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USSR Report

ECONOMIC AFFAIRS

(FOUO 6/80)



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ECONOMIC POLICY, ORGANIZATION, AND MANAGEMENT

METHODOLOGY OF FORECASTING NATIONAL ECONOMIC DEVELOPMENT

Moscow VOPROSY EKONOMIKI in Russian No 1, Jan 80 pp 15-26

[Article by A. Anchishkin, corresponding member of the USSR Academy of Sciences: "Methodology of Forecasting of the Development of the National Economy"]

[Text] One of the elements of the system of managing and planning the socialist economy is the forecasting of the development of the national economy. In this system, forecasting performs an independent role as a form of comprehending and foreseeing objective processes of development of the national economy in concrete, quantitatively determined form. Forecasting is based on the progress the social and natural sciences have made in discovering the patterns of development of nature and society and on these sciences' perception of trends of socioeconomic and scientific-technical progress under the conditions of developed socialism.

The theory and practice of forecasting form in the process of improvement of the system of planning and development of economic theory and in its interrelationship with other fields of scientific knowledge. There are systematic medium-range and long-range forecasts of development of the national economy and its individual branches and scientific-technical and demographic forecasts. On the whole it is obviously still too early to speak of forecasting as an existing system. However, analysis of existing experience makes it possible to formulate certain methodological problems of the further development of this sphere of scientific and practical activity.

As a component part of the socialist planning system, forecasting together with its functions and in some measure with its subject, which consists in identifying and predicting objective trends in the development of the national economy, occupies a special place in the system. Not all objective processes are amenable to planning. This depends both on the nature of the processes proper and on the level of development of the planning system. For example, notwithstanding the fact that demographic processes are amenable to planned influence, they cannot be the direct object of social planning. The population's current demand for consumer goods, even though it can be

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regulated under the influence of planning in the realm of production, incomes, and prices, is primarily occasioned by unplanned consumer behavior. The development of foreign economic relations depends inter alia on the state of the world capitalist market. Consequently, there are various types of objective processes that can and should be forecast but that cannot be viewed as the object of direct planned management.

The degree to which planning encompasses processes in the national economy also depends on the level of development of the planning system proper. The formation of the planning system is not a one-time act but is the process of expansion of the sphere of planned elements of social development. Thus, only in the stage of mature socialism does social and scientific-technical development fully become the object of planning. At the same time, there is continuous change in actual conditions. This change finds reflection in the improvement of the system of management and planning after a certain lapse of time. For example, ecological processes acquire special urgency given a certain level of development of the productive forces, which determines the objective need for their planning. The same can be said regarding urbanization and certain other objective processes. The expansion of the planning sphere in the given directions will obviously be inevitable in the future as well. But even given the absence or insufficient development of individual parts of the planning system, it is possible to forecast the various processes; moreover, the advent of these directions of forecasting is a necessary condition to the formation of new elements of planning.

In addition to the noncoincidence of the subject matter, differences between forecasting and planning underlie the differences in their functions. The essence of these differences is that planning is the process of making and implementing planning decisions, whereas the goal of forecasting is to form the scientific prerequisites for making these decisions. The following can be listed among these prerequisites and among the functions of forecasting: the quantitative and qualitative analysis of trends in the development of the national economy, of existing problems and of new phenomena; the probabilistic, alternate prediction of the future development of the national economy which takes into account both existing trends and the goals that are set; the evaluation of the possibilities and consequences of exerting an active influence on predictable processes and trends; and the substantiation of the main directions of socioeconomic and scientific-technical policy.

Based on the results of forecasting, planning in the narrow sense of the word as the economic decision-making process consists first and foremost in the planned distribution of limited resources and the creation of economic conditions for the realization of the given plan targets. The unity of forecasting and planning consists in the fact that forecasting is a necessary prerequisite to scientifically substantiated planning and is an integral element of such planning. The plan and the forecast are not two alternate approaches to determining the perspectives of socioeconomic and scientific-technical development but are complementary stages in the development of national economic plans given the unconditionally decisive role of the plan as the principal instrument in managing the socialist economy and in implementing the party's economic strategy.

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Taking the general differences of the subject and functions of planning and forecasting into account, we can formulate some of their concrete features. They consist first of all in the fact that the system of plan indicators must correspond to the demands of management, to the need to make directive-type, address-type planning decisions whereas the forecast -- even though it must consider the tasks of management -- is for the most part structurally determined by the content of the forecast processes. In other words, the planned indicators must maximally correspond to the structure and requirements of management while the forecast indicators must correspond to the demands of cognition of objective processes. At the same time, it is necessary to secure the transition from forecast indicators to planned indicators. Second, the directive nature of planning presupposes its address nature whereas forecasting cannot correspond to the existing organizational structure of the economy and does not have a specific administrative address. Third, the plan differs from the forecast by virtue of its significantly greater determinacy. The very nature of planning is determined by the striving for the determinacy of future development, for overcoming the objectively extant probabilistic character of development of the national economy. The forecast, on the other hand, is based on probabilistic prediction. Fourth, while the development of the plan means the development of different variants of the plan, the plan proper is the already selected variant of development which is slated for practical implementation. The forecast, on the other hand, is a variant and an alternative not only as the technique of preparation but also as the end result.

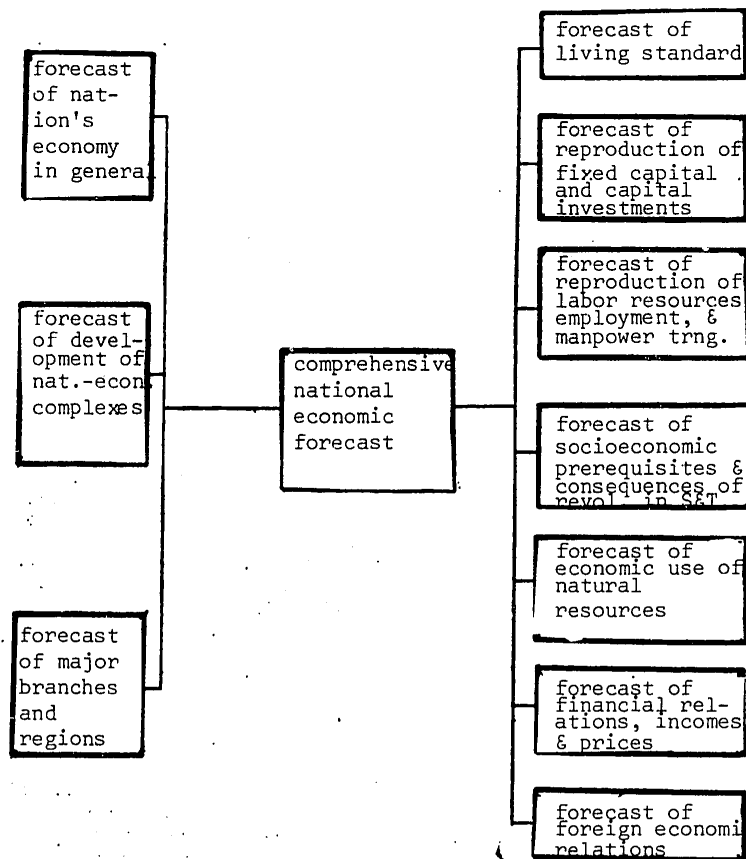
Thus, as part of the planning system forecasting performs its own specific functions within this system: the probabilistic, variant (alternative) prediction of the future on the basis of the concrete identification and measurement of objective patterns of socioeconomic and scientific-technical development.

As we examine the place of forecasting in the general planning system, we should note the particular role of long-range forecasts and their relationship with the comprehensive 20-year program for scientific-technical progress, with the basic directions of economic and social development for a 10-year period, and with special-purpose programs. The decree of the CPSU Central Committee and the USSR Council of Ministers "On the Improvement of Planning and Increasing the Influence of the Economic Mechanism on Enhancing Production Efficiency and the Quality of Work" notes that these elaborations are part of the unified long-range planning system. Calculations for the extended future obviously include the compilation of appropriate partial and comprehensive forecasts to ensure that full consideration be given to predictable patterns of scientific-technical and socioeconomic development. In particular, the comprehensive 20-year program of scientific-technical progress, which is oriented toward the substantiation of the main elements, results and techniques of implementation of a unified technical policy, must incorporate the entire wealth of information that is supplied by the numerous scientific-technical and socioeconomic forecasts made in our country.

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The forecasting of the development of the national economy is comprehensive: it encompasses all aspects and levels of development of the national economy; it is interconnected with social, demographic, and scientific-technical forecasting, with the forecasting of natural resource utilization and of the development of international relations. Each of the indicated directions has independent significance and can in some measure be elaborated independent of other directions; the same can also be said of some more particular problems that are of a branch and regional character. In the analysis of methodological problems involved in the comprehensive forecasting of the development of the national economy, all basic directions and aspects of forecasting must be examined in their unity.



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The structure of the national economic forecast (see chart on preceding page) includes both various levels of aggregation of the national economy and various aspects of its development. With regard to levels of aggregation in the national economic forecast, we can single out macroeconomic and structural (interregional, intraregional) forecasts, forecasts of development of national economic complexes (fuel-energy, agro-industrial, investment, and production infrastructure, consumer service sphere) and forecasts of major branches and regions.

