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THE MAKING OF THE FUTURE: LIMITS OF AND ALTERNATIVES TO FORECASTING IN THE PLANNING PROCESS

You-tien Hsing

INTRODUCTION: FORECASTING AND PLANNING

One of the distinctive features of planning is its orientation toward the future and its attempt to cope with uncertainties about the future. In planning practice, the task of predicting the future is mainly materialized in projections and forecasts. However, when using projection and forecast in planning processes, we often encounter the problem of inconsistency between the forecast, the plan, and the outcome. In this paper, I will review the major limits of forecasting methods, then explore alternative ones. I propose that the problems of existing forecasting methods are mainly due to the use of pre-fixed and narrowly-defined models to apprehend the dynamic social processes in which planning actions as well as socio-economic and political forces interact. This general problem is to be analyzed at three levels. At the technical level, the need for manageable models and the lack of adequate information have been the major limits of forecasting; at the epistemological level, the static prediction of a contingent future has inevitably led to contradictions between forecasting and planning; at the political level, political use of forecasts and incoherence between political prerequisites of the plan and the existing political structure have greatly contributed to the problem.

The solutions to these problems can be found in a more dynamic and broader framework of forecasting. Technically, measuring as well as reducing uncertainty have been tried; epistemologically, it has proven useful to redefine the meaning of forecasting from static prediction to active anticipation; politically, participation has been suggested. These alternatives are to be seen as three joint approaches designed to deal with the interwoven problems of forecasting. They help create a more comprehensive and sophisticated version of projection; most of all, these alternatives are inseparable from a modification of the planning process as a whole.

My argument is organized into three parts, and this paper proceeds accordingly: the first section discusses the definitions of projection and forecast, and their relationship to planning. The second section focuses on the major limits of forecasting from technical, epistemological, and political perspectives. The third section explores the alternative forecasting and planning methods which might resolve problems identified in the second section.

I. DEFINITION OF PROJECTION, FORECAST, AND PLANNING

A. Definition of Projection and Forecast

Before exploring problems and alternatives, it is important to clarify the differences between projection and forecast, and their relation to planning. Nathan Keyfitz (1981) and Andrew Isserman (1984) have suggested that projections are conditional ("if, then") statements about the future. For example, "if current birth, death, and migration rates continue, the population of California will number 35,000,000 in the year 2000." In making such a conditional statement, the researcher has not claimed that the rates will continue or that the future population will be 35,000,000. A forecast, on the other hand, is a statement of the most likely future. The key difference between projections and forecasts is that, in the second case, the analyst is willing to take the responsibility for identifying the assumptions which are most likely to be true (e.g., whether the rates will remain stable). Given this key distinction, planners are usually expected to use forecasts to make decisions such as how to allocate land or to determine the need for hospital beds. In such cases, planners need a definite forecast of the number of people expected to be in the area, and not merely a hypothetical number based on a conditional statement whose underlying assumptions have not been evaluated. Usually, projections are expected to be used as a basis for forecasts. Nevertheless, in practice, the distinctions between projections and forecasts are seldom as clear as they should be. Planners usually use projections when they should use forecasts, because the former have clearer standards to follow and are easier to update (Moen 1984).

B. Relation Between Forecasting and Planning

Theoretically speaking, forecasting is an effort to predict what will happen; planning is a further decision on what ought to happen in the future. But their actual relationship is rather complex. On the one hand, forecasts tend to be self-fulfilling. Areas forecasted to grow may do so partly because people and firms are attracted there by the prediction of jobs and markets, especially when public infrastructure is also provided in anticipation of the forecasted growth. On the other hand, planning decisions, such as where to locate federal facilities, will also effect population change. If the forecasted future is undesirable—for example, if a city is forecasted to decline—the objective of planning may be to prevent this "most likely" future from occurring. Such an intricate relationship between forecasting and planning has created some problems as well as opportunities for planners, which I will explore in the following sections.

II. PROBLEMS OF FORECASTING

Critical assessments of the accuracy and deficiencies of forecasts have been cited widely. This section discusses the technical, epistemological, and political limits of forecasting.

