

## TOPIC 12

### ALTERNATIVE PATTERNS OF DEVELOPMENT

Economic development is one of the principal challenges facing the world at this time. It is especially important in the developing countries which have limited means of solving various problems and of narrowing the gap between themselves and the developed world. In the past, previous experiences have been evaluated and development strategies devised, but most of these studies were based on purely economic factors. Recently, increasing attention has been directed to evaluating the significance of the non-economic factors of development (e.g., social, institutional, moral) and to incorporating them into development strategies. As a result, social and institutional changes have come to be considered equal in importance to the strictly economic factors affecting the process of development.

With the introduction of and concern for environmental issues and resource management problems, a new dimension has been added to the parameters of developmental strategy. Of special interest to our symposium is the fact that this new dimension requires and utilizes many new scientific and technical aspects of development and emphasizes the necessity for a more comprehensive interaction between social and natural scientists.

The Founex (1971) meeting underscored the complexity of developmental and environmental interaction. The solutions for certain problems of the environment may require a short-term deceleration of economic development, for instance, but greater attention to these issues now will contribute to long-term economic development and to greater social progress. In addition, the nature of the interaction between environment and development depends on a particular country's level of development. In the developed countries, for example, environmental problems have become acute as a result of careless development, and these problems have been accorded high priority. In the developing countries, on the other hand, economic growth is generally considered to be the major means of solving environmental problems (e.g., malnutrition, health, sanitation), although without proper management such growth can lead to undesirable environmental consequences, the depletion of natural resources, pollution, and problems of human settlements.

In most developing countries the overall objectives, concepts, and approaches of existing development strategies cannot be completely redesigned in the light of environmental considerations. But such considerations can have an important impact on specific aspects of these strategies and may lead to the elaboration of new and more rational solutions for some prob-

lems. An interesting and fruitful concept in this context is that of eco-development, the effort to find forms and methods of economic development that will take into account local resources and experiences most fully and rationally. In some cases, for example, environmental considerations might argue against importing products, production methods, and technologies which were beneficial in other areas but which are not suitable for another specific environment. Traditional resource uses and production methods (especially in agriculture) might be better retained than replaced by imported technologies. Each situation requires investigation and analysis before such decisions are made; existing concepts of industrialization, agricultural development, and other areas of development should be reviewed both from the point of view of adapting technologies and production methods to local conditions and of adapting local societies to the new tools. Of course, the major dimensions of the impact of environmental considerations on development can be appraised only through a multidisciplinary approach.

Up to now the major discussions of alternative development strategies have been confined generally to the social sciences. Most of these discussions propose options (more comprehensive than specific) and explore their most evident ramifications. The alternatives at the highest level of generality are considered to be between a socialist, centrally planned, development strategy and one based on private property and a market economy. More specific options in regard to development have been indicated (industrialization vs. agriculture; labor-intensive vs. capital-intensive; externally oriented development vs. self-reliance) which take into account territorial size and density, the level of economic development (per capita GNP, share of industry in total production, or degree of dependence on external relations), and other considerations. Although they are often presented as mutually exclusive, many of the alternatives coexist in transitional developing societies, and the predominance of one or the other is attained only gradually as a result of specific policies and trends.

The types of options formulated by natural scientists are usually related to narrower and more specific areas and are expressed in more technical terms, but they have explicit long-range consequences. In many cases, natural scientists have posed new problems or have provided new perspectives for old problems by introducing comprehensive and long-term speculations into developed strategies; this trend has been accentuated by the growing awareness of environmental issues (e.g., the danger of natural resource depletion, pollution, problems of rational land use, the future of human settlements). But natural scientists often overlook the socio-economic and cultural constraints which can jeopardize the implementation of environmentally beneficial proposals. In many cases, natural science studies must go hand in hand with socio-economic benchmark surveys.