In accordance with various aspects of reproduction, we can single out forecasts of: the living standard, employment and labor inputs, the reproduction of fixed capital and capital investment, the economic use of natural resources, socioeconomic prerequisites and consequences of scientific-technical progress, and foreign economic relations. These divisions of the national economic forecast have their own content, are coordinated with one another, and operate in unity in national economic forecasting on the whole.

The sequence of forecasts of the development of the national economy depends on the forecasting horizon, the basic conditions of economic development, and the concrete tasks of national economic forecasting. On the whole, the compilation of a comprehensive forecast of the development of the national economy is iterative; however it contains a number of counter-directions which must ultimately be coordinated within the framework of a unified comprehensive forecast. For example, the national economic forecast can be made starting with general (macroeconomic) indicators of economic development and ending with indicators of the structure of production and development of individual interbranch complexes and branches and simultaneously starting with production and structural constraints in the development of material production, its branches and facilities producing individual types of products and ending with general indicators of reproduction. On the other hand, it is possible to proceed from socioeconomic tasks to the forecast of production resources and their effectiveness and simultaneously from the forecast of production resources to the forecast of the solution of socioeconomic tasks.

It is specifically such a two-way process of comprehensive forecasting of the development of the national economy that makes it possible to identify both the main sources and basic problems of further development. In particular, the elaboration of the Comprehensive Program of Scientific-Technical Progress and Its Socioeconomic Consequences in the Long Run showed that the principal long-range directions of development of science and technology can be substantiated on the basis of two counter-approaches -- the identification of existing trends of scientific-technical progress and the results of their incorporation in the national economy and, simultaneously, the determination of objective demands on the directions and rates of scientific-technical progress stemming from the need to resolve the principal long-range tasks of development of the national economy. As a result of the interaction of these counter-approaches, it is possible to substantiate the need for fundamentally new technical solutions and to effect the appropriate redistribution of scientific-technical resources.

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The coordination of individual divisions and aspects of the national economic forecast is carried out for variants in accordance with which each alternative approach to the development of the national economy must be characterized by a system of coordinated forecasting indicators. The basic difficulty in such coordination consists in determining for each alternative indicators conforming to the nature of a given alternative. It is especially important to make this determination in the case of the intensification of production and in improving the quality of goods and services. These conditions amplify the multidirectionality of economic indicators corresponding to one and the same alternative in the development of the national economy. The reference is to indicators characterizing the dynamics of the volume of production resources and the effectiveness of their use, the growth of output, the improvement of product quality, change in the scale of production, and structural modifications.

The structure of the national economic forecast is also associated with forecasting horizons. It is conditionally possible to single out the short-range forecast (up to 2-3 years), the medium-range forecast (up to 5-7 years), and long-range forecasts (up to 15-20 years). The content of forecasts with different time horizons is determined by the nature of the forecast processes. The greater the stability of forecast processes and trends, the wider the forecasting horizon can be. The various reproductive processes have different rates and different time cycles. Thus, the reproduction of fixed capital is determined by service life while the reproduction of labor resources is determined by the duration of demographic processes and the time it takes to train personnel; the time of renovation of machine building products is determined by the dynamics of the technical level of the implements of labor, etc. Therefore there are different time horizons of forecasting for various aspects of development of the national economy and for the content of forecasts of varying duration.

The forecast of the course of fulfillment of one-year and five-year plans, of current national economic processes associated with the movement of financial flows and prices, with changes in the structure of the effective demand of the population, with the influence of fluctuations in agricultural production on economic development, etc., is most in keeping with the nature of the long-range forecast. Medium-range forecasting consists first and foremost in the forecasting of the rates, factors and structure of economic development, and in the forecasting of investment processes.* The long-range forecast must above all take into account the aspects of national economic development that are associated with demographic processes, with the fundamental solution of large-scale social tasks, with scientific-technical progress, and with the utilization of natural resources.

*The investment cycle (from the investment decision to the activation of new capacities), which on the average runs 5-8 years, is the principal material factor in forming the rates and proportions of economic development and thereby determines the basic content of the medium-range forecast.

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The realization of forecasting principles ensures the methodological unity of various techniques and models of comprehensive forecasting of national economic development and its component parts. The isolation of individual forecasting principles does not mean that they exist independently of one another and that they can be used selectively. At the same time that they reflect various aspects of scientifically substantiated forecasts, these principles must be viewed as a single whole.

Marxist-Leninist economic theory is the general theoretical basis of forecasting of the development of the national economy. The objectiveness and cognizability of economic development serve as the theoretical basis of forecasting. Understanding of the objective character and at the same time the cognizability of the laws of economic development determine the basic content of forecasting: the qualitative and quantitative analysis of actual economic processes and the identification of the objective conditions, factors and trends in development. Marxist-Leninist theory of expanded reproduction is of paramount importance in the forecasting of national economic development. At the same time that it encompasses all basic elements of reproduction of the productive forces and production relations, the rates and factors of economic growth, and the criterion and mechanism of proportional, balanced economic development the theory of reproduction creates the methodological basis for the formulation of concrete principles of national economic forecasting.

The systems principle of forecasting means on the one hand that the national economy is viewed as a single object and on the other hand that it is viewed as an aggregate of relatively independent directions (blocks) of forecasting. The practical compilation of comprehensive forecasts on the basis of the systems principle presupposes the creation of techniques and models that would correspond to the content of each individual block and would simultaneously make it possible to construct a whole picture of potential development of the national economy. The realization of such requirements is associated with considerable difficulty with regard to method. Wholeness necessitates the standardization of models, information, and computational methods whereas the specifics of individual economic objects can be adequately expressed only if they maximally approximate individual forecasting blocks. The first demand is in line with the striving to construct a single "super-model" of forecasting, which inevitably leads to the creation of an externally rigid construction, to the impoverishment of the content of forecast economic processes, the second demand can be realized only with the elaboration of a system of particular techniques and models, which complicates the construction of a single and internally consistent forecast.

In order to realize the systems principle while maintaining the priority of economic content, it is expedient to use the "block" method of comprehensive forecasting. This requires the establishment of exogenous indicators for the entire forecast of the national economy as a whole, the determination of the sequence of forecasting calculations, the determination of input and output indicators (for each block) corresponding to this sequence, and the sequence of iterative adjustment of intermediate results.

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The principle of equivalence of the forecast to objective patterns. The realization of this principle presupposes the identification and quantitative measurement of stable trends and interrelations in the development of the national economy above all and accordingly the creation of a theoretical analog of actual economic processes. The sufficiently complete and precise simulation of these processes is the main condition to the scientific validity of the forecasts. Here the theoretical model of the analysis and forecasting of the development of the national economy refers to a practically realized model which is the form of scientific depiction of reality.

The given principle presupposes consideration of the probabilistic, stochastic character of actual processes. This necessitates the evaluation of existing and possible deviations from dominant trends and the determination of possible areas of their divergence, i. e., the evaluation of the probability of realization of the elicited trend. As the forecast period increases, the scatter area increases and ultimately the magnitude of possible area may be comparable with the magnitude of the forecasting indicator which contradicts the equivalence principle and compels us to abandon the compilation of such a forecast. The raising of the level of aggregation of forecasting processes and the search for longer developmental trends improve the quality of the forecasts.

The use of the given principle in the elaboration of forecasts presupposes the testing of forecasting techniques and models from the standpoint of their ability to simulate the already existing trends. Before these techniques and models can be the instrument of prediction, they must become the instrument of cognition. The given demand must be performed solely on the basis of numerous experimental calculations that ensure the continuous correspondence of theoretical principles, the system of indicators, mathematical models, basic data, and computational techniques to the content of analyzed processes.

When the transition is made from the simulation of existing processes and trends to the prediction of their future development, it becomes necessary to construct alternatives, i. e., to specify possible avenues of national economic development. Alternative forecasting is associated with the possible development of the national economy and its individual elements for various trajectories, in different interrelations and in structural correlations. The probabilistic character of forecasting reflects the existence of random processes and deviations in the face of qualitative homogeneity and the stability of forecast trends; the alternative principle, on the other hand, is based on the assumption of the possibility of qualitatively different variants of economic development.

The principal task of practical realization of this principle consists in separating variants of development from variants that cannot be realized under existing and foreseeable conditions. This presupposes the differentiation of individual alternatives (variants) in terms of the probability of their practical realization. Among all variants, the one with the greatest probability of realization is usually the extrapolation variant since it

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stems from the preservation of existing stable conditions and trends. However, this does not mean that the extrapolation variant is preferable. In order to overcome certain existing trends, it is essential to use non-extrapolation alternatives substantiated from the standpoint of proportionality, resources and their effectiveness, the possibility of resolving the problems that arise, etc. The realization of non-extrapolation alternatives requires the application of purposeful influences the intensiveness of which must be all the more powerful in proportion to the degree that the given alternative diverges from the extrapolation alternative.

The basic technique used to determine the practicability of individual alternatives of development of the national economy is to verify their proportionality in all basic aspects. At the same time, it is essential to take into account the real constraints (resource constraints, structural constraints, constraints based on indicators of effectiveness) within whose framework proportional alternatives of economic development must be elaborated.