A. Technical Limits

As Keyfitz (1981) has pointed out, forecasters, although fully aware that the future will be different from the past, cannot avoid assuming that the future resembles the past in important respects—no matter how sophisticated the forecasts may be. Take population forecasts as an example: the aim of the widely-used method of mathematical trend extrapolation is to search for an equation that describes population changes over time. The equation of the annual growth rate that fits the historical data will be assumed to be correct for the future. The analytical effort consists of identifying the trend and then projecting it into the future. Typically, lots of equations are run on the computer, from which one is selected that best describes the past pattern of change and is reasonably close to the most recent population count or estimate.

One dilemma of this trend-extrapolation method is that it is difficult to decide which years (time periods) should constitute the historical data base. For example, a typical midwestern county experienced population growth between 1850 and 1900 while the area was being settled; the population declined until 1970, reflecting the mechanization of farming and the displacement of hired farm workers; and, between 1970 and 1980, the population increased again, a change consistent with the nation's population deconcentration (Long 1981). The question is: how do forecasters decide which of these trends should be extrapolated into the future population growth of the county? The last one? Perhaps, but is a ten-year period sufficient?

Another technical limit of forecasting is that the development of social phenomena depends on many variables and the interactions among these variables. However, in order to keep things manageable, some variables must still be set as external to the forecasting model. For instance, the economic-demographic method of population forecasting relates population change to economic conditions. Usually, this approach begins with a determination of economic activities (e.g., employment) and then bases population changes recursively on economic changes. Although this approach includes far more variables to determine population change than many other methods, some variables still must be kept external to the model, such as forces from outside the region (e.g., export demand) or variables affected by political choice (e.g., federal military spending or interest rates). These exogenous elements are usually assumed to be constant or to follow their historical

time trend. Moreover, this approach also assumes that the structure of the model (e.g., the coefficients, ratios, and equations built into the model) will remain constant. For instance, if a forecast predicts an exodus of manufacturing jobs and high unemployment, but increasing wages in manufacturing, we will have to ask how wages are determined. Perhaps in that period wages are fixed by long-term labor agreements so that they do not decrease when unemployment increases; but will the unions be able to renew such agreements if employment continues to decline?

These substantial questions are not considered even in the most sophisticated economic-demographic models. In addition, as Alonso (1968) has pointed out, even if the variables in the model are all crucial and there are no key variables missing, there are still problems of data availability and accuracy. Stephen Cohen's (1977) study of the French planning model in the postwar period elaborated on this problem of insufficient information. According to Cohen, there are two major components dominating postwar French planning. The first component is the concentration of resources on the long-term development of a limited number of "basic sectors" (e.g., steel, energy, transportation) carried out through the cooperation between the planners and large companies, together with other state agencies. The second component is the preparation of a general resources-allocation plan. The plan takes the form of an input-output table which shows sectoral interdependencies in the economy. The table relates the effects of a change in any industry on all other industries. For example, agricultural production is strongly influenced by government support policies; but a change in government policies will result not only in a change in output from the agricultural sector, but also a change in inputs purchased by that sector, and a change in final demand generated by farm incomes. Tractor sales are therefore strongly influenced by government farm policies, and rubber production is in turn affected by the demand for tractor tires. All these relations need a coordinated set of detailed demand projections for each major sector of the economy, and a projection of quantitative output targets in the form of a general equilibrium system.

Besides the political implication of such a comprehensive scheme that encompasses all major resources allocation decisions, there are also problems regarding information availability. Despite their efforts, French planners found that actual economic performance still diverges greatly from what the plan predicted. Cohen explains that this is because even the best econometric analysis can never reveal the opportunities that have not yet been created by technical innovation or new commercial ventures. Therefore, the potential growth of the economy is often either underestimated, which restrains economic activity, or overestimated, which results in inappropriate investments. In brief, the

technical limits of forecasting mainly come from the problem of predicting the future on the basis of the past, the limits imposed by model manageability, and the inadequacy of available information.

