) integrated forms of economic, social and even physical planning. This has also arisen from the very 'simple' nature of the economic structures involved (those of developing countries) which have been seen as related directly to individual 'intervention projects'. This has opened the way to a further specific 'field' of planning, which we will call 'operational' (of which more is said later), in which 'economic' discipline meets the engineering and managerial disciplines, and, in which macro-economic planning comes widely into contact with micro-economic approaches (e.g. cost–benefit analysis).

*Operational planning*

The field of operational planning would appear, therefore, to represent fertile ground for disciplinary integration. Although this field has had an important role in development planning (in developing countries), it has been equally applied and developed in complex and advanced economies. Here, planning science has almost rediscovered its origins: as management science. By the origins of planning we mean the first—to a greater or lesser extent, utopian—applications of engineering to social projects and to any form of public administration. Let us not forget that the first educational sanctuary of the social planners was the French 'Ecole Politechnique' (later copied in other states), from which a number of reformers emerged, including Saint-Simon, Comte, Considerant and others. Nor should we forget that the first attempts at large scale economic planning were considered questions of management of scarce resources (primary resources and

foodstuffs) during the First World War (as mentioned above), and that these were carried out by polytechnic engineers more or less introduced to management of industrial firms (e.g. Walter Rathenau in Germany, graduate of the Polytechnic of Karlsruhe, and Herbert C. Hoover in the U.S.A., engineering graduate of stanford). In the U.S.S.R., Lenin saw planning as a grand enterprise of engineering management at the scale of the entire economy, influenced by his fascination for capitalist industrial management (much as Marx was fascinated by entrepreneurship in his time).

Operational planning is also composed of two areas (which are somewhat distinct in practice, but difficult to distinguish in theory): (a) the planning of single 'projects', which we can call '*micro-operational*', and (b) the planning of entire operational sectors of administration and public expenditure, which we can call '*macro-operational*'.

Both areas of operational planning draw from the theoretical and practical experiences of 'management', and the sciences that have been formed around it: evaluation science, decision science and planning science itself. By their very nature, these do not take into consideration the public or private nature of the plans to which they are applied. Both operational planning areas draw onthe progress made in applied mathematics (matrix-analysis, factor-analysis, multi-criteria analysis, game theory, etc.), and in operational research (linear-, non-linear-, quadratic-, dynamic-programming etc.) in the introduction of typically trans-disciplinary tools of analysis and evaluation (of which, more below).

Micro-operational planning, even if applied to public projects, relates to the variables (and theorems) of micro-economics, and its accounting system, which—in the institutional development of modern market economies—is the economy of the individual, usually private, concern. It is founded on the concept of the 'project' (whether public or private), and on its evaluation.

In the form concerned with management of enterprise—especially in the case of large firms—operational planning becomes 'corporate planning'. This constitutes another great field of planning, which has not been discussed thus far since it lies outside the horizons of our concerns: planning in the public and community interest.

On the other hand, macro-operational planning, which is essentially public in character, applies to the variables and theorems of macro-economics, and its accounting system. Macro-economic planning (as noted above) has employed products of operational planning to a large extent, applying them at the macro-economic level (arguably, the work of Tinbergen and his school can be interpreted in this way). It seems that, for the second time in its history, economics is a tributary of corporate theory. Just as the old political economics was born as a generalization of micro-economic theory of the firm, the 'new' economic policy, which is essentially macro-economic planning, can be seen as a generalization of operational planning of large-scale industry. The description of the nation in terms of one 'great firm', so critical to Leninists and socialists in general, has become an even larger part of journalists' language.

Operational planning—both in its micro version (corporate and project) and its macro version (programmes and public expenditure), has two fundamental evaluative approaches, both of which are practised and justified. The first is that which concerns the management of the concern or the project *per se* (time, efficiency, minimization of costs and maximization of returns) and which we could define as 'internal' evaluation. The second concerns the relationship and the impact of the undertaking, project or programme *with respect to its surroundings* (compatibility and coordination with other projects, positive or negative effects on the economic system in general, on the physical environment, on social conditions, conformity with, and level of, achievement of goals, etc.). This second approach could be defined as 'external' evaluation. In current terms the first is geared toward *efficiency of* projects, and the latter to their *effectiveness*.

Operational planning, in both versions, has meant an integration of approaches between the economic and engineering disciplines, and, more recently, between those of systems engineering, operational research, praxiology† and management science‡.

†As it has been called by Kotarbinski [46] and others.

‡If asked to present notable examples of this approach, we should recall the works of Simon [72–75]; Churchmann (see, for example, [19, 20]); Ozbekhan (see first and foremost his general report to a meeting of the OECD [63]); and Ackoff [1, 2]. As for expression directed at the integration of economics and operational research, apart from the works of Kantorovich [44] and his school, and of Dantzig [21] (republished in Koopmans [45]), we have in mind a work by Bellman [16], the works of Dorfman *et al.* [22], and a volume by Baumol [15], which are particularly representative of these approaches.

These approaches have constituted the direct premises for consideration of the systemic relations between micro- and macro-programming, and between the internal evaluation approach and the external one. This greater attention given to systemic relations has therefore constituted the basis for the framework of operational planning: at the level of single 'planning units' (where it was born) out of the logic of 'projects'; and in the more vast and more complex planning whole, in the logic of 'programmes' and 'plans'.

We may define this 'framework' not as a rejection or critique of micro-projecting, but rather as the emergence of macro-planning as a prerequisite that gives micro-projecting (and operational planning for which it acts as a vehicle) the guarantee of 'optimal performance', and thus avoids the persistent risks of 'sub-optimal performance'†.

This has been not only the technical meeting point (operational analysis applied to macro-economic theorems), but also the 'political' meeting point (programming of public expenditure) between operational planning and macro-economic planning (as planning fields of action). In the shape of the programming of public expenditure, it has generated 'systems analysis' for the various public programmes. After having begun in the U.S. in the defense programme sector, it was then extended in the 1960s to the programmes of the Federal Department of Health, Education and Welfare and, subsequently, to most, if not all Federal agencies, by means of the PPBS. It has thus certainly constituted an important strand in planning activities‡. It was then extended to all levels of public spending and to many other countries. However, it too is now in a state of crisis.

As in previous cases, this has also been obstructed in various ways by disciplinary schools and tendencies, not least here by 'macro-economic planning'. That is to say, the systemic approach should have convinced relevant folk that operational planning of public spending was not contradictory but, rather, complementary, when necessary, to macro-economic planning. Likewise, it could be complementary to social planning (to which it is related), and also to physical planning.