Bottlenecks and focal points of imbalance may be elicited in the process of national economic forecasting. Without dwelling on the origin of such elements of imbalance, we should note their constructive function. The disparity between certain elements of projected national economic development* reflects objective nonantagonistic contradictions that are possible for a given variant of development. Such disparities and "discontinuity points" advance certain problems that are dynamic factors. The solution of these problems creates the objective need for qualitative change in the structure and effectiveness of production resources, for the search for fundamentally new technical solutions, and for improvement in the economic mechanism.

Each alternative approach to the development of the national economy has its own aggregate of problems that are difficult to solve in the face of existing trends. It may be that one or another alternative does not as yet have a balanced solution. In such a case, it is essential to determine additional conditions** the fulfillment of which will make it possible to realize a given alternative. The degree to which these conditions are practicable may ultimately be determined only after the elaboration of the plan proper. However, in any case the scale, time limits and results of solution of the corresponding problems must be determined within the framework of the forecast.

*If this disparity is not merely the result of the low level of balance sheet calculations.

**Such conditions cannot be determined from the standpoint of formal proportionality. For example, interbranch forecasts that proceed from the autonomy of the final social product and the gross social product cannot reveal the actual conditions of balanced development. This requires consideration of resource constraints, the possibility of restructuring the economy, and foreseeable changes in indicators of the effectiveness of production.

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Potential quantitative change in the conditions of reproduction, e. g., when the transition is made from primarily extensive to primarily intensive methods of expanded reproduction are above all the source of alternative national economic development. Assumptions regarding its concrete purposes influence the formation of development alternatives. These goals are determined by existing patterns of development of social requirements and by the need to resolve concrete national economic problems. The alternative principle thereby reacts with the purposefulness principle of forecasting.

The transition from existing trends to trends that maximally correspond to the goals of long-range development determines the active character of socialist economic forecasting. The national economic forecast and its component parts are structured with regard to the elements, individual parameters and variables through which a controlling influence can be exerted on the course of economic development. Of course, it is hardly possible, e. g., to envisage the direct regulation of the output-capital ratio. However, through the modification of the economic mechanism (rent payments), technologies and the organization of production it is possible to substantiate actual possibilities for influencing the output-capital ratio too. The active character of forecasting also presupposes the evaluation of the interaction of the intensiveness of the controlling influence and its results. The more significant the deviation of the substantiated alternative from the extrapolation alternative, the more intensive must be the corresponding influence expressed first and foremost in expenditures of resources and in changes in the economic mechanism.

The aforementioned national economic forecasting principles, which strike us as the main even if not the only principles, underlie the system of concrete forecasting techniques and models. The diversity of the existing techniques and models of forecasting is determined by the particulars of individual processes in the national economy, by the availability of information, by the potential of computer technology, by existing practical knowhow, and by other circumstances. Considering this diversity in forecasting, it is possible to single out two universal approaches -- genetic and special -- which combine more particular techniques and models.

The genetic approach reflects the existence of stable trends in the forecasting process that impart an inertial character to the development of the national economy in some degree. Any foreseeable phenomenon or process has its sources in the present and in the past. No matter how the future state differs from the present and the past, it is always associated with them; it forms from already known elements albeit in other correlations, in a system of new relationships.

The normative (goal - oriented) approach characterizes another aspect of forecasting processes already noted above -- their controllable nature, their dependence on the objectives of development of socialist society. The goal may be fixed in the form of some normative state (level of attainment of the goal and structure of the forecast object) and in the form of the desirable trajectory of the transition from the existing state to the normative state.

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The genetic and goal-oriented approaches complement one another since future national economic processes are conditioned both by already existing relations and trends and by projected social goals and requirements. What is more, the goal-oriented approach can be scientifically substantiated only to the degree that it corresponds to the actual potential of deliberate regulation of objective processes. At the same time, the genetic approach does not incorporate all the prerequisites required for the construction of a scientifically substantiated forecast since the development of socialist society is of a controlled character. In any event, a purely genetic or purely goal-oriented approach is impossible.

The correlation between genetic and goal-oriented approaches changes depending on the period and object of forecasting. When the forecasting period is longer, there is less relationship between resources in the already existing structure of the national economy and planning decisions; this increases the possibility of distributing resources in accordance with the goals of future development and the sphere of utilization of the goal-oriented approach is expanded. With a shorter forecasting period, there is a closer relationship with regard to resources, there is less opportunity to use the goal-oriented approach, and the sphere for applying genetic forecasting techniques is expanded.

The correlation between the genetic and goal-oriented approaches also depends on the specifics of the object of forecasting. As already noted, there are various objective possibilities for the planned regulation of individual aspects of socioeconomic development (demographic processes, for example, are less amenable to regulation than the dynamics and structure of production). The higher the degree of controllability of the forecast processes, the greater the degree of applicability of goal-oriented methods. The potentialities of the genetic approach are correspondingly greater when the forecast processes are relatively less controllable.

Since the forecasting of the development of the socialist economy is a stage in the compilation of the plan, the correlation between the genetic and goal-oriented approaches must also be viewed from these positions. Genetic methods are designed to direct work on the plan into the channel of actual trends and potentialities while goal-oriented methods are intended to substantiate the transition from existing trends to socially necessary trends. Forecasts must thereby maximally promote the elaboration of practicable and purposeful plans. In this regard, it must be noted that economic forecasting methods in capitalist countries are primarily genetic. The reason is that capitalism lacks state planning and hence there is no clearly pronounced need for a goal-oriented approach based on social interests.

The genetic approach is realized primarily through a system of econometric mathematical-economic models. Econometric models are based on statistical data relating to the past and on expert assessments of individual variables and their parameters which are included in the models. Without dwelling on the concrete form of such models and the methods used in their construction, we can single out two types of these models -- factor and structural models -- which can also be combined to form factor-structural models. At the same

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time, one and the same type of model can be applied to economic objects at various levels of aggregation of indicators of the national economy (macro-economic, interbranch, interregional, branch, and regional), and to the forecasting of various aspects of development of the national economy (the reproduction of fixed capital and labor resources, finances and prices, the population's consumption).

Econometric models are the main but not the sole form of realization of the genetic approach since the possibilities for quantitative measurement in the analysis and forecasting of socioeconomic processes are very limited. These limitations are associated not only with the existence of statistical information, computational methods, and technical means but also with the very nature of national economic processes that can by no means always be expressed in quantitative form. For example, the motives for labor activity (the level and form of wages, moral incentives, etc.) influence the level and dynamics of labor productivity, but it is very difficult to measure this influence in quantitative terms. At the same time, only the processes and phenomena that can be measured are considered in the forecasting process. Hence the need arises to use expert methods, i. e., methods based on the collection and processing of quantitative and qualitative evaluations by individual scientists and specialists. Such methods, which are for the most part used in scientific-technical forecasts, can be viewed as universal forecasting methods. Essentially, they are genetic methods: here objective patterns and trends are analyzed and forecast through their reflection in the process of scientific cognition.

Expert methods as species of heuristic methods make it possible to reflect in forecasts processes that are still in the embryonic state and to take into account possible changes in conditions of development and in trends that cannot be measured by any existing quantitative methods. A particularly significant role can be played by the application of expert methods in long-range forecasting since here the potential of econometric models becomes minimal. Expert methods make it possible to introduce into long-range forecasting assumptions on qualitative change in the trends of scientific-technical and socioeconomic development for which there can be no direct econometric substantiation.

Goal-oriented forecasting methods play an important part even though they are developed to a significantly lesser extent than genetic and especially econometric methods. The essence of these methods consists in the identification of patterns of development of social goals, needs, and the normative state in which these goals can be attained in a certain hierarchy corresponding to the hierarchy of social goals and requirements. The development and introduction of goal-oriented forecasting methods presuppose the creation of the theory of development of social needs and methods for measuring these needs. Since the goals of development can also be formed on the basis of the need to resolve large national economic problems, the methods of goal-oriented forecasting must ensure the identification of these problems and the elaboration of alternate solutions to them.

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The main socioeconomic goals of long-range development elaborated by the CPSU with regard to the features of a specific stage of social development are the basis of goal-oriented forecasting. The use of these goals as the point of departure in a forecast presupposes their expression in a system of measurable social norms characterizing certain qualitative stages in the attainment of the goal. The social norm is designed to reflect existing social ideas regarding the level of realization of a concrete social task which ensures the transition to a qualitatively higher degree of satisfaction of social requirements. For example, the solution of the housing problem in the existing view means the attainment of a certain per capital housing with a high level of amenities and a rational system of settlement. Social norms cannot be regarded as the result of speculative, subjectivistic constructs. They must reflect the actual level and dynamics of social needs that can be satisfied in the forecast period in accordance with the actual potentialities for the development of material production.

The goal-oriented forecast, which is based on the main social goals and norms, is designed to construct the hierarchy of social needs in the form of a tree of goals or another hierarchical structure. In this system of goals, complementary needs may originate side by side with substitutable needs. For example, the rationalization of the structure of the population's current consumption may include the search not only for the optimum correlation of the consumption of food, outer garments and footwear, but also for the optimum correlation between individual substitutable foodstuffs that can satisfy one and the same need (for example, the need for fats). The construction of a rational consumption budget widely used in the elaboration of long-range forecasts is the most highly developed method used in the goal-oriented forecasting of the system of social needs.