B. Epistemological Limits of Statically-Defined Forecasting

As discussed in the introductory section, the relationship between forecasting and planning is complex: we want to know what the future will be like so that we can plan and act accordingly, and yet plans will influence what the future will be, possibly negating the forecast. Therefore, if forecasts are predictions which do not incorporate the possible impact of proposed actions, and if the objective of planning is to affect the future with some degree of control, then there is an inevitable contradiction between forecasting and planning. Griffith's (1980) observation of the Office of Federal Statistical Policy and Standards has provided an illustration of this epistemological contradiction between forecasting and planning. The Office opted for a strategy of "baseline projection" that did not attempt to take into account changes in intervention strategies by any level of government or by the private sector. This type of projection was used as a basis for forecasts, with the implicit assumption that the community would accommodate to whatever was forecast, and that planning action would not deter the attainment of the expected future, even if that future were undesirable. In other words, if planning is able to create a better future, the forecast will have been inaccurate. Paradoxically, therefore, a planning success may mean a forecasting failure.

C. Political Limits of Forecasting

Planning is an attempt to cope with uncertainty. Technically, uncertainty comes from the limits of extrapolation from the past, model manageability, and information insufficiency; epistemologically, it comes from the contradictions between the knowledge that aims at *knowing* what will be and the action that aims at *changing* what will be. A third source of uncertainty is politics. This includes uncertainty about the relevant planning environment in which actors hold various values and interests and uncertainty about decisions in other related decision-making areas. The conflicts among these various actors, values, interests, and decisions generate uncertainties. Politics is not only one of the fundamental reasons for the divergence between what is predicted to happen in *forecasts* and what actually happens, it also explains the divergence between what is anticipated to happen in *plans* and what actually happens. The following sections discuss two major political limits of forecasting. One is the political use of forecasts through biased assumptions; the other is the incoherence between the political prerequisites of plans and the existing political structure.

1. *Political Use of Forecasts*

No matter how hard forecasters have tried to improve the methods of forecasting, seemingly neutral and scientific forecasts are often politicized. For example, in his presentation of transit policy-making cases in the U.S., Martin Wachs (1985) argues that technical forecasts of transit patronage and cost are often guided by politics through a series of biased assumptions, at the expense of reliability. When local officials win or lose elections on the basis of their success or failure in garnering federal funds for favored projects, it is political value rather than technical objectivity that determines the forecast result of future travel demand and cost. Thus, political considerations are often embedded in the assumptions used in forecasts. On the demand side, the assumptions are usually that dramatic population growth will occur in the corridors to be served; the price of parking will double or triple in the near future in downtown areas; or bus routes which parallel new rail lines will be discontinued or rerouted to become feeders of the rail lines, resulting in the capture of their patronage by the rail service. These assumptions are not necessarily unreasonable each unto itself, but the conflicting interests behind them makes it rather difficult to bring about the desired combination of events. Local elected officials who lobby in Washington for capital grants on the basis of forecasted transit patronage and cost have no obligation or direct interest in supporting an increase in downtown parking prices to make them consistent with forecasts assuming higher parking charges. The assumption that bus service which parallels a new rail route will be eliminated is often challenged by bus patrons who seek the continuation of their service.

Another example of biased assumptions in forecasts and plans comes from the World Bank. According to S. Cole (1989), the Bank assumes that growth depends on the expansion and improvement of production facilities, and on the increased division of labor through international trade. This assumption leads to the Bank's assertion that in an interdependent world economy, growth in third-world countries is significantly affected by their connection with the world market and the performance of the industrial countries. Therefore, the forecasted performance of the policies to switch the allocation of resources from domestic welfare to export-oriented sectors and the forecasted effects of reduced government control and lower tariff protection are always overly optimistic. In some cases, the measures suggested (or enforced) by the Bank boost the economy for a while, but the economic future of the country is damaged in the long run.

