THE ROLE OF CONSTRAINTS IN POLICY ANALYSIS

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1. A Mathematical Analogy

It is hard to overestimate the methodological importance of the idea, so revolutionary when it was first conceived, of proving the unsolvability of certain problems, such as geometrical constructions by ruler and compass, and the determination of the roots of equations of degree five or higher, by means of rational operations and radicals. To this idea, we owe the great discoveries of Abel, Galois, Lindemann and the beginning of modern algebra and of group theory.

It is important to understand clearly the way in which the question was formulated. With regard to the solution of equations, the problem was not to determine whether an algebraic equation of arbitrary degree n has roots; this fact had already been established by Gauss in his doctoral dissertation (1799). The question that interested Ruffini and Abel was quite different, and concerned the means by which the solution was to be found.

Similarly, in order to decide which geometrical constructions are possible, it is first necessary to define sharply the meaning of the term “construction”, by specifying the instruments which are allowed in each case. Such questions could not be answered within the domain of elementary geometry; it was first necessary to translate geometrical operations into the algorithms of algebra and analysis.

This chapter of the history of mathematical thought contains a lesson of general methodological interest; a lesson which every policy analyst and decision maker should learn. Too often we take it for granted that any social problem can be solved, if sufficient resources are available. But the manageability of a social task cannot be rationally discussed until we have specified the acceptable means of collective action, as well as the limitations imposed by the availability of resources, knowledge, and organizational skills.

Thus, the analysis of a policy problem must start from the explicit recognition of the constraints. In the language of systems analysis, the
set of constraints specifies the boundary of the system under consideration; it is, therefore, equivalent to its definition. In spite of this fact, the literature of policy analysis and socioeconomic planning does not usually give to the systematic study of constraints an attention proportionate to its methodological importance.

The existence of constraints in any policy problem is, of course, readily admitted; but the number and types that are explicitly considered are generally very limited. It is not recognized with sufficient clarity that any theory or hypothesis relevant to a decision can actually be utilized only if it leads to a constraint, i.e., if it is expressed in "technological form" (Popper, 1959; 1960).

We are naturally inclined to conceive constraints only in a negative sense, as restrictions on our freedom of choice. Actually, when an important constraint has been identified, advantage can usually be taken of this knowledge. An organism can adapt just as the real world is constrained, and no more; learning and predicting are possible only when the environment shows constraint (Ashby, 1963).

It has been observed that social science, and especially economics, developed largely as the result of the critical investigation of successive utopian proposals, that is, of proposals of reform which disregard essential constraints (Hayek, 1933; Popper, 1960). Hence, while the recognition of objective limits to our ability to manipulate social institutions forms the very foundation of social technology, the theoretical explanation of those limits is the primary task of social science, and probably the most important stimulus to further progress.

This paper is devoted to a preliminary exploration of the role and use of constraints in policy analysis. We introduce a distinction between logical, empirical and policy constraints (defined below) which, without being exhaustive, can provide useful guidance in the analytic formulation of policy problems. The distinction also sheds some light on the respective role of deductive reasoning, empirical research, and "political" insights in policy evaluation.

As an indication of possible specific applications, we briefly examine some often debated issues concerning the methodology of economic and social planning, and the viability of these instruments of national policy.

In stressing the importance of an accurate knowledge of constraints, we do not mean to imply that all the relevant constraints can be known in every case. In policy problems such a complete knowledge is, of course, usually impossible. Strictly speaking, we can never be sure that our solutions are feasible, let alone optimal. Here lies the fundamental justification for the rationality of an incremental and evolutionary