Goal-oriented forecasting methods in combination with genetic methods are intended to identify long-range problems whose solution is a necessary condition to attaining given goals on the basis of the balanced and effective development of the entire economy and its various parts. The problem proper and the scale of the problem can be ascertained by analyzing the disparity between the normative state stemming from the forecast of social needs and dominant trends. The greater this disparity, the more considerable the problem and the more difficult the avenues to its solution. Thus, comparison of the avenues to the solution of the food problem with trends toward higher effectiveness of agricultural production indicates the need for the substantial acceleration of its growth rates, for raising labor productivity, for increasing the yield of agricultural crops, for increasing the productivity of animal husbandry, etc.

The forecast of resources and their effectiveness in the construction of a goal-oriented forecast is a derivative forecast designed to substantiate the possibility of overcoming the disparity between the normative (desired) state and the dominant trend. In a number of cases, the elimination of this disparity requires change in the given trends. This in turn requires the revision of the scale and structure of resource distribution, the substantiation of fundamentally different trends in the realm of their effective use, the adjustment of goals and normative states (both in terms of level and

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time of attainment). All the indicated ways of coordinating goals and trends of development can be substantiated simultaneously. At the same time, the more considerable the deviation of the trajectory of transition from the existing state to the normative state, the greater must be the change in the distribution of resources and their effectiveness and in the technical level and organization of production. From this it follows that in normative methods the forecast of goals precedes the forecast of resources.

The goal-oriented forecast must ultimately be coordinated with the genetic forecast. This presupposes the development of a genetic forecast from the closer to the more distant future and the development of the goal-oriented forecast in the reverse temporal direction. The adjustment of forecasts of reserves, their effectiveness, goals, and social requirements makes it possible to attain the gradual coincidence of the trajectories of genetic and goal-oriented forecasts.

Forecasting methods based both on quantitative measurements and on qualitative evaluations help to reveal objective patterns of socioeconomic development and thus strengthen the scientific basis of socialist planning.

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ECONOMIC POLICY, ORGANIZATION, AND MANAGEMENT

NET OUTPUT INDICATORS DISCUSSED IN DETAIL

Moscow VOPROSY EKONOMIKI in Russian No 12, Dec 79 pp 12-23

[Article by R. Gavrilov: "Normative Net Output in the System of Economic Indicators of the Enterprise"]

[Text] The economic cost-accounting indicators that measure results against input and resources are of great importance for the efficient functioning of the economic mechanism. In the summary report delivered at the 25th Party Congress, L.I. Brezhnev pointed out that "it is necessary to improve the whole system of indicators underlying the evaluation of the operations of ministries, associations and enterprises. These indicators are supposed to bring together the interests of the worker and those of the enterprise, the interests of the enterprise and those of the state, helping to formulate (and of course fulfill) stepped-up plans, to economize on resources and to reduce production costs ..."

A constructive solution to this problem is provided by the Decree of the CPSU Central Committee and the USSR Council of Ministers, which is entitled: "On the Improvement of Planning and the Intensification of the Effect of the Economic Mechanism on Increasing the Efficiency of Production and the Quality of Work." The Decree stipulates that beginning in 1980 the five-year and annual plans of the ministries, associations and enterprises specify targets concerning the growth of (normative) net output and the increase in labor productivity--calculated on the basis of normative net output--and a fixed standard of wages per ruble of normative net output.

Thus in the large and complex system of cost-accounting indicators, there is a transition from gross indices (gross output, gross turnover, tonnage, estimated cost) to indicators free from multiple accounting of capital goods input.

The System of Cost-Accounting Indicators

Table 1 shows a list of physical production indicators measuring the results of economic operations against the diverse quantities of input and resources. The table is set up as follows. The rows show the results of

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economic operations: Gross output ($c_1 + v + m$), net output ($v + m$) and profit (m). The columns show input and resources: Living labor (v), total input of living and embodied labor ($c_1 + v$) and the calculation of resources ($c + v$). Thus the table contains nine groups of indicators. Groups 1, 2 and 3 reflect the productivity of living labor; groups 4, 5 and 6 reflect labor efficiency, and groups 7, 8 and 9, resource yield. Each group has its economic character, its practical purpose and consequently, its advantages and shortcomings in accordance with the time, conditions and place of application. In our view, the opinion that in this large system there must be a "universal" indicator is incorrect, since each of them was created for specific objectives and since each functions well at the concrete developmental stage of the national economy, in the individual sector, subsector, and enterprise. Thus group 6 contains the indicators of type $\frac{m}{c_1 + v}$ that represent the profit-production cost ratio which before the economic reform was calculated as a whole for the enterprise, but which presently is used in fixing the prices of individual articles. Group 2 contains the indicators of type $\frac{v + m}{v}$ which represent the economic elaboration of net output per worker and per unit of time. Beginning in the 11th Five-Year Plan, this group of indicators becomes directive and is used side by side with the indicators of Group 1.

Table 1. The System of the Enterprise's Cost-Accounting Indicators Comparing Results, Input and Resources

1) Результаты 5) Затраты и ресурсы	2) Полная продукция: валовая, товарная, реализованная, валовой оборот (в руб., часах, натуре) $c_1 + v + m$	3) Фактическая, условная, нормативная чистая продукция (в руб., натуре) $v + m$	4) Прибыль балансовая, расчетная и др. m
6) Живой труд: часы, чел.-часы фактические и нормативные. Работники и рабочие, списочные и ищущие. Фонд оплаты труда v	7) 1 Производительность труда, выработка на работника, рабочего (в час, чел.-час.) $\frac{c_1 + v + m}{v}$	8) 2 Производительность труда, выработка чистой продукции на работника (в час.) $\frac{v + m}{v}$	9) 3 Норма приращенного продукта, прибыли на работника $\frac{m}{v}$
10) Варианты полных затрат живого и прошлого труда: себестоимость, 11) $c_1 + EK$ (в руб.) $c_1 + EK + A$ (в руб.) ($c_1 + v$)	12) 4 Эффективность труда через валовую продукцию $\frac{c_1 + v + m}{c_1 + v}$	13) 5 Эффективность труда через чистую продукцию $\frac{v + m}{c_1 + v}$	14) 6 Рентабельность к себестоимости $\frac{m}{c_1 + v}$
15) Оценки ресурсов: 16) $c_{обл} + c_{ов} + v$ (в руб.) $c_s + c_{об} + K_v$ (в руб.) и др. $c + v$	17) 7 Ресурсоотдача через полную продукцию $\frac{c_1 + v + m}{c + v}$	18) 8 Ресурсоотдача через чистую продукцию $\frac{v + m}{c + v}$	19) 9 Рентабельность к ресурсам $\frac{m}{c + v}$

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Key:

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|--|--|
| 1. Results | 10. Variants of total input of living and embodied labor: Production costs |
| 2. Total production: Gross, commodity, sales, gross turnover (in rubles, hours, kind) | 11. In rubles |
| 3. Actual, standard, normative net output (in rubles, kind) | 12. Labor efficiency over gross output |
| 4. Profit: Balance-sheet, accounting and others | 13. Labor efficiency over net output |
| 5. Input and resources | 14. Profitability-production cost ratio |
| 6. Living labor: Hours, man-hours--actual and normative. Workers and employees--staff and temporary. Wage fund | 15. Calculation of resources |
| 7. Labor productivity, to output per worker, employee (in hours, man-hours) | 16. $c_{basic} + c_{aggr.} + v$ (in rubl.) |
| 8. Labor productivity, of net output per worker (in hours) | 17. Resource yield over total output |
| 9. Surplus product norm, profit per worker | 18. Resource yield over net output |
| | 19. Profitability-resource ratio |

An indicator analysis by row (Table 1) shows that the indicators' common characteristics are determined by the invariability of the common denominator, while the differences are determined by the employment of diverse indices for the assessment of the results of economic management. The indicator analysis by column reveals the converse relation: The groups' common characteristics result from an identical numerator, and the differences--from the diversity in the accounting of input and resources. On the basis of the analysis of Table 1, it is possible to predict the characteristic advantages and shortcomings of the various indicators for the different forms of production and types of economic operation in accordance with their arrangement in one of the groups. Thus, in view of the fact that normative net output becomes the directive indicator, the calculation of the output-capital ratio (capital-output ratio) will be subject to regularities characteristic of the indicators of Group 8, not Group 7.

With the introduction of the wage norm per ruble of net output in place of the presently used norm per ruble of gross output (transition of the indicator from Group 1 to Group 2), an advantage is obtained: It will no longer be possible to reduce the relative wage share of a ruble of output by virtue of overproduction of heavy, large-scale, raw material- and materials-intensive products.

Thus, indicators based on net output will be of crucial importance in the evaluation of the economic operations of the ministries, associations, and enterprises. However, insofar as for a number of sectors commodity

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production will remain the directive indicator, the other groups of indicators will continue to be operative as well.