Operational planning of public spending (or simply its programming) has furthermore become the ground on which various disciplines have met, and, in part, clashed: above all the administrative sciences, with their fund of 'transdisciplinary' techniques deriving from systems engineering and operational research, with economic–political analysis. This meeting, which has been enriched (and, in some ways contested) by sociological analysis of the relationship between 'public' or 'social' choice and 'individual' choice (about which a sophisticated debate has taken place which shows no signs of attenuating),§ has resulted in a complex science, or theory: that of 'political decision science or theory', or, simply, 'policy science'‖.

## THE MERITS AND LIMITS OF THE TRANS-DISCIPLINARY APPROACH

Concluding this critical survey of planning's different fields of activity, and their emerging inter-relations, it may be said that operational planning, in both the micro- and macro-versions, has represented the decisive factor in bringing together and integrating these fields. This has occurred due largely to its advanced technical baggage, which operational planning has introduced to the various fields (being heavily based on mathematics and its auxiliary, statistics). Operational planning has thus been presented essentially as a bundle of advanced techniques. It has been

†The author has elaborated on these aspects in another work [9].

‡For a general overview, see the works of Schultze [66, 67]; the essays collected by Novick [57], and those contained in a publication of the U.S. Congress [89] on the experience of the PPBS. For more theoretical aspects, see McKean [52, 53] and Olson [62]. There is a useful panorama in Haveman [38].

§I refer to the debate concerning the possibility of social choice developed by 'welfare-economics' economists (the major exponent of which is Arrow with his fundamental text of 1951 [13], and also his more recent work in collaboration with H. Raynaud [14]). Also to be remembered is the work of A. K. Sen [69–71]). We refer also to the contribution given by 'public choice' theory from 'public economics' scholars (see, as the major exponent, Buchanan [17, 18]). A vast review of the debate, with an exhaustive bibliography may be found in Mueller [54].

‖See, above all, Dror [25, 26].

considered mainly of instrumental character, and thus seen as trans-disciplinary, to be applied to every field at every level from micro- to macro-programming.

*Merits*

The techniques discussed above possess substantial merit, above all, that of creating a new arena for trans-disciplinary encounters between the various fields of planning, each of which is bound to its 'base' disciplines: economics, political science, sociology and the environmental sciences. This has prompted a series of typically multi-disciplinary research and analysis efforts, largely due to the use of trans-disciplinary techniques†. These research currents are beginning to look increasingly like disciplinary integration, though they still have some ways to go. Elsewhere, an attempt has been made to map these movements, using a kind of 'disciplinary map'‡.

A high point was the foundation of *Socio-Economic Planning Sciences, An International Journal* in 1968. During its nearly 30 years of existence, this journal has sought to represent a melting-pot of experiences, tearing various planning scientists from their original environments (and corresponding journals)§.

Furthermore, these techniques have had the merit of unifying the operational approach inherent to each field of planning. In other words, it has provided a programmatic, policy- or decision-oriented, direction to the traditional base-disciplinary analysis.

The operational approach appears to have pushed several of the currents of research which it influenced out of the base disciplines' positivist wrappers. To the extent that they were so liberated, there opened a programmatic approach—which we choose to call 'planological'.

Nevertheless, this approach, which we have defined as trans-disciplinary, has shown, and will continue to present, certain limits, discussed below.

*Limits*

Above all, the use of analysis and evaluation techniques applied in the various disciplines has prompted the development of a high level of sophistication of these techniques at the cost of adequate methodological reflection as to the validity and comprehensiveness of the results.

There has been a tendency to make *techniques* privileged, while disregarding *methods* (if such use of two words, which are often confused, may be allowed). By techniques, we intend instrumental use of mathematical language, for example, formalization through algebraic expressions (with or without the possibility of quantification), and thus modeling of the relationships between the phenomena that have been selected for construction of the reference system, subject to analysis and planning. By method, we intend the identification of phenomena to select in order to shape the set of objectives or problems to be resolved (in whatever environment or state of reference); the conceptualization of the existing relationships between these phenomena, their contents and their contexts; and the procedures for evaluating the alternative courses of action possible in pursuit of the objectives or solution of the identified problem(s).

The tendency to favor techniques over methods has reduced the capacity to confront various problems critically within an adequate framework, and to avoid permanent and chronic sub-optimalization‖. Furthermore, it has impeded the birth of a proper management system, even

†Inter-disciplinary relationships have been subject to various lexical classifications. In Appendix 1, the following have been reproduced: (A) a proposal [65] with which the author is not particularly satisfied, suggesting that it be substituted with a much simpler one, here indicated; and (B) a disciplinary definition by an OECD study group [58]. A modified version of inter-disciplinary taxonomy proposed by Pettman is reproduced in Appendix 2, a version already published elsewhere [11].

‡The "Map of Currents Toward Planology" was constructed in Archibugi's *The Introduction to Planology* [10], which has not yet been published, but of which a provisional version circulates (and to which the present relate).

§Of course we have quoted this journal (of which the author had the honor of being called to serve on the first Editorial Board by the founder, Sumner N. Levine) as symbolizing the vast range of new directions of research within planning, not as an exhaustive list of the same. Even just considering scientific journals, it would be impossible not to mention the subsequent birth of *Environment and Planning* (1969) (of which the author similarly took part in the Editorial Board), of *Policy Sciences* (1969), and of the *Journal of Policy Modeling* (1979), not to mention the stimulating openings toward the new approaches by journals of the traditional disciplines in the fields of economics, sociology, administrative science, urban studies, and regional and environmental sciences.

‖On the risk of sub-optimization, see an essay by Papandreou and Zohar [64].

in the case of merely technical consultancy to planning processes carried out individually by analysts or planners.

In the second place, the trans-disciplinary use of these techniques may have *slowed down* fundamental change of the approaches that a thorough methodological discussion might very well have introduced. This new approach would allow the emancipation of planning from the conditions of its base disciplines, which are, to a great extent, responsible for the current (negative) situation. Inasmuch as the new approach is the pivot of the much sought new disciplinary integration, it merits brief discussion.

*'Positivist'-type decision making analysis*

Operational analysis as applied to economics, social plans, physical plans, etc. does not impede the normative 'moment'; on the contrary, it calls for it. Even the modeling on which such procedures as linear programming is based is, by nature, oriented toward decision-making. Nevertheless, the structure of the phenomena (variables) of which the model is composed, and the relationships between these phenomena, are the result of objective analysis of the system in question, be this economic, social or physical–ecological, etc. and be it international, national, regional or urban in scope. The starting point is always 'positive' identification and 'configuration' or reality, including the constraints it represents. This is the base on which variables are selected: target variables related to objective-values, and instrumental variables that are supposedly under the control of the decision-maker(s). Given the system of 'positive' relationships and constraints, the decision-maker should be able to make an informed choice between alternative courses of action.