2. *Incoherence Between Political Prerequisites of the Plan and the Existing Political Structure*

Planning is a political process. The prerequisite of effective planning, which is defined as the realization of goals and objectives without major distortion of the plan, is to have a political process into which the plans fit. One of the main reasons for the failure of forecasting and planning, then, is the incoherence between planning processes and the existing political structure in which forecasts and plans are prepared and implemented. Stephen Cohen, in his study of French planning, has elaborated this issue. As presented earlier, postwar French plans had two principal components. The first was the concentration of resources in a limited number of basic industries; the second was the general resource allocation plan. The first component operated on the basis of the so-called *economie concertee*: the exclusive partnership between the state and big business. The goal of the *economie concertee* was to manage rapid and orderly increases in output and productivity. This goal was rather narrow, as was participation. Since the focus of the plan was on strengthening the industrial core of large enterprises, there was no need to obtain the active cooperation of a wide range of groups. Such planning was consistent with the power structure of postwar France, which was mainly controlled by the managers of giant corporations, high-ranking civil servants, and national planners. While the state was intimately involved in the management of the dominant industries of the economy, mass politics was kept out. Such consistency between focussed planning and narrow political process has made this core-sector-centered plan rather effective.

The second component of French postwar plans—the projection of quantitative output targets in the form of a general equilibrium system—pushed them in the opposite direction, towards the center of politics, because this system had to embody all major decisions regarding resource allocation. The most important of these decisions concerned the public sector: the evolution of prices, taxes, interest rates, government spending, tariffs, wage levels, and so on. The government had to choose targets, outline programs, and implement them in a rather detailed fashion over a long period. Only if these decisions were carried through as planned would "market forces" steer the rest of the economy to the planned targets. Therefore, in order to be effective, such a coherent resource allocation plan had to be comprehensive in its targets and uniform in its implementation. This, in turn, necessitated the coordination of a wide array of political activities and the accommodation of a large number of powerful political and economic demands. These political prerequisites of the general resource allocation plan did not exist in the French political tradition.

In the framework of *economie concertee*, the interest groups (e.g., farmers, trade unions, and small businesses) which had long been excluded from the decision-making process did not believe that they could gain satisfaction through the plan. Therefore, they refused to take the plan seriously and continued to concentrate their energies on influencing short-term policies and programs. Their actions and the ensuing conflicts resulted in continuous pragmatic compromises in policy formation and execution. Almost all the decisions which had been previously written into the plan were not carried out—at least not without the kind of modification that distorted the plan. The actual pattern of sectoral development has therefore differed significantly from the planned pattern.

As the French case illustrates, the main political limits of forecasting are its use as a political tool through biased assumptions and the frequent incompatibility between the demands of the plan and the political context in which forecasting and planning occurs.

III. THE ALTERNATIVES

In this section, I will propose some ways of overcoming the technical, epistemological, and political limits of forecasting presented above. Technical alternatives falls into two categories: strategies which attempt to measure uncertainty in general and strategies which attempt to reduce uncertainty generated by the limits of model manageability and by data insufficiency. The epistemological alternative is to redefine the meaning of forecasting from static prediction into active anticipation. The political alternative focuses on participation. What is to be stressed is that these alternatives do not necessarily respond to the three major problems separately. Rather, they should be considered as three joint approaches designed to deal with the interwoven problems of forecasting.

A. Technical Alternative—Measuring and Reducing Uncertainties

1. *Measuring Uncertainty*

Instead of giving a single answer, some forecasters tend to offer several forecasts corresponding to different sets of assumptions; one forecast might be suggested as being "most likely" and others as "less likely, yet possible." The message to the users is that the forecaster is not certain about the right forecast but believes that the future development will be within a range of forecasts. This approach has the effect of setting up a confidence interval around a middle forecast. The question remains, however, of how to determine the confidence interval. Some forecasters have suggested using past errors to determine the distribution of future errors. However, past forecasts only measure the accuracy of a particular analyst's judgement in a specific historical context, while models, judgements, and historic context change over time.

2. Reducing Uncertainty

To solve the problem of crucial variables being left outside the model, the technical strategy for reducing uncertainties usually involves building bigger models and incorporating more variables. However, as Alonso (1968) has argued, in the process of building increasingly complex models the multiplicative nature of errors becomes an important factor to consider.