The Types and the Economic Character of Net Output

During the period from 1969 to 1971, 106 enterprises in the country used the actual net output indicator which was calculated by excluding the physical input from the actual (gross) commodity output (production method) or by totaling up wages and profit (accounting method). Experience has shown that in principle it is possible to use this indicator. But it goes without saying that in regard to implementation, there were difficulties as well. Specifically, this indicator has been criticized for its poor practicality: It is only after 18 to 20 days in the month following that under review that the data become known. Presently, this situation has essentially been remedied, since the data concerning the quantity of actual net output can be had at the same time at which are also obtained the profit and wage data that are an integral part of net output. The real difficulty lies in the fact that in those enterprises in whose commodity output industrial, assembly and other operations and services account for up to 8 to 10 percent, and complex prime cost items, for up to 6 to 8 percent, there arose difficulties in regard to allocating these elements to physical input and wages. In the calculations, there cropped up relativities and inaccuracies; in regard to a number of general plant and shop outlays, it was not clear what they should be put down to--to net output or to physical input. However, this difficulty has now been overcome as well.

Along with actual net output, there has been tested and substantiated the standard net output indicator, i.e. actual net output augmented by the depreciation value.

In an experiment conducted in 1973, the volume of net output came to be calculated on the basis of norms ($v + m$) representing that part of the wholesale price that remains after deduction of physical input (c). During the period from 1973 to 1975, this approach was employed for individual enterprises, while from 1976 to 1978 it was used for individual ministries as a whole. Provision was made for two variants of norms: The variant including the individual profit (i.e. to the extent to which it is determined in the wholesale price) and the variant adding to v the averaged profit. The ministries have been granted the right of selecting the norm. Thus, the Ministry of Shipbuilding Industry right away used the averaged profit norms.

Normative net output is a summary valuation of living labor input in which the norm is the level of the socially necessary input of living labor per unit of output, which is worked out on the basis of the wholesale price reflecting the level of the socially necessary input of living and past labor. In the cost-accounting categories of the enterprise, it consists of basic and supplementary wages, social insurance deductions, profit and net output in complex items (general plant and shop outlays, current outlays

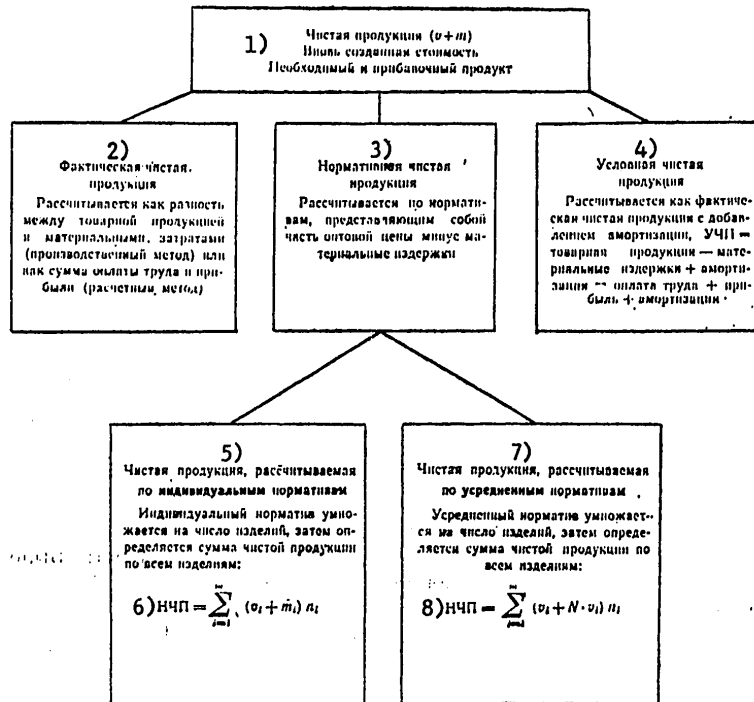
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on the maintenance and operation of equipment, expenditures on production preparation, and other complex items). This valuation of living labor is intended for the enterprise's internal use and does not affect the wholesale and retail prices, and the net output norm based on it is not connected with the norms of the enterprises of suppliers and customers. In the base year, there is almost no quantitative difference between actual and normative output. Eventually, their numerical values begin to differ and this circumstance is taken into account by special methods of calculation. Like any normative valuation, normative net output is characterized by merits and shortcomings. However, there are many enterprises in which it is more correct to carry out the calculation of production volume and labor productivity and the control of wage fund expenditures on the basis of normative net output, not of commodity output, insofar as in such enterprises employment of this indicator helps to increase labor and production efficiency.

The diversity of net output indicators is shown in Figure 1.

Figure 1



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Key:

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| <ol style="list-style-type: none"> 1. Net output (v + m)
Newly created value
Necessary and surplus product 2. Actual net output
Calculated as the difference between commodity output and physical input (production method) or as the sum of wages and profit (accounting method) 3. Normative net output
Calculated on the basis of norms representing part of the wholesale price minus physical input 4. Standard net output
Calculated as actual net output with depreciation added.
Standard net output = commodity output - physical input + depreciation = wages + profit + depreciation | <ol style="list-style-type: none"> 5. Net output calculated on the basis of individual norms.
The individual norm is augmented by the number of products, upon which the total net output in regard to all products is determined 6. Normative net output = 7. Net output calculated on the basis of averaged norms.
The averaged norm is augmented by the number of products, upon which the total net output in regard to all products is determined 8. Normative net output = ... |
|--|---|

By and large, the production volume and labor productivity indicators based on actual, standard, and normative net output are based on the rule of the correlation of input and results: The product of living and past labor must be compared with the total input, while the input of living labor must be compared only with the "net part" of output.² Productive is only the living labor, to which corresponds--in the cost calculation of output--the sum (v + m); its average magnitude per worker must be computed also for the productivity of living labor, which is not inflated at the cost of the transfer value of the means of production.

Strictly speaking, it is inaccurate to assume that the product of living labor is the positive difference between results and physical input. What is to be done in those cases, in which, for example, the wholesale prices for various articles are fixed at the prime cost level or even lower? The result of living labor is the total output (c, + v + m), in which the input of past labor compensates c, while the newly created value (v + m) corresponds to the input of living labor. Characteristically, in practice it is impossible to indicate precisely which set of articles of physical output--consisting, for example, of 10,000 dresses, 5,000 men's suits, and 2,000 children's articles--is exclusively the product of living labor. For this reason, members of the enterprises' economic services hold that in terms of value a certain part of these articles compensates the input of producer goods, while the remainder compensates the input of living labor. When only a single unit of an article is produced (blast furnace, papermaking machine, ocean liner), it is difficult to make even such a breakdown. Thus it is only in terms of value that the output is divided into a compensatory and a net part. In this respect, it is important to

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keep in mind that in regard to the value equaling the compensatory part, every unit of a set of products on its part consists--just like any unit of net output--of input of living and past labor.

Elaboration of the Net Output Norms

The net output norm is regarded as a cost-accounting valuation of the socially necessary input of living labor. Practically, its elaboration at the time of the experiment meant the calculation of a new wholesale price (without regard for physical input) for the product or type of operation. These norms were for the most part worked out at the enterprises, coordinated and endorsed at the main administration and the sectoral institute, and confirmed by the ministry.

Beginning in 1980, as the final elaboration of the association (enterprise) norms takes place, all-union wholesale price lists will be used, with the corresponding norms being assigned. By decree of the CPSU Central Committee and the USSR Council of Ministers, this work has been entrusted to the USSR State Price Committee. The ministries (departments) that have been charged with working out the plans for the new wholesale price lists to be introduced on 1 January 1982 calculate at the same time the net output norms and submit them for confirmation to the State Price Committee. The organizations drafting the plans for the new wholesale prices calculate the net output norms for the whole range of products of the given price list, regardless of the respective departmental subordination of the manufacturer of these products. The norms are formed on the basis of the "Systematic Directives Concerning the Order of Elaboration and Application in the Planning of the (Normative) Net Output Indicator" that were confirmed by the USSR State Planning Commission, the USSR State Price Committee, the USSR Ministry of Finance and the USSR State Labor Committee and coordinated with the USSR Central Standardization Administration on 12 September 1979.³

In the elaboration of the new wholesale prices, all constituent parts of commodity production will be taken into account: Finished products and semimanufactures sold on the side; major repairs of equipment and means of transportation; single orders, industrial operations, and other output. For the products and types of work that are planned and taken into account only in terms of cost (production of spare parts, nonstandard and technological equipment, and accessories; industrial operations), the norms will be calculated as a quota (in kopecks) per ruble of output.

It is stipulated that the planned rates of increase of labor productivity be calculated on the basis of the normative net output volume and the number of industrial workers engaged directly in production--as these elements are specified in the plan--while the actual rates will be calculated on the basis of real implementation. The enterprises will receive the wage fund in accordance with the degree of fulfillment of the normative net output quotas. The control of wage expenditures should be

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carried out by comparing the rates of increase in output according to the normative net output and the rates of increase in average wages. The planning and evaluation of the utilization of producer goods will be carried out through the output-capital ratio on the basis of normative net output. The norms should be permanent for the entire planning period (5 years).

The principles underlying the elaboration of the individual and averaged norms for products and types of work are shown in Table 2.