'Knowledge before decision' is the motto of this conventional approach to the problem of planning: as obvious and trivial as it is accepted and recommended. Who can deny the importance, and even necessity, of analyzing and knowing the ways in which things work in order to be able to govern them—as if they were natural phenomena?

Economics, political science, social sciences, ecological, and urban and regional studies all supply the *data* that allow the analytical models prescriptions when necessary (crises, problems, concerns, etc.). Despite its use for decision-making, this approach remains 'positive'.

*Social reality is subjective reality*

But what is this 'reality' which is so objective that it is necessary to know its functioning before going ahead with prescriptions, recommendations, choices and decisions? In the case of social science and planning, this is not a matter of a reality of nature which has its own inviolable laws. The case is one of a reality of human behavior, the behavior of individuals, groups, classes, ethnic and cultural groups (in the anthropological sense). This behavior varies over time and with circumstances, and even with moods and fashions. These are not realities for which it is possible to study and determine unequivocal behavioral laws, either for groups or for historical moments and circumstances. Social behavior, and thus also social objectives, are so variable as not to allow us to create models and parameters in a 'positive' way.

We are dealing with a reality composed of behaviors (of individuals, groups or societies) that the decisions themselves tend to define, explain and influence. In other words, this reality is a function of the decisions, within given constraints.

The 'system of reality' as a whole does, however, not amount to an *independent* variable in the decision making system. On the contrary, it is heavily dependent, not only due to the effect a decision can have on it, but also because its creation is based on the objectives recognized in the decisions. This is not to say that there are no limits, but rather that the limits are of structural kind rather than behavioral. There are given material resources, but the freedom of choice is complete.

Granted, within a framework limited by time, place and level of development, such behavior may begin to seem similar and to feature a good deal of regularity; it is certainly always worthwhile knowing past behavior in order to judge the possibilities of the future. A number of 'theories' have been formulated concerning such supposed regularities, but exaggerated scientific value has oftentimes been attached to these. Indeed, many calculations based on probability have proved correct; but in the case of complex decisions and choices, how can the reasoning and

decision-making model be said to have a 'scientific' base when the latter's assumptions are so fragile, with the uncertainty coefficient deriving from the ingenuous 'scientific' method itself?

When decisions have to be made concerning the future, would a community not do better by (as individuals do) incorporating the behavior of groups and individuals into the decision process *ex ante*, while considering methods for simulation of this behavior, rather than reproducing set parameters obtained from uncertain data collecting *ex post*?

Thus, in this case, the existence of a normative approach, different from that extracted from 'positive' analysis is beginning to stand out.

*'Voluntarist'-type decision making analysis*

An approach is now beginning to take shape in which the modeling of reality would be based above primarily on *structural* relations selected with the problems and objectives of planning. Its aims will not be pragmatic but heuristic: to measure the technical coherence and feasibility of the choices and of the preferred set of options.

As far as behavioral decisions are concerned, these should be: (a) drawn up by whomever has been charged with deciding on behalf of society; (b) evaluated by similarly charged politicians; and (c) subject to negotiation with interested groups and individuals who enjoy liberty and autonomy in forming and expressing preferences, thus affecting the implementation of community plans, giving rise to the distinction between the 'voluntarist' and the 'positivist' approaches.

From this point of view, there would be no economic behavior which, once studied and codified in economic theory, required verification in light of other values and criteria. Neither would there be social behavior which, naturally belonging to social analysis, needed to be confronted with the theorems of *homo economicus*. Nor would the logic of group action have sense any longer, as an irrefutable factor obstructing any intention for reform of social behavior.

From this point of view, the 'whole' man would choose; and, in our case, the whole of society would do so, or, rather, its legitimate representatives. The community thus decides in accordance with its preference scales, which have yet to be defined, or have been determined through bargaining in accordance with established procedures. The preferences are then viewed as part of various complex values which are rather difficult to attribute to specific sub-systems.

In fact, the distinction between the economic, social or political nature of things fades with the formulation of preferences, based on a well arranged system of objectives. This is expressed in the programme structure—or a complex logical frame (*log-frame*) of the system of objectives. The (rationally expressed) objectives remain on one hand, the instruments with which to pursue them on the other. Similarly, the issue of coherence and consistency of the said objectives remains, as does the question of coherence and consistency in the use of the instruments†. The classical relationship between objectives (of use of available resources) and the means (in terms of the availability of resources) also remains.

This 'voluntarist'-type approach characterizes the new discipline, as it synthesizes and overcomes the planning sciences and transforms them into one 'planning science' (or, rather, Planology).

Thence the change of 'knowledge before decision' to 'knowledge through decision'. The same selection of variables for the model-building effort is carried out, not in deference to an 'objective' reality, but rather in deference to the entirely 'subjective' one, which the planners are seeking to change, inasmuch as they have constructed purpose-built problems, values, aspirations and objectives. The analysis follows a first formulation of problems and objectives, and is born as evaluations of the obstacles, difficulties, feasibility and constraints inherent in the pursuit of these objectives. In other words, the analysis is geared toward the programme, and the only variables (and relationships between them) analyzed are the ones relevant to the programme.

Summing up, the assumption (which has been developed more extensively elsewhere by the author [10]) is that the trans-disciplinary approach, though decision-oriented, remains 'positivist' inasmuch as it is anchored in the positive paradigms of the base sciences (economics, sociology, etc.). The qualitative step taken by disciplinary integration thus occurs as one of adopting a

†The most complete and probably clearest formulation of an integrated logical planning process is that of Johansen, by means of his "theoretical decision-making planning scheme" ([42] chaps. 2.1 and 2.2). There is a vast epistemological treatment of the planning cognitive process in Faludi [29].

'voluntarist' approach, where planning science parts from its paradigm of the planning process itself.

During the planning process, little or no distinction is made between the social and economic objectives that must be made compatible. The coordination is an internal part of the decision-making process, which begins from the goals wherein all conditions and marginal constraints are operationally analyzed, as is the issue of feasibility.

The *trans-disciplinary* approach effectively becomes one of *neo-disciplinary*, while the new discipline frees itself completely from the old one.

*A defect of approach or one of further elaboration?*

The new integrated planning discipline (or planning science, or planology) must find new common bases; i.e. common to any plan typology (or any field of planning) within which it is applied.