The numerous areas in which natural and social scientists seek their options are closely interrelated in the development process; a choice made in one area may be incompatible with a solution proposed in another, and some solutions may be interconnected or even inseparable from others. In many



cases, however, there is a certain flexibility; so much so, in fact, that to describe all the alternative patterns of development (including environmental considerations) would require the description of a multitude of specific cases.

Some vital areas necessary for such a study have not yet been specifically analyzed. It therefore seems useful to shift the focus from the problems of alternative development patterns, inasmuch as they relate to environmental issues, to the impact that environmental issues have on existing development strategies and the criteria necessary for evaluating such an impact at the national and micro-economic levels. The major issue here is the scope, direction, and extent of the redefinition of development strategies (social objectives, conceptual framework, and institutional mechanisms) to include environmental considerations.

Of special importance to development proposals (e.g., eco-development) is the establishment of practicable and useful areas and degrees of applicability. Another significant aspect is whether existing institutions help or hinder the ability of society to cope with environmental problems and what socio-economic prerequisites (scale of values, institutions, etc.) are needed to integrate ecological measures into development strategies.

Another important requirement is the elaboration of criteria for the evaluation of environmental proposals in order to compare them with other aspects of development. This involves not only the assessment of long-range effects, but also the inclusion of values which cannot be satisfactorily estimated: in some cases, new factors must be included in evaluations (e.g., the non-renewability of certain resources); in others, important non-economic values must be introduced (the quality of life, the needs of future generations). A proper understanding of the problem and the determination of criteria for the evaluation of all these factors can be achieved only after intensive collaboration between natural and social scientists.

A two-pronged approach to these complex issues was proposed. The first approach was to begin developing a methodological basis for attacking these interdisciplinary problems. The usefulness of such a methodology was generally acknowledged, but doubts were expressed about whether or not it should be initiated without some preparatory work. It was decided that a committee of prominent natural and social scientists should be created to study the problems and pinpoint the major questions concerning methodology. The advisability of concentrating (in the first stages) on defining the main parameters needed to integrate environmental issues into development planning was acknowledged. At an appropriate stage, the devised methodology could be tested through case studies related to specific eco-regions. The potential value of mathematical models (embracing both economic and environmental considerations) as an appropriate conceptual framework within which to integrate the relevant disciplines was recognized.

The second approach was the initiation of specific studies of mutual interest to natural and social scientists. Among the topics proposed for special consideration were the following:

- (1) Dry and irrigation farming (especially in drought areas). The object in this area would be to discover where and under what conditions this form of farming is now economically, environmentally, and technically advantageous.
- (2) Land use problems. This area should be studied in light of the new relationships between foodstuffs, agricultural raw materials, and synthetics. The problem of world protein production and consumption was singled out as a special consideration in this area.
- (3) Rational technological and economic policies regarding energy. Under this heading, three groups of problems were mentioned: the prospects of unacceptable thermo-pollution as a consequence of an unlimited increase in the use of energy, and the measures required to counteract this effect; the environmental effects of various sources of energy; and a more energy-efficient strategy in human settlement policies (housing, transportation, etc.).
- (4) Extensive vs. intensive production methods.
- (5) Cities as specific eco-regions. The need for deeper studies on housing and town planning was stressed.
- (6) Equitable redistribution of world resources.

It was also stressed that mutual discussions between natural and social scientists could help to establish priorities for scientific research and to indicate those areas which might have the greatest impact on development.

In view of the complex interaction between natural and social scientists required by these problems, special consideration was given to the organizational aspects of multidisciplinary studies. Conventional group meetings and report exchanges were considered inadequate. Instead, it was proposed that working groups headed by scientists prominent in one field and supported by medium-level scientists from other fields be created; over the course of one or two years, each group could formulate a problem, prepare a draft study, send it to senior specialists in related fields for comment, and then finalize the new study. Another proposal was that questionnaires covering major problems should be prepared by scientists in one field and answered by scientists in another. The desirability of specialization in both natural and social sciences was also discussed as a long-term goal.