Table 2. Elaboration of Individual and Averaged Net Output Norms (in rubl.)

2) абсолютный размер	1) Оптовая цена			4) Индивидуальные нормативы $v + m$	5) Усредненные нормативы $v + N \cdot v$	6) Прибыль	
	3) структура					7) выигрывает +	8) потери -
	c_1	v	m				
2006	1256	300	450	$300 + 450 = 750$	$300 + 360 = 660$		-90
1494	994	200	300	$200 + 300 = 500$	$200 + 240 = 440$		-60
978	648	150	180	$150 + 180 = 330$	$150 + 180 = 330$		
672	472	100	100	$100 + 100 = 200$	$100 + 120 = 220$	+20	
507	387	60	60	$60 + 60 = 120$	$60 + 72 = 132$	+12	
108	53	55	...	$55 + \dots = 55$	$55 + 66 = 121$	+66	
164	64	50	50	$50 + 50 = 100$	$50 + 60 = 110$	+10	
68	35	35	...	$35 + \dots = 35$	$35 + 42 = 77$	+42	
123	60	30	33	$30 + 33 = 63$	$30 + 36 = 66$	+3	
77	30	20	27	$20 + 27 = 47$	$20 + 24 = 44$		-3
		1000	1200	2200	2200	+153	-153

Key:

- | | |
|----------------------|-------------------|
| 1. Wholesale price | 5. Averaged norms |
| 2. Absolute quantity | 6. Profit |
| 3. Structure | 7. Gains |
| 4. Individual norms | 8. Losses |

The result of the division of the total profit (1,200 rubles) by the total living labor costs (1,000 rubles)--which represents the surplus product--is 1.2 ($N = m : v$). The net output according to individual norms equals 2,200 rubles. Applying the coefficient 1.2 to the wages--separately for each product and type of operation--one obtains the same sum, insofar as the profit losses (- 153) in regard to profitable products are compensated by the profit (+ 153) on unprofitable products and products of low profitability. The volume of net output according to individual norms conforms precisely with the volume of net output according to averaged norms, even if the profitability-wage ratio is calculated not on the basis of the wholesale prices, but directly from the actual commodity output. Thus, if the output structure is $78c + 10v + 12m$, then $N = 12 : 10 = 1.2$ will be the same as if it had been calculated on the basis of the wholesale price of articles that are part of the commodity output.

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The Advantages of Normative Net Output in Cost Accounting

Normative net output substantially reduces the enterprises' interest in the production of material-intensive and heavy products; it motivates the collectives to economize on all types of physical input, helps to increase the output of products of higher quality, of complementary articles, spare parts, goods for cultural-personal and household use, and to increase the volume of industrial operations, specifically in regard to current repair, major overhauls and modernization of equipment.

The averaged norms substantially limit the enterprises' possibilities of increasing net output at the expense of articles and operations for which higher individual norms were established. In this case, the differences in advantage between the products and operations are reduced, since the averaging of profit reduces the differences in the profitability of the goods produced. But this does not signify total elimination of the structural shifts: That which was unprofitable on the basis of individual norms becomes profitable on the basis of averaged norms. Strictly speaking, in itself net output with averaged profit does not solve the problems of the given products list, since, as is well known, one or another of its advantages shows up in any cost calculation of output. In both the individual and the averaged norms, the tendency toward "big" wholesale prices is maintained. Experience has shown that the enterprises are interested in producing articles, in the prices of which the profit share is high, and that they then uphold prices containing a large amount of profit. In a price structure of 40c + 25v + 35m and 70c + 15v + 15m, the first price (35 : 25 = 1.4, not 15 : 15 = 1.0) turns out to be preferable; in a structure of 60c + 20v + 20m and 600c + 200v + 200m, the second article becomes profitable.

As a rule, the planned volume of net output according to averaged norms differs from the net output volume that would have been stipulated for individual norms. This difference will be greater, if more products are planned whose averaged norms exceed the individual ones, and conversely, the enterprise loses part of the net output, if the plan provides for an increase in products, the averaged norms of which fall short of the individual ones. However, this difference, which is caused by a structural shift, is considerably smaller than that which would arise with an absolute increase in highly profitable products and an absolute decrease in the output of products of low profitability.

The experience gained in its introduction by many enterprises confirms that it is economically expedient to use the normative net output indicator.⁴ Thus, the "Elektrostal'montazh" [Electro-Steel Assembly] Production Association has been using the net output indicator since the middle of 1977, which has enabled the association to reduce the input of materials, fuel and electric energy; production has become less materials-intensive. In the Glavmospromstroymaterial [Moscow Main Administration for Industrial and Construction Materials], the employment of the net output indicator

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has had a positive effect in regard to fulfillment of the products list targets: Of 23 enterprises, 20 fully met the product output quotas in accordance with the products list. The enterprises showed great interest in the development of progressive designs.

At the Leningrad Chemical-Pharmaceutical Plant, at the Leningrad "Russian Diesel" Plant, at the Penza Diesel Plant and at the Kiev Printing Machine Plant, the experiment has shown that in the calculation of labor productivity on the basis of net output with averaged norms, the basic products turn out to be those that require professional expertise and creative work. In the "Sevzapmebel" [Northwest Furniture] Production Association, where the indicator of net output with averaged norms has been used for several years, material resource economy has been intensified and the output of products has been increased in accordance with the product assortment plan.

The indicator of net output with averaged norms should be introduced in the enterprises of those industrial sectors, in which its advantages over the indicator of (gross) commodity output will be very apparent. Specifically, these sectors include the machine building industry, which is characterized by a diversified product mix and structural shifts offering diverse advantages, the metalworking industry, which manufactures products to be used in machine building (metal strips and wire products, forgings, dies for stamping, fastenings), the enterprises of the construction industry, in which the "output of tonnage" is large. This method could well be used in rolling mills; here the introduction of net output will stimulate the output of rolled metal of dimensions most approximate to those needed by the machine building industry (sectional rolled steel, shaped wire rods, thin-walled pipes, surface-treated sheet metal, and other products). The method could well be used in foundries, where it would help to avoid overstating the weight of ingots, etc.

The Material-Output and Capital-Output Ratios in Normative Net Output

In regard to the normative net output indicator, the economic concepts of "material-output ratio" and "capital-output ratio" should be used in a different sense than in regard to commodity or gross output, since in contrast to the latter the input elements c_{total} and c_{basic} simply do not exist in normative net output. This also applies to the indicator of actual net output, although the volume of actual net output changes in accordance with the changes in physical input.

In present practice, the role of the production cost indicator is somewhat depreciated. Nevertheless, for enterprises that use the indicator of normative net output the production costs are not an intermediate, but the final indicator of the actual use of embodied labor resources. The argument that there is no point in calculating production costs, if the enterprise is profit-oriented, is inappropriate in the present case, since of importance to the enterprise is not only the growth of m , but also an increase of $v + m$. In the attempt to increase the volume of normative net

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output, one can lose control over the reduction of working capital input. Thus it is necessary simultaneously to calculate and analyze the changes in capital goods input.

In our view, the current opinion concerning immediate coordination of the incentive fund allowances with the "net yield on capital" is erroneous. The new equipment introduced in the enterprise is as a rule 2 to 3 times as expensive (or even more than that) as similar old equipment, while its technological productivity is only 1.5 to 2 times as great. For this reason, the yield on capital, which is calculated as the ratio between net output and the value of the basic equipment on the balance sheet, naturally decreases. It is likewise natural that operation of new fixed capital reduces (relatively and absolutely) the labor-intensiveness of the production programs, which in turn is manifested as a tendency toward a lower cost calculation of net output. In those enterprises, in which the net output increases more rapidly than the gross output, the yield on capital declines more slowly. Thus, processing an ever-growing quantity of raw material and materials by means of new tools of labor and substantially reducing the labor-intensiveness of production and the overall input of living and past labor per unit of output, the enterprises turn out to be in unfavorable conditions for the entire period during which the new resources are put in operation. It appears that for the period of the enterprises' transition to operations evaluation on the basis of net output, the indicator of yield on capital should be used as an accounting indicator.

Wages According to Normative Net Output

In order correctly to coordinate the dynamics of normative net output with the wage dynamics, the wage norms per ruble of net output have been introduced. For this purpose, the associations (enterprises) have been granted the right to pay--by virtue of wage fund savings achieved over against the established norm--salary and wage rate increases.

In the application of the method of normative wage expenditures and, based on it, of providing the industrial workers with incentives, experience has been gained. This method has produced good results in enterprises in which the volume of commodity output was not overstated at the expense of favorable structural shifts. Application of the method in regard to normative net output is free from such a drawback. Here, in the planned wage fund its savings in comparison to the normative outlays can be achieved only if there is an increase in the output of products. Automatically, this means that savings over against the normative wage expenditures can be achieved, provided that the rates of production increase exceed the growth rate of the planned wage fund (including wage fund bonuses).

Presently, there have become apparent the shortcomings of a recent motivation practice, a serious flaw of which is the enterprises' lack of interest in reducing the number of workers. There are hidden as well as overt

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surpluses of manpower. In many enterprises, the labor surplus at times reaches 10 percent.⁵ Following the normative approach to the planning of wage expenditures, this shortcoming can be eliminated, especially in combination with the application of the Shehekino Method of regulating the permanent work force.