Such bases consist of the consolidation of procedures of analysis, of evaluation and of decision. These are the *common store of any planner* in whichever field he or she works and whatever the plan being applied. Notwithstanding certain schematisms introduced by operational planning, which is, above all, aimed at the management of micro-units and micro-projects, these schematisms have not yet been elaborated, discussed or consolidated sufficiently on a complex community scale. The 'facet by facet' mentality still appears to prevail in the planner's activities; it is so much simpler and more easily understandable. It obtains greater consensus due to its banality and the fact that it involves a less complex and intellectually more manageable vision.

Planning science has thus yet to be born; let alone be 'rethought'! Until now, one has worked in what we view as relative disorder. Whilst claiming to be rational, one has acted within substantial irrationality—not only on the part of the political decision-makers (who sometimes sacrifice wisdom and duty for political success), but also on the part of the planners who should act as the critical conscience of the decision-makers. Whether on a territorial or sectorial scale, nowhere in the world do we have reliable frames of reference at our disposal, that indicate the capacity to apply a methodology or even a basic 'systemic' consciousness.

In Italy, if we add up the demographic predictions of the regional and local master plans produced by the illustrious profession of urban planners, we will find that we should be a country of at least 300 million inhabitants. And then we have the courage to say that our planning was imbued with too much 'rationalism' and that is why it failed! Rather, we believe it failed because it was *not* planning, and because in most, if not all, situations it was pseudo-planning (as Dudley Seers defined it as far back as 1972 [68] in the full flowering of policy sciences and programming); and because planners were the first to abdicate from the task of elaborating with the due tenacity and patience—against political adversities and fashion cycles—the procedures and methods of planning evaluation.

Quantitative planning has been paralyzed by the dearth, if not absence, of appropriate data, despite the fact that the whole world 'change' that we have lived through has aimed at making the collecting and processing of data more feasible and effective. Qualitative planning has also been paralyzed by a lack of trust in gaining collective preference with suitable organizational tools and with suitable institutional procedures. Here, certainly it is necessary to rethink old institutional schemes and new proposals of 'constitutional engineering' that fit better with planning procedures! Even in the institutional field, a lack of confidence in rationality has led to a serious lack of imagination and initiative.

Myrdal (we believe) told a conference of the American Institute of Planners held in Washington, DC in 1968, that the most frustrated profession was certainly that of the planner, but nevertheless they should be proud, because, in the long run, by dint of their predictive, rational capacities, they would be the profession most up with the times and the one the world would have most need of. We are not certain whether Myrdal would be happy today to see the degree of defeatism that exists within the camp, but it is certain that his claim has not lost any validity†. This, even when bearing

†Incidentally, the same is valid for Myrdal himself. In fact, during the time when the Welfare State was the fashion, he went against the grain by recommending going "beyond the Welfare State" with arguments that are more relevant today than 30 years ago. He asked that the Welfare State be administrated with more 'planning', so that the social groups became used, in negotiating the plan, making choices, implementing trade-offs, and expressing 'preferences'; and not just to pressing for social services, as a political demand, that could not be sustained with an objectively limited public budget [55].

in mind the changes that have taken place in the meantime, since, today, it is hard to imagine a development that is aware of international and inter-regional relations, and an efficient management of communities, without a contribution of more advanced methods of management than those allowed by a day-to-day policy.

The role of the planner is not to be successful 'immediately'. It is, rather, that of showing how to manage the common good, and, primarily, that of creating good planners who are capable of transmitting their professional ability.

This ability seems barely evident in today's planners. Neither do we see much of it in our Universities or in those coming out of our Universities to carry out their role in the many and varied administrative bodies. So what 'failure' can we talk thus about?

Instead, we have a very important task: that of the further refinement and elaboration of our discipline, and of giving it a more precise identity and a more organic, systematic and greater capacity, as well as that of integrating its various aspects. Until we are able to do this, it is our belief that we do not have the right to talk of failure.

## THE FIRST ROUTES OF THE NEW DISCIPLINE

We propose that the lines of further refinement and elaboration within the logic of an integral re-establishment and unified approach include the following:

(a) the elaboration and strengthening of the unitary procedure scheme in the preparation of plans; with the relative indication of the phenomena (variables) to be quantified in the various phases of preparation of a typical integrated plan;
(b) the strengthening and definition of schemes of the systemic inter-relationship between the various levels of planning and, thus, of the various plans;
(c) the design of institutional procedures (and relative institutions) for plan bargaining at all levels; not to mention the design of consultation systems of the opinions and preferences of the participants interested in the plan;
(d) the design of suitable information systems (and of their management) that correspond to the preselected variables and to the accounting systems instituted (according to the previous points); and
(e) the design of monitoring systems and those of evaluation of the operational capacity of the plans, and of a periodical review and updating of same.

The literature on planning has not produced enough in this direction: neither in the shape of proposals, nor as a result of experience. It seems that 'suitable' text books do not exist that are precise, exhaustive and sufficiently didactic. That is 'Treatises' that treat the subject systematically (as we have had in the fields of economics, sociology, and even the regional sciences—as Isard's well known book of 1960 testifies [40]. We also suggest his 'general theory' [41]). There are, on the other hand, many interesting papers on this or that subject, or this or that experience; there are many brilliant pamphlets, even of voluminous bulk, that are useful for the development of the critical spirit (which is certainly very important), but not for the possession of a reliable methodology. We are all aware that in confronting the preparation of a plan we have had to invent, case by case, a new methodology *ex novo*, and that we have found little support in our libraries. Neither have we found in the documents on produced plans (apart from suggestions and hints), adequate 'ideal-type' models to follow.

### *Schemes of procedure for the preparation of plans and the construction of suitable 'accounting frames'*

The first field of elaboration here is that of the methodology of plan preparation. Among the scientific community of planners, one should discuss and formulate a standard, an ideal model to follow. Above all, we suggest this be done with regard to which categories of 'objectives' to insert in a 'programme structure', which articulation of the target-instruments linked relationship to suggest and prefer, which level of aggregation to accept for the phenomena (variables) to be quantified, and which indicators of state, of achievement, of action, etc. to identify in the diverse typologies of the community plan.