Another technical strategy to reduce uncertainties is to aggregate variables that involve many unpredictable elements, so that the uncertainty can be absorbed into the aggregated category. In other words, to make a rougher guess is a way to avoid major mistakes. For instance, in an open economy, imports and exports represent an important proportion of national product; changes in the international market are crucial to the domestic economy, but they cannot be controlled within the national framework of planning. Therefore, they increase uncertainty for planners. The response of postwar French planners to this problem was to adopt an aggregative approach. They analyzed the national economy in terms of a small number of key aggregated categories, such as prices, employment, foreign exchange, the allocation of national income among savings, consumption, and investment. By focusing on these aggregates, the items related to foreign trade, which create uncertainty, were absorbed into their respective aggregated categories.

However, such technical responses only partially suffice to rid forecasts of errors. Some variables remain exogenous and their future levels are difficult to predict. In addition, the inadequacy or unavailability of data make research on some fundamental relationships impossible. For instance, according to Isserman and McMillen (1982), the studies of the relationship between economic changes and migration in the U. S. are constrained because the U. S. has no reliable annual series of internal migration data. Yet this problem does not necessarily put into question the entire value of forecasts. As will be discussed in the next section, forecasts can be very useful if given a broader definition.

B. Epistemological Alternative—Redefining Forecasting as Active Anticipation

The epistemological limit of forecasting comes from its linear and narrow definition—that is, a prediction of what the future will be like without consideration of the impact of the actions that planning agents will take. Such a definition is contradictory to the concept of planning in which the objective is to take actions so as to affect the future. One solution to this problem is to broaden the notion of forecast "accuracy" and to redefine the role of forecasting in planning processes. There are three approaches which might lead to a broader notion of forecast

accuracy: to see forecasting as stimulation toward action as active anticipation, and as contextual understanding.

1. Forecasting as Stimulation to Action

The first approach is to see forecasts as tools to encourage discussions and to stimulate action. The forecast is a warning of what might happen and a call for action so as to bring about a more desired future (Isserman and Fisher 1984). For instance, the prospect of a continuing exodus of a community's young people may serve as a catalyst for community planning to stimulate jobs and stem the exodus. In this case, the forecast provides a resounding call of alarm to mobilize the community and the government. The role of planning here is to make certain that the forecast is erroneous. With successful planning, the forecast will be wrong, but it will have played the important role of warning the community of what could happen unless action were taken.

2. Forecasts as Active Anticipation

Along the same line, the second approach is to turn the dichotomy of forecasting and planning into a dynamic framework and perceive them as two inseparable activities. Each can be seen as the transition from one to the other. The forecast is the basis of action, and concurrently the process of planning helps form, test, and reshape the forecast. The future which occurs is a result of both the underlying forces and planning efforts. To be accurate, then, a forecast must anticipate both the nature and impact of planning action, part of which may be a response to the forecast. Given the dynamic relationship between forecasting and planning, prediction processes should include the anticipation of possible consequences of implementation and of other actions and their influences on future development. Planners should respond to such anticipation accordingly (Forester 1987).

In this approach to forecasting, planners do not simply foresee consequences or expect them passively. Rather, they are taking steps from the start to influence, alter, and shape what will happen. Moreover, the envisioning of future implementation situations and their consequences would be a basis for further arguments exploring implementation alternatives.

For example, consider a local urban redevelopment case in the U. S. recorded by John Forester (1987). A real estate developer proposes to tear down an existing warehouse and erect two office towers in its place. While reviewing the development proposal, the city planner does not simply try to predict project consequences. He envisions the developer's site in conjunction with the developing physical and socioeconomic context encompassing it. For example, the plans of other actors need to be taken into consideration: the government's plan for new highway

construction and another developer's plan to enlarge a nearby shopping center. The planner looks ahead to the possible outcomes of these plans (e.g., improved traffic conditions and bigger parking problems) in order to improve the developer's proposal in light of shifting environmental and economic conditions. Further, the planner places the proposal in institutional space and geographic space. He anticipates the concerns that other city departments and local communities are likely to have with issues such as taxes, traffic, air quality, water quality, and adjoining properties. So he acts beforehand to try to persuade the developer to address these concerns and to incorporate studies of these issues when the plans are to be submitted for review. The planner also addresses questions related to more informal factors. He organizes informal contacts between the developer and the departments which are not necessarily involved in the formal reviewing procedure in this case but have substantial influence over the final decisions (e.g., the Public Work Department) and with community leaders.