Improvement of the Normative Net Output Indicator

Attention should be directed to the constructive proposal by S. Voyenushkin, L. Valentinov, E. Belov and Yu. Mironov concerning the calculation of an accounting net output obtained by excluding from the net output payments for producer goods, loan payments, pensions, and also fines, sanctions and forfeits.⁶ The above authors propose that this indicator be calculated on the basis of actual net output, but this approach is applicable to normative net output as well. According to prevailing regulations, the payments for producer goods and the fixed payments are budgeted from the enterprise's profit; consequently, when the total fines are excluded, the remaining part is the accounting net output. Reducing the normative net output by the amount of fines, sanctions and forfeits paid to a customer for the breach of an economic agreement, or increasing it by the amount received from suppliers in compensation for damage caused allows to reflect in the proposed indicator the extent to which the collective has met its obligations vis-a-vis the associated producers.

In the application of the normative net output indicator, the payments for resources, the interest on loans, the fixed payments and the pension payments "form" that part of it which is not directly attributable to the enterprise--it is an additional part resulting from better management conditions. The economic purpose of reducing the normative net output by the amount of payments for resources, interest on loans, and fixed payments, and of reducing (increasing) it by the total amount of fines is to provide an incentive for a better utilization of natural, financial and production resources. As the utilization of equipment, state loans, and natural resources improves, the enterprise's payments for these items are reduced and the volume of accounting net output increases. This indicator can be used in a differentiated way for economic as well as technical-economic analysis.

The dialectics of the use of the normative net output indicator consist in the fact that on the one hand the indicator does not reflect the yearly change in producer goods input, while on the other hand it is itself not free from the influence of embodied labor input. For part of the normative net output is the profit which is fixed in the wholesale price, with the material assets expended taken into account. For this reason, it is proposed to establish the profitability of an article not on the basis of the formula $m : (c + v)$, but in the form of $(m : v)$, i.e. in proportion not to the sum total of the resources expended, but only to that part of them which corresponds to the living labor costs. In this case, one obtains a more accurate expression, without any "admixtures," of the

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value of the newly created output.⁷ This approach is acceptable for analytical purposes. However, this method is highly labor-intensive, since for the entire list of wholesale prices used at the enterprise it is necessary first to correct m in proportion only to v and then to do additional work in regard to elaboration of more precise norms. By and large, assessment of the organic structure of production ($v : c$) is prerequisite to correct price fixing.

Along with the proposal concerning elimination of the effect of the volume of physical input on the value of m in the net output norms, the opinion has been advanced that the latter should be determined by a single method--by excluding not only the value of physical input, but also the profit added.⁸ Such an approach can be employed as well, but in terms of economic substance it represents an indicator similar to that of normative processing cost.

Unsolved Problems

The economic characteristics, the principles of utilization and the practical application of the normative net output indicator are sufficiently clear. Substantial theoretical studies have been carried out and the indicator has undergone practical testing for almost 10 years. The experiment has shown the indicator's advantages, but at the same time it has bequeathed to the practitioners a number of unsolved problems. Its introduction as a new directive indicator can give rise to difficulties, vaguenesses and conditionalities.

In this connection, it is important first of all to formulate a correct theoretical-methodological conception of the norm as the level of socially necessary input of living labor. In the political economy of socialism, the socially necessary input is determined in conformity with the total input of living and embodied labor. Insofar as the variables C , and $(v + m)$ forming part of the socially necessary input differ for various products and in various enterprises, the norm worked out on the basis of the average sectorial wholesale price will differ from the norm formed on the basis of individual input. Apparently, the norms will frequently diverge from the socially necessary level of living labor input, since the real dynamics of the latter decline, while the norm remains constant for several years. By and large, this means that already at the stage at which the norms are drawn up, it is necessary to approximate them as much as possible to the socially necessary level of living labor input.

It is contrary to expectations, for example, that a number of chemical-pharmaceutical and furniture firms producing finished products do not have wholesale prices. Their output is calculated in sales prices or in retail prices including turnover tax and other price elements. In such cases, what are the norms to be based on? At present, there is no single approach; both sales prices and planned production cost calculations are used.

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In the scientific literature, there has been no elaboration of the problem as to how the review of the output norms will affect the volume of net output. If there are no corrections providing for the lowering (raising) of estimates, the norms established will after a while no longer correspond to the real labor input.

Instructional materials recommend to work out the norms on the basis of average sectorial, regional and zonal prices. However, the individual differences in living labor input are so substantial that this requires special consideration, or else the norms will not stimulate any reduction in input, if they are overstated, or, if they are understated, they will be too disadvantageous. It appears that in practice the principle of working out the norms on the basis of the average sectorial wholesale prices should each time be corrected on the basis of the enterprises' individual characteristics that determine their actual input of living labor.

The averaged norms are considered to be preferable, but for enterprises that are not in a position to change the product assortment individual profit norms are more advantageous. In cases of this kind, the association management should meet halfway even a single enterprise, in spite of the fact that the other enterprises operate in accordance with averaged norms. Moreover, enterprises that do not tolerate increased physical input and that are restricted by a rigidly set product assortment generally require neither individual nor averaged norms. We feel that in such cases it is advisable to use the indicator of actual net output.

Both scientists and practical experts are agreed that the big and complex job of working out the norms will be successfully carried out. However, there are arising specific sector-related difficulties--e.g. in the machine-tool and instrument plants that produce hundreds of thousands of components and spare parts. In these plants, it is very difficult to work out norms for the entire products list; consequently, the proposal to establish a norm for R 1,000 of related, homogeneous products appears to be correct.

If the averaging coefficient ($m : v$) is calculated on the basis of commodity output with a large share of products of low profitability, the averaged norms can put too low the profit in the following year. And conversely, calculation of the averaging coefficient on the basis of a large share of profitable products overstates most of the profit. We feel that this circumstance calls for elaboration of special statistical methods of equalization. Some economists are alarmed by the fact that a number of norms exceed the wholesale price, when the profit is averaged. Other economists who see that there are parallel profit losses in regard to other products are not disturbed by the fact that the averaged norm exceeds the wholesale price by a factor of 1.2 to 1.5. Opinions differ as well in regard to the establishment of norms for unprofitable articles. Many economists hold that addition of profit to unprofitable products does not motivate the production collectives to reduce the production costs of articles for which the production expenditures exceed--through the enterprise's fault--the

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average sectorial outlays. We feel that this problem can be solved in the following way: For products for which the wholesale prices have been fixed below prime cost, the diffusion of averaged profit is entirely permissible. As regards articles, the production expenditures for which considerably exceed the average sectorial wholesale price, one should not employ profit averaging, since here there really is potential for reducing the total input per unit of output.

In the transition to the normative net output indicator, the labor productivity growth rates increase somewhat more rapidly. For this increase, supplementary wages are paid. In the scientific literature, discussion revolves around the question whether these supplementary wages are justified by material economy. Introduction of the wage norm per ruble of normative net output and the supplementary payments based on wage savings over against this norm eliminate this problem; however, here too it is essential to know the volume of material savings: An enterprise can achieve savings over against the norm, while allowing excess input of embodied labor. Such cases will be solved by special methods of bonus reduction.

Thus, in the enterprise's economic cost accounting system, there has appeared a new conclusive indicator--normative net output. Its principal advantage is the fact that it has become possible more correctly to measure living labor efficiency undistorted by gross evaluations. The fact that normative net output has been placed into the foreground does not mean that the other economic indicators have become less important. They will continue to operate in the general system of indicators tested in 50 years of practical utilization.

FOOTNOTES

1. See VOPROSY EKONOMIKI No 2, 1977, p 126.
PLANOVOYE KHOZYAYSTVO No 1, 1978, pp 54-55.
2. See V.V. Novozhilov, "Developmental Trends in Regard to the Measurement of Labor Productivity in the USSR," in: "Trudy Leningradskogo Inzhenerno-Ekonomicheskogo Instituta" [Transactions of the Leningrad Institute of Engineering Economics], No 44, Leningrad, 1963, p 35.
3. See EKONOMICHESKAYA GAZETA No 40, 41, 1979.
4. On 1 July 1979, over 830 enterprises used the normative net output indicator.
5. See PRAVDA 26 Apr 77.
6. See PRAVDA 7 Jan 78.
7. See V. Belyakov, "The Lessons of the Experiment," PRAVDA 3 Feb 78.
8. Ibid.

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ECONOMIC MODELING AND COMPUTER TECHNOLOGY APPLICATION

BOOK ON MODELING DEPLOYMENT OF ECONOMIC BRANCHES REVIEWED

Moscow VOPROSY EKONOMIKI in Russian No 1, Jan 80 pp 140-142

[Review by M. Vilenskiy of the book, "Osnovnyye metodicheskiye polozeniya optimizatsii razvitiya i razmeshcheniya proizvodstva" [Basic Procedural Rules for Optimizing the Development and Siting of Production Facilities], which was edited by A. G. Aganbegyan and N. P. Fedorenko, Izdatel'stvo Nauka, 1978, 271 pages].