It is in this sphere that one should identify and construct the models and the accounting frames to be used for all the analyses of consistency between plan alternative evaluations and plan hypotheses. In this regard, surprisingly little has been done by the scientific community of planners. There are rather abstract and theoretical analyses on the subject of the building of decision-making models, of spatial interaction, of the input–output relationship, etc.; but they have been little elaborated in view of their insertion into the 'entire' plan procedure. The level at which there is a greater abundance of operational models is perhaps that of the entire national economy (with special credit given to the noteworthy contribution of input–output analysis, which was, however, frustrated greatly by a serious lack of accounting data). But at this level as well, the prevalent approach has been 'macro-economic', and therefore somewhat partial: the attempts to build a 'system of models' for planning on a national scale with a strong correlation of variables have been hurt by scarce political and financial encouragement. The scientific community itself has not been sufficiently tenacious. We can then only imagine how the political and administrative bodies have behaved!

On the subject of 'planning model systems', a UN seminar was held in Moscow in 1974 for those econometric experts who had been working in both Western and Eastern planning offices. The problem was discussed with all seriousness, although little actually resulted from the seminar [84]. As noted previously, we view that seminar as the 'swan-song' for the development of planning 'model systems'. This author presented a paper at that seminar on the Italian experience of an 'integrated' formulation of a 'models system' in which there was linked to a Leontefian 'central' input–output model a range of 'sectorial' resource-use models—activated by a system of social indicators—that were translated into goods and services through suitable transition matrices [4]. The models system was a rough methodological outline of an experience that should have been developed by the (official) *Istituto italiano per gli studi di programmazione economica*, but was, in fact, cut short by the chaos in all fields of economic planning in Italy as a consequence of the oil crisis. We thus suggest that discussion of planning modelization on a national scale should be taken up again from the point at which it was left, i.e. from the 'system of models'.

On the other levels—sub-national, i.e. regional, urban, etc., and supra-national or even on the world level—we have much less interesting examples of modelization. Indeed, most of those available should be viewed with some reservation due to the lack of systemic binding.

At the regional and urban levels, on the other hand, there is an abundance of modeling. The majority of these models are 'descriptive'; only a few are linked to real planning processes. Most have a 'positivistic' basis: knowledge before decision. Also generally lacking is their systemic relationship with meta-regional decisions†.

'Global' modelizations remain at a generally elementary and descriptive level; including even that carried out in the general study by Leontief himself [50] for the UN. Other studies (like those of the Club of Rome), are of a purely exploratory and 'predictive' nature, and are certainly non-decision-making in the sense considered here. Further, they have come to a halt also as a result of the generally poor quality of the available data.

However, in order to perceive how planning procedure could progress in the direction of this first field of elaboration, we recommend Leontief's masterly essay in which, in a plain and simple form, he explains what he understands by (national) economic planning [49]. By following his scheme, it is quite possible to construct a standard planning process that also applies to other relevant levels. Leontief himself set forth, in a seminar given in Rome at the Planning Studies Centre in 1964, the possible developments of planning technology [47]. His views have remained quite relevant, since, from that time, what we would view as a more appropriate planning methodology has not emerged.

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†A good, classic synthesis of this type of modeling is given by Wilson [92]; amongst the best 'operational' structurings of modeling are those studied by Fox: Chap. 12 of Fox *et al.* [32] on the 'Theory of quantitative economic policy with applications to economic growth, stabilization and planning', and in Chaps. 8 and 12 of Fox [30] on 'Social indicators and social theory: elements of an operational system'.

*Schemes of the systemic inter-relationship between plan levels*

This is a field of elaboration that is employed even less by the scientific community, perhaps as a consequence of the persistent personal separation of the individual scholars of the national level from those of the regional and urban levels (a separation that should indeed be removed by a new way of understanding the planning discipline and the curriculum of studies linked to it).

In practice, all the 'constraints' that it should be obligatory to account for in the planning process (see above) should be listed and discussed; that is, those that belong to the analysis of the phenomena of the superior or inferior level to that in which one operates. In other words the exogenous constraints with which a plan must reckon.

In practice, this theme is normally called 'plan coordination'. But, in the scientific sphere it is a question of defining technically which are the exogenous co-variables of different planning models at the operational level. Without a clear, compulsory consideration of these variables, any form or experience of planning becomes 'pseudo-planning'. It is a fear that, were we to carry out a survey on the awareness of the existence of the exogenous constraints in planning experience (especially at the urban scale) over the last decades in all parts of the world, we would discover that in more than 90% of existing plans it is completely lacking; and that this percentage strangely coincides with that of the failure rate of the said plans. This observation was made as far back as 1965 by Waterston [91], in a work that then represented a report on the vast experience of planning (in the ambit of the World Bank). We believe that since then it cannot be said that the situation has improved, but, rather, that it has become worse.

The research and studies of planners should arrive (by theory or experiment) at a particular 'norm' for the processes of plan preparation, in which the explication of the constraints and external conditions on which the analyses and 'internal' evaluation of the plan are based (as terms of reference for the carrying out of a 'good job'). Such assumptions should be present either as data, or as estimates, or as simple hypotheses; they should, however, be present while also being the object of controls and negotiations (with appropriate participants) like all other contents of the plan.

*Institutional procedures of plan bargaining and preference consultation systems*

Not only for their implementation, but also for their preparation, plans need to assume and presume 'behavior' and 'preference' guidelines on the part of the subjects interested in the plan: whether they be passive subjects such as consumers, users, and, in general, the 'target-subjects' of the plan, or the active subjects such as entrepreneurs, small or large private or public operators, trade unions, or the actual political decision-makers.

Marketing analyses are excellent tools for the evaluation *ex post* (statistically) and *ex ante* (polling) of behavior. They have been little practised by planners as by public operators in general; although they are used much more in 'corporate planning'. But the opinions and preferences of various interest groups can be collected and measured consistently with modern systems of control that few now apply. It is difficult to understand, for example, why TV audiences are constantly monitored, while the same is not done for patterns of behavior and preferences that are much more important for political operators, while representing decisive factors for the well-being of the community in the hands of planners. But on what can we base this monitoring if we have not beforehand constructed and organized the indicators a given plan needs (see 'Schemes of procedure for the preparation of plans'..., above)?

This does not mean that we must not also perfect the design of organized forms of plan negotiations, with certain groups and subjects being identified as strategic in the creation of a collective preference function, let alone for the subsequent implementation and management of the plan.

Above all on a national scale, but also on other scales (sub- or supra-national) that repeat the constitutional scheme of the national one, the task of the scientific community is that of studying and proposing institutional and operational reforms that fit the needs of plan management. Any of today's institutional systems—founded on 19th-century constitutional schemes—is generally incapable of carrying out the management tasks of a planning State or of a planning Society. This situation is even worse for any State that has to rationalize and control those expenditures that

reach the equivalent of more than 50% of national income (from the approx. 5% that it was at the middle of the last century).