In short, instead of minimizing or ignoring external factors and pressures, the planner tries to deal with these sources of uncertainty: the planning environment and other actors and their concerns. Then he uses the planning process to resolve the possible conflicts and thereby reduce uncertainty.

3. Forecasting as Contextual Understanding

Another way of broadening the notion of forecast accuracy is to re-orient the focus of forecasting from a formal model to one that incorporates informal and non-technical elements as essential parts of the Task (Isserman 1984). Informal elements include knowledge about the place that is the object of the forecast—its industries and firms and their locational patterns, its resources and potential. By developing a good sense of the area's socioeconomic structure, forecasters are able to identify key factors in its future development, to estimate the possible impact of events in nearby areas, and so on. Being well-informed and being able to draw relationships between current events and an area's future are essential. In search of ideas and information, it is useful to skim material widely: official publications, national and local newspapers, and trade journals of industries important to the area, etc. It is also crucial to understand the theoretical literature on economic and demographic change well enough to be able to draw connections between anticipated events and their broader consequences. Planners and forecasters should meet constantly with government officials, bankers, merchants, business executives, community leaders, other planners, and other people whose actions are relevant to the area's future. Knowledge of other disciplines can also help in developing forecasting skills. For example, historians are experienced in combining many pieces of infor-

mation with broad contextual knowledge in trying to understand historical change and its determinants. Some of their ways of thinking, research methods, and perspectives can be useful in trying to predict change. Another informal element that could be incorporated in the forecasting is a consideration of policy options, insofar as there is a need to anticipate the impacts of alternative public policies. Even when the forecast model is not so sophisticated, the forecaster could outline the range of policy options and their likely impacts.

C. Political Alternative—Participation

The major political limits to forecasting come from the gap between the people who control the process of forecasting and the people who would be affected by the forecast and the ensuing plan. As the examples in Section II illustrated, forecasts are often used as tools to push for specific policies or to generate funds from which officials can derive political credit. Those people who are the objects of forecasting are simply left outside the process through which assumptions are determined and decisions made. Such a situation is particularly problematic when the forecast and plan attempt to cover a wide range of political and economic activities. In the case of the French resource-allocation plan, it appeared that the planned output targets were being significantly distorted because of the lack of general involvement and support (see Section II, Part C-2).

The rationale for broader participation is not merely a normative argument for democracy (although that argument is definitely crucial). Participation is also necessary for effective planning. With their immediate involvement in the situation at hand, those who would be affected by the plans might be able to identify problems that elude the planners. They might also anticipate some adverse consequences before any plan is put into action, thereby reducing harm and increasing chances for an effective solution.

In her comparison of urban renewal projects in the U. S. during the postwar period and in recent years, Karen Christensen illustrates how the involvement of neighborhood residents could have reduced possible conflicts and uncertainties and thus increase the likelihood of success. As a proposal to deal with postwar city deterioration, urban renewal was widely supported by Chambers of Commerce and city officials who were looking for a stronger tax base, developers who were looking for good sites, and even welfare advocates who were looking for improved living conditions. Nevertheless, after whole neighborhoods and thousands of housing units were destroyed in many cities nationwide, people began to protest the program "unexpectedly" and urban renewal programs became a major battleground in local politics. Today's evolved form of urban renewal—usually called neighborhood revitalization—involves

more citizen participation. Residents shape activities according to their own concerns and monitor these activities closely. These programs usually involve more rehabilitation and less clearance and have become increasingly small and cautious. These programs of neighborhood revitalization are still the focus of conflicts in the cities, but a wider participation has made the process more open and constructive. In particular, it has made it easier to anticipate conflicts and locate uncertainties, and thus to come up with more effective solutions.