For most Western countries, the actual procedure and structure of public budgeting (of states, regions, municipalities) is based on schemes introduced in the last century. If we do not wish planning to fail, clearly it will be necessary to construct a transformation and adaptation of expenditure procedures to the schemes of planning decisions.

The American experience of the PPBS, created in the late 1960s, has not realized its proposed potential. This outcome is even more stunning considering that it represents the most advanced experience of adaptation of public expenditure procedures to the needs of planning in the Western world. Despite the less-than-positive outcome, it has left some very important traces that are (wrongly, we believe) considered by a 'deregulation' process; e.g. the principle that every administration must show that the costs of a public activity must be lower than the benefits such activity produces. The scientific community of planners must therefore relaunch—at least at a study level—processes and methods of public expenditure evaluation as one of the most important pieces of the general planning methodology framework.

*Information systems for planning and their management*

A field that requires elaboration (and which has hardly yet begun), is the planning of information systems in harmony with the system of planning already introduced. The application of information systems has allowed us to make great technical progress in the last few decades; one must thus ask why these systems have not been introduced to the field of planning. One might reply that progress has been made where a 'demand' for information systems has arisen for existing or developing activities. Poor planning has not apparently represented such a 'demand' area. Nevertheless, we must not forget that one of the reasons for the difficulty planning has had in presenting itself as a current practice in the administration of the community (at all levels, including the national one) is that of information management: both for the simple existence of sufficient data and for the capacity of processing such data (given their complexity in the general planning framework). Given the level and pace of current technology, however, this obstacle should now be considered overcome.

Despite current circumstances (the overproclaimed "informatic revolution"), it unfortunately appears that in the case of collecting and processing data useful for planning, information technology has not yet yielded its full potential and support. Thus, information about key accounting phenomena still appears insufficient and incomplete. The scientific community must thus make every possible effort to plan 'accounting' systems, for the construction of which it must also identify the necessary basic data (see below, 'Integrating themes of the new discipline') needed to integrate the appropriate planning processes.†

*Monitoring and plan evaluation systems*

This too, is a line of elaboration for the new discipline in which there is still much to do.

It is well-known that a proliferation of studies and applications, taking a variety of directions, have appeared in the last 20 years. Paradoxically, these studies (which complement planning to such an extent as to merit the saying: 'No planning without evaluation, but no evaluation without planning'), have developed concomitantly with a decline in direct planning studies. From a historic viewpoint (according to the fashion of the times), they have appeared as a more concrete and more realistic alternative to the (unsuccessful) planning experience. In reality, this (false) alternative for (false) planning has been the planning by 'projects', that has been considered informally as a more modest and effective and less whimsical alternative to overall planning.

We know that, within an integrated and systemic approach, planning 'by' projects, without systemic reference to other levels of planning, simply represents the negation of planning. (The opposite would also be true: comprehensive planning, not backed up by analyses of feasibility at an operational level and by that of single projects would likewise represent a negation of planning.)

The flourishing of evaluation methods has, however, been in the ambit and *humus* of project analysis of all types: from the social to that of productive investment, etc.; and, it has been an

†The author elaborated, in 1975 [5], a 'design' for an information system for (national) programming that nevertheless remained a 'dead letter' because of the more general crisis, mentioned above, p. 92.

instrument of that micro-projecting in which a part of operational planning has manifested itself (as noted earlier).

A great challenge for the development of the new discipline of planning is, therefore, that of the development of the studies and methodologies of evaluation also in the ambit of macro-planning, i.e. community planning on an urban, regional or national scale. In this direction, there is a great deal of work to do. The evaluation of plans—which are still not interrelated systemically in the sense noted earlier (p. 93)—has ample application with the techniques suggested by a group of scholars that are an important part of the planology strands: for example, Lichfield [51], with his method of cost–benefit analysis inserted into the formation of the 'balance sheets' of evaluation; or Hill [39], with his method of evaluation considered with respect to achievement of goals. The instruments and techniques of multi-criteria analysis and evaluation have been studied on a vast scale and there are many available.†

In short, the application of these methods and techniques in a wider typology of plans implies a considerable amount of study and research which is not developing easily. This remains the case even if, at the level of the UN and of many other agencies working in the field of project-making, traditional project evaluation has been supplanted by the evaluation of 'programmes', thus presenting itself as an instrument of macro-programming.

## INTEGRATING THEMES OF THE NEW DISCIPLINE

Given our previous discussions, these are the lines along which the new discipline is being elaborated; then let us now examine some of the themes. The themes, we feel, require the most urgent consideration, as fields of their own, specific to this new discipline, are those of the most complete 'integrative' character *par excellence*.

### *Integration of systems of economic and social accounting*

This study area is of particular importance to the new discipline. Since the 'movement for social indicators', which has carried on rather tiredly since the end of the 1960s, has lost some of its initiative, it now seems opportune to elaborate on the ways of integrating social and economic accounting. The aim is to provide for this being used orderly and methodically as an instrument of, and reference frame for, a planning process.

In truth, social indicators originally came about as instruments for reporting on the state of social affairs. The first studies were developed in this sense, and showed a number of important results within the OECD 'Common Social Concerns' system [59–61], as well as in the System of Social and Demographic Statistics developed by Richard Stone for the United Nations Statistics Office [86]. Unfortunately, the former were never sufficiently pursued within the OECD, facilitating the general decline in planning studies. Indeed, for the latter an effective collection of data was, as might have been expected, never carried out.

The integration with economic accounts, which was more clearly geared toward political goals, gave birth to a series of scientific issues. Among the more illustrious examples are: the MEW—Measurement of Economic Welfare—by Nordhaus and Tobin [56], and the Japanese NNW—Net National Welfare—by the Economic Council [27]. The various 'integrated' systems of social accounting have since been discussed (see Juster and Land [43]). Of these, we draw attention to Fox and Gosh [33] and Terleckyj [77] in particular. The work of Karl Fox is of fundamental importance to this direction. He presented a System for Social Accounting [31] which could have been widely applied (statistically) today had planning been more advanced. Furthermore, Fox's work is evidence of how multi-disciplinary accounting may yield fruits wholly independent of the 'base' (original) disciplines (see Fox and Miles [34]).

Finally, the socio-economic integrated model developed by Drewnowski [23] in the UNRISD (UN Research Institute for Social Development) framework should be mentioned as a step toward the modeling of integrated plans. On Drewnowski's part, one sees the most extensive work on planning of the quality of life [24].

†For example Voogd's manual [90] on multi-criterial analysis applied to regional and urban planning and the collection of various techniques by Sinden and Worrel [76] for non-monetizing cases.

Despite the undeniable progress already made by this work, a good deal remains to be done in order to standardize procedures, thus providing planners with adequate and useful standard schemes. This is a study area that should prove fruitful to the new discipline. A summary of the themes of this area could be as follows:

(a) an increasingly developed theorization of social indicators; considering the ways in which the needs, welfare, demands and aspirations (of individuals, groups, the community, and public authorities) relevant to the objectives can be measured. This must be done in connection with the contents of the programme structure (see next section);
(b) the forms and techniques for extending the conventional economic system of accounts (SNA—System of National Accounting), the reforming and updating of which the UN has been discussing. The aim is not merely to obtain more complete measurement of welfare and development, but also measurements that are more operational with respect to the goals of planning systems; and
(c) the modeling to be used to link social objectives and their measurements to traditional (conventional, for instance, input–output; or 'new') accounting systems; all this using adequate indicators with 'transitional matrices'.

*Integration of socio-economic planning (and accounting) and technological forecasting*

This still-developing area of the new discipline is composed of studies that include the following:

(a) updating (and relevant methods connected to) the technical coefficient matrix in conventional input–output accounting systems, using the findings of technological forecasting;
(b) integration of technological matrices and professional labor factor matrices;
(c) methods of iteration and evaluation of interactive relationships between technological forecasting and socio-economic planning (this area could be called 'technological planning').

As is the case with many other study areas of the new discipline, this whole area is heavily conditioned by the availability of information, which, at the moment, is far from satisfactory. Thus, the first task here must be to identify the nature and potential sources of the necessary information, in order to render the contents of the area operative.

*Integration of socio-economic planning and territorial and environmental planning*

This area covers the many aspects of the relationships between spatial and physical factors, and the non-spatial and non-physical factors, of development.

The themes developed in this area have their base in the works of the so-called regional sciences. However, they should be rearranged subject to the heuristic logic of planning theory (as outlined earlier). The following are the most relevant of these themes:

(a) modeling of the component of spatial accessibility with respect to economic well-being;
(b) translation of environmental values into terms of socio-economic value (and socio-economic accounts);
(c) measurement and evaluation of environmental and urban quality (environmental indicators and the 'urban effect');
(d) methods of constructing matrices of demand and supply of territory; and
(e) accounting of territory (user-values and non-values) and transport (cost-benefit for firms and users).

It cannot be denied that the 'environmentalist' fashion today, and the 'regionalist' one of yesterday, have prompted great investigation and reflection in this study area, as well as extensive literature, even though the latter is conceptually rather disorganized. Within the new discipline we believe that the matter is also—beyond the continuation of this fervor of studies toward increasingly better approaches—better aimed research. This, in order to square the research being increasingly methodological with the preparation of physical–territorial plans, which are, again, compatible with the socio-economic reference frames (from the section 'Integration of systems of economic and social accounting'). This connection between the socio-economic and physical–territorial frames constitutes one of the pillars of the proposed new discipline.

*Integration of socio-economic (and physical) plans and institutional factor analysis*

This area of the proposed new discipline covers the many aspects of the relationship between conditions, constraints, institutional objectives, and the technical-economical feasibility of plans on one side, and the more general social limits to the rationality of the planning process on the other. The following lines of research may be listed:

(a) the in-depth examination and disaggregation of the accounting of flows and economic–financial transactions between institutional sectors or agents in economic accounting;
(b) analysis of the conditions connected to the behavior of sectors and of the institutional agents concerning financial flows (savings, investment, access to capital markets, fiscal levies, psychological effects of transfers, etc.) relevant to the processes and objectives of planning;
(c) analysis of new forms of non-commercial and non-profit making work and consumption (forms of auto-production and auto-consumption), their role in the formation and distribution of 'informal' income, and the connection between this 'associative economy' (or 'third system') and complex decision-making and planning processes.

As concerns the latter analysis, we must note that the 'third sector', or 'associative economy' (there are many names to define very similar activities: for example, informal economy, non-profit economy, 'economie sociale', and so on) has developed as an effect and, indeed, as a counter-effect of the Welfare State at least in its more present characteristic state. And, since the Welfare State is in crisis because of a lack of a planned and controlled demand for public services, the increasing volume of activities of the third sector could be 'programmed' within a framework of planning decisions. For a wider consideration on the relationship between the planning perspective and the increased third sector, see the author's report to an inter-governmental conference of the OECD in 1985 [8].

Until now, this area has been 'compartmentalized', whereas it should be included more in the institutional modeling of plans, and relative accounting.†

*Integration between socio-economic planning and institutional design*

This area of the new discipline is a part of all research, of various kinds and categories, which aims to elaborate on the relationship between the technical content of planning processes and methods on the one hand, and procedures for political decision-making on the other. The latter is obviously connected to various existing juridical, administrative and public arrangements.

This is an ill-defined field, which has ranged from the narrowly technical–juridical to the more generic issues of politics and sociology of political life. The lines of research of this area can thus be divided as follows:

(a) examination of 'technologies' for political evaluation of plans and 'rational' choice. This includes the various aspects of cost–benefit analysis, multi-criteria analysis, etc., not from the point of view of techniques used, but rather considering the way the techniques used develop and come to express the value judgments and preferences of the political actors involved. (This is directly connected with the discussion in the section, 'Information systems for planning and their management');
(b) examination of methods of non-institutional participation of citizens, users, and various types of actors in the planning processes;
(c) methods of political 'procedure' in socio-economic and territorial planning, such as:
    - the relationship between government and parliament;
    - the relationships between public and 'social' powers (e.g. unions, consumers, etc.);

†Unification of the institutional process has been put forward in outline by the author, without much success. See a report carried out for a meeting of the International Association of Administrative Sciences on the subject of the accounting and institutional instruments of a new form of planning [6].

- inter- and infra-governmental relationships, between various operational levels of planning;
- methodologies of plan-bargaining with large corporations and meso-economic powers.†

## CONCLUSION: THE (PROPOSED) 'PLANOLOGICAL' APPROACH

The study areas, listed herein in summarized form (each of which merits *ad hoc* treatment), are integrated areas of a study based on the adoption of a neo-disciplinary approach (cf. paragraphs in the first two sections of this paper), free of its disciplinary background. We have called this approach 'planological', thus distinguishing it from the disciplines from which it freed itself. The general, as well as specifical, epistemological characteristic of this approach has been discussed earlier in 'The merits and limits of the trans-disciplinary approach'. The section on 'The first routes of the new discipline' sought to trace the main routes along which the new discipline, 'planning science' (in the singular form), or planology, has developed. The areas covered by this new discipline, as summarized in the previous paragraph, are all of 'integrated' character, taken from different fields of various disciplines. They all have one common characteristic, however, that allows them to belong to the new discipline: they are 'plano-centric'. In other words, they are aimed explicitly at the preparation and implementation of plans. This implies an over-turning of analysis in many of these fields. Above all, this poses the problem of decision-making, and thus of the plan, at the base of each form of analysis of the kind evoked here, including integrated forms. This is, we feel, what makes up the 'planological approach'. Now, since this view represents perhaps the most distinct part of the proposed new approach, at the same time, it makes the process of introducing it into the current positive analysis of reality that much more difficult.