The case of the French general resource-allocation plan, as illustrated before, also suggests the necessity of participation in reducing uncertainty and increasing effectiveness in planning. According to Cohen's analysis, the principal reasons for the failure of the resource allocation plan were political. Any comprehensive plan pulls a vast range of decisions into a single framework, makes explicit the implications of many contemplated programs, and presents those implications in the context of a blueprint for a society's future. Such general plans cannot be prepared and implemented by a small group of business and state officials. The range and importance of decisions that must be incorporated into the plan necessitate commitment from a wide range of political forces. Trade unions, local communities, small businesses, farmers, the military, the permanent bureaucracy, etc., must believe that they can realize their objectives through the plan. They must switch the focus of their efforts from the creation and execution of individual and pragmatically chosen programs and policies to the design and execution of the general plan. A political structure which is solely composed of state and big business managers does not provide room for broader participation. In such a framework, many interest groups are not involved in the planning process and they do not believe that their concerns are included in the general plan. Therefore, they keep their efforts concentrated on narrow and fragmented programs and do not participate in the implementation of the general resource-allocation plan.

The importance of participation in reducing uncertainties and making planning effective is also revealed in the case of community planning. As noted in the previous section on technical responses to forecasting problems (see Section II, Part A), forecasters usually prepare several forecasts corresponding to alternative sets of plausible assumptions. In the case of community planning, this approach is more valuable and educational than is a single attempt to come up with the right numbers. The emphasis here is not on a range of outcomes designed to encompass the "true" future, such as a confidence interval, but on a range designed to teach the community about what may lie before it under various assumptions. These underlying assumptions should be made explicit and become a part of planning discussions on community goals and strategies. The community, industry, and other actors would jointly

determine goals. The forecasted future conditions would then be compared to the goal conditions, and plans would be developed to attain the desired future state. Initial forecasts would indicate what is likely to happen in the absence of community action and, thus, indicate how much is needed to attain the goals. A community participating in such a planning process is likely to have goals related not just to the most traditional object of forecasting, i.e., population level, but also to quality of life—for example, unemployment rates, economic stability, orderly growth, and environment quality. In addition, an open discussion of the underlying assumptions of the forecasts would also reduce the possibility of political uses of the forecast (see Section II, Part C).

CONCLUSION

In this paper I have reviewed the major limits of forecasting and have proposed alternative methods in technical, epistemological, and political terms. My main argument has been that the problems of existing forecasting methods are mainly generated by the attempt to use pre-fixed and narrowly-defined forecasting models to apprehend the dynamic and complex social processes in which planning actions as well as socio-economic and political forces interact. Solutions to these problems can be found in establishing a more dynamic and broader framework of forecasting.

To a certain extent, such an approach to forecasting can be seen as a more comprehensive and sophisticated version of projection. As suggested in the beginning of this article, the difference between projection and forecast is that a projection is a conditional ("if, then") statement about the future, while a forecast is a statement on the most likely future. The proposed interaction between realities, projections, anticipation, and citizen participation can be seen as a way to lay the conditions for the use of projections in the context of social and political processes rather than in abstract models.

This alternative approach also requires some changes in the overall planning process. As presented in the introductory section, the relationship between planning and forecasting is dynamic. Forecasts can be self-fulfilling in some cases, but planning decisions will have ramifications for the future situation. If the forecasted future is undesirable, the objective of planning may be to prevent this "most likely" future from occurring. Such a relationship between forecasting and planning can be seen as problematic by some, but it also creates opportunities for those who hold a more dynamic view of forecasting and planning. The case of community planning discussed above (see Section III, Part C) shows that the forecaster improves the technique of forecasting by preparing several forecasts corresponding to alternative sets of plausible assumptions. The forecast is reoriented epistemologically: the initial

forecasts indicates what is likely to happen in the absence of community action and then indicates how much is needed to attain the goal. The forecast is used as a stimulator of action. To overcome political limitations, the planner invites broader participation from the community so that they can discuss the various assumptions and jointly determine their goals. Therefore, the new approach of forecasting is inseparable from constructing a planning process in which pre-fixed models and plans are replaced by dynamic interaction processes between various actors.

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