Perhaps it would be useful to sum up this approach with the words and authority of the founder of econometrics, Ragnar Frisch, who, on the occasion of a critical review of economic forecasting and planning said:

"During the last generation the shift from the on-looker viewpoint to the decision viewpoint has become more and more relevant in economic thinking all over the world as witnessed, for instance, by the world-wide United Nations survey 'Evaluation of long term economics projects' (Document number E 3379, 1960). In most countries the shift of viewpoint is, however, based on a kind of half-logic which I have never been able to understand and which, I think, will never be able to yield fundamental solutions. On the one hand one still retains the on-looker viewpoint, and tries to make projections on this basis (growth models of the current types). And on the other hand one will *afterwards* try to use such projections as a basis for decisions. How can it be possible to make a projection without knowing the decisions that will basically influence the course of affairs? It is as if the policy maker would say to the economic expert: 'Now you, expert, try to guess what I am going to do, and make your estimate accordingly. On the basis of the factual information I thus receive I will then decide what to do.' The shift from the on-looker viewpoint to the decision viewpoint must be founded on a much more coherent form of logic. It must be based on a *decision model*, i.e. a model where the possible decisions are built in *explicitly* as essential variables." ([35], pp. 91, 92)

The building of such decision-making models (naturally coordinated in a 'system of models') covering all the areas mentioned in the previous paragraph remains the essential and characteristic task of the new discipline.

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†For a clear delineation of a type of indicative and democratic planning that involves, with negotiation and participation, all citizens, we refer to that which the author said some time ago (together with Stuart Holland and Jacques Delors), on the political conditions for a development of planning itself [12]. See, also, the prospects outlined on occasion of the ISPE Forum on a new economic and social policy in Europe in 1982 [7].

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## APPENDIX 1 (A)

1. *Multi-disciplinary*

A variety of disciplines, offered simultaneously, but without making explicit possible relationships between them.

*2. Pluri-disciplinary*

The juxtaposition of various disciplines, usually at the same hierarchical level, grouped in such a way as to enhance the relationship between them.

*3. Cross-disciplinary*

The axiomatics of one discipline is imposed upon other disciplines of the same hierarchical level, therefore creating a rigid polarization across disciplines towards a specific disciplinary axiomatics.

*4. Inter-disciplinary*

A common axiomatics for a group of disciplines is defined at the next highest level or sub-level, therefore introducing a sense of purpose.

*5. Trans-disciplinary*

The coordination of all disciplines and inter-disciplines ... on the basis of a generalized axiomatics.
(From Pettman [65].)

## APPENDIX 1(B)

A more recent definition runs as follows:
A discipline is a set comprising three types of elements:

(1) Observable and/or formalized objects, both manipulated by means of methods and procedures.
(2) Phenomena that are the materialization of the interaction between these objects.
(3) Laws—whose terms and/or formulation depend on a set of axioms—which account for the phenomena, and make it possible to predict how they operate.

The items in this set, which have internal and/or external relationships, are revealed through phenomena that subsequently confirm or invalidate the axioms and laws.
(From OECD, Centre for Educational Research and Innovation [58].)

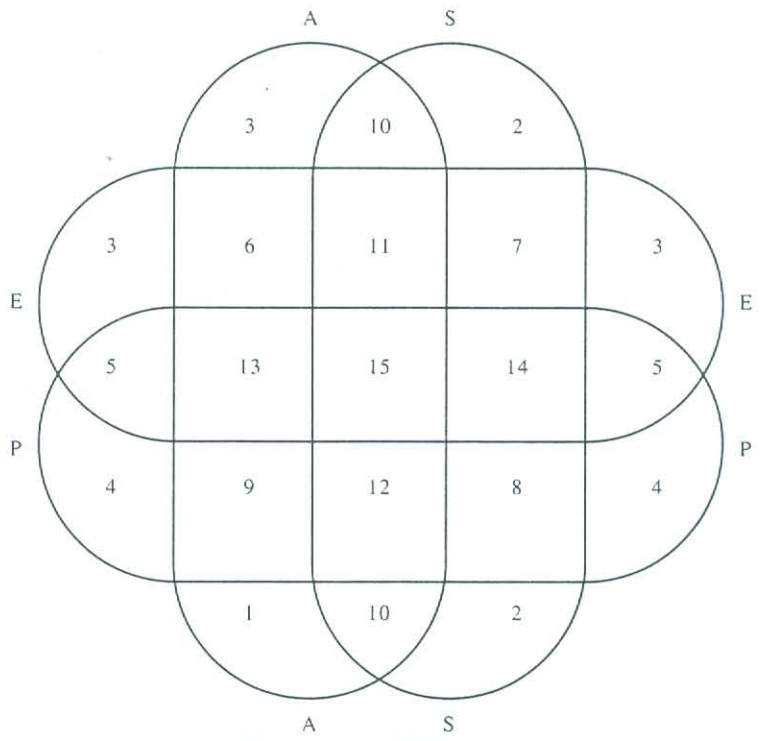


Fig. A1.

## APPENDIX 2

*The disciplinary framework of planology*

| | | | |
|---|---|---|---|
| Monodisciplinary | Envïronmentology or Ecology | (A) | (1) |
| | Sociology | (S) | (2) |
| | Economics | (E) | (3) |
| | Politology | (P) | (4) |
| Bidisciplinary | Economic Policy | | (5) |
| | Environmental Economy | | (6) |
| | Social Economy | | (7) |
| | Political Economy | | (8) |
| | Environmental Law | | (9) |
| | Sociology of the Environment | | (10) |
| Multidisciplinary | Urban Ecology | | (11) |
| | Environmental Politology | | (12) |
| | Economico-Political Studies on the Environment | | (13) |
| | Institutional Economics | | (14) |
| Neodisciplinary | Planology | | (15) |

(From Archibugi [11], modified from Pettman [65].)