[Text] The combining of an analysis of the underlying theoretical problems of optimizing the development and siting of production facilities with a statement of concrete procedural rules that can be used in design and planning practice to resolve the tasks of improving the regional organization of production is characteristic of this book. It is this element that determines the practical orientation of the research performed, and the procedural rules for optimizing the development and siting of production facilities emerges in the work as a result of serious theoretical generalizing.

The monograph's structure is good. In the first part, which consists of three chapters, the bases for a Standard Procedure for Optimizing and Siting Production Facilities is laid down, the purpose of making these analyses is formulated precisely and the prerequisites for its achievement are described. Among them, aside from such purely economic prerequisites as the demand for the product and the availability of the resources, the role of social and economic factors is disclosed.

The authors indicated the main stages of optimization of analyses for development and siting (there were 11 of them), which make up a single system, and not one of them can be omitted without harm to the completeness and authenticity of the analyses being performed. Especially great significance is attached to determining the tasks or purposes of developing the sector, preparing baseline information for the correct formulation and solution of the task, making an economic analysis of the results of solving the task, and formulating recommendations for the adoption of the planned solutions.

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Raising the question of optimization criteria is, in our view, extremely fruitful. The authors consider that the criteria can be changed as a function of the specific purpose of the task. This can be both a minimization of the aggregate expenditures and a maximization of the savings from the production and use of the sector's product in the national economy, and also the maximal output of a highly effective product that is scarce. However, the last of the criteria named can provoke objections. In a balanced economy with an optimal structure, there should be no scarce products. A shortage in and of itself cannot be an economic criterion. A shortage is an expression of a lack of balance and errors in planning. It seems to us also that a combining of the concepts of "highly effective" and "scarce" products (page 9) is not legitimate. If a product is highly effective, then the volume of its output should preclude a shortage. It is desirable to compensate for a possible raw material shortage through imports.

The book classifies optimization tasks in accordance with a number of indicators: in accordance with a selected optimization criterion, the nature of the production facility being optimized, the time scale, and so on. In so doing, the type of task depends upon combining therein the enumerated indicators. Therefore, it is impossible to propose in the Standard Procedure a single model from mathematical economics that will describe the whole set of combinations of classificational indicators. And the authors correctly recommend that specific models be developed, based upon said Standard Procedures, for taking into account the specifics of concrete tasks. The monograph examines only three examples of task models that are resolved in accordance with the criterion of minimum expenditure. These are a production and multiple-product statistical task with discrete variables, and of the same type, a dynamic task and a transport-operations and multiple-product statistical task with discrete variables. The choice of these tasks was good, for they are highly typical. The value of these models is their simplicity and precision, which makes them acceptable for planning workers. A number of the general propositions of the first chapter are spelled out in detail here, and methods for computing capital costs with all their components are recommended. In so doing, the authors propose formulas for the computation of weighted-average expenditures for single-product and multiple-product output, for adjusted expenditures that take the time factor into account, and for the indicator of overall expenditures that is used in formulating the dynamic task.

The recommendations for preparing baseline information for solving optimization tasks are useful, in our view. There is no need to prove to what extent the volume and, the main thing, the quality of such information affect the authenticity of the solution. The book not only indicated what information is necessary but it also characterizes the sources for obtaining it and the workings of its preparation for inclusion in the model.

The makeup of the baseline information is determined by the content of the task and the type of model that is chosen for it from mathematical

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economics. But the listing of data cited by the authors for the task for a minimum of expenditures for a static transport operations model is so detailed that it can also be used, with some supplementation, for solving tasks of another type.

It should be noted, however, that in addition to what the authors propose, it would be desirable also to include the indicators of technical progress in the information on production methods. To restrict the inclusion of this factor only to particular or special procedures, as is recommended on page 20, is, in our opinion, unwarranted. It also seems to us that the question of evaluating natural resources is not covered in the work in due measure. Thus, the book proposes to consider the expenditures connected with the use of natural resources (land, useful minerals, water and others) in accordance with their appraisals, provided that such appraisals exist. And what if such appraisals do not exist? Moreover, the authors determine expenditures for raw materials, fuel and energy in accordance with the assessments of the optimal plan of the corresponding sectors. Consequently, if there are assessments of deposits of, let's say, coal, then it must be assessed in the optimization tasks in accordance with those assessments and, moreover, in accordance with the assessments of the coal industry's optimal plans for development. Is there an argument for such a recommendation?

The authors paid much attention to analyzing the makeup of capital investment; this reflected the capital expenditures for protecting the environment, which usually are not considered in the procedures. The structure of current expenditures also are deciphered in detail. It is true that the authors have not answered the question of whether the outlays associated with the operation of equipment for protecting the environment, particularly purification structures, are to be included in the current expenditures of the activity being sited. As for the methods recommended by the authors for adjusting expenditures for a single moment in time, these are well known in economic theory and practice.

Recommendations for analyzing the results of solving optimization tasks occupy an important place in the monograph. Such an analysis can be viewed as a concluding stage of the optimization process, which serves as a basis for the adoption of final decisions by the control organ. As the authors correctly propose, this is a singular repetition of the whole process of compiling a model and solving the task, which is performed in the reverse direction, that is, it ignores the results obtained during the solution.

However, in our view, when analyzing the solution, such an important factor as the socio-political conditions for implementing one variant or another for developing and deploying production facilities also should be considered. Although it is among the factors that, the authors say, influence the formulation of the plan for developing and siting, nevertheless it obviously is not considered in the models they propose because of the complexity of its quantitative evaluation.

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The second part of the book consists of nine chapters, each of which is devoted to optimizing the development and deployment of a definite sector: the coal, petroleum-recovery and electrical-equipment industries, ferrous metallurgy, electric power, the forest-industry complex and agriculture. The book proposes models from mathematical economics that will enable development of the enumerated sectors to be optimized, taking into account their specific characteristics, with regard both to the prerequisites for developing the national economy's requirements for a given product and to the raw materials resources and their distribution about the country's expanse. Each of these chapters implements, relative to the specified sectors, the basic procedural rules that are laid down in the book's first three chapters.

It is important to emphasize that the sector procedural rules laid down in the book being reviewed have already been taken into the armamentarium of our economic practice. The head NII's [scientific-research institutes] of the appropriate sectors, jointly with TseMI [Central Institute of Mathematical Economics] of the AN SSR [USSR Academy of Sciences], and also the Institute for the Economics and Organization of Industrial Production of the SO [Siberian Division] of the AN SSSR has performed concrete analyses of the development and deployment of a number of sectors. Thus, the results of optimized analyses for development and deployment of the mining and preparation of steam coal were made the basis of a plan for developing the sector during 1980 and of long-range plans for 1985 and 1990 that USSR Ministry of the Coal Industry has worked out. An optimized model for the development and deployment of facilities for producing ferrous metals (pig iron, steel and rolled metal) for the country as a whole has been used in practice. Similar analyses are being made by IEiOPP [Institute for the Economics and Organization of Industrial Production] of SO AN SSSR at the regional level for Siberia and the Far East. An optimized multiple-product model for the forestry complex was made the basis for working out a plan for developing the USSR's forestry complex.

These examples do not by far exhaust the positive results that have been obtained in various sectors through the use of the procedural rules that are contained in the book being examined while plans for developing and deploying the appropriate production facilities were being worked out. But even the cited examples are adequate to appreciate the merits of the monograph's practical orientation.

This book is remarkable in still another aspect. It indicates how fruitful joint work under a single plan can be for a number of institutes and scientific institutions that study urgent national-economic problems.

While the book being reviewed is evaluated positively, it should be noted, at the same time, that the optimization models cited in the monograph embrace only a small part of the task to be solved and the book does not by far exhaust the problem of the rational placement of production facilities as a whole. These models for development and deployment should be improved even more. An important virtue of the monograph is that the authors have managed to mark out paths for such improvement.

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REGIONAL DEVELOPMENT

FORTHCOMING CHANGES IN RURAL DEVELOPMENT

Moscow VOPROSY EKONOMIKI in Russian No 1, Jan 80 pp 78-89

[Article by V. Stern: "Prospects for Rebuilding the Countryside"]

[Text] The development of rural construction is an important link in the party's agrarian policy, which is counting on a rise in agriculture's role in raising the people's welfare. Because of the NTR [scientific and technical revolution] and the dynamic development of the country's economy, a considerable uplift in agricultural production is occurring at a time when labor resources are leaving this sector and agricultural land is limited.¹ In July 1978 the CPSU Central Committee plenum emphasized the need to maintain in the future a substantial increase in capital investment aimed at developing the country's agricultural-industry complex and also the countryside's social sphere. Now a system of measures is being implemented that will provide for solution of the economic and social tasks that the party has posed in the CPSU Program. Since 1965 the state and kolkhozes have invested more than 40 billion rubles in facilities for nonproduction purposes, or three-fourths of all investment in the rural social sphere during the whole history of the Soviet state.

Reconstruction is a component part of the program for transforming the countryside, which involves both the production and the nonproduction spheres and the system of social relationships. Reconstruction tasks are concretized in the form of specific normatives: social standards, construction norms and regulations, and sanitary-hygienic and other special requirements.

The frontiers of social development are not static. Social requirements are occasioned by the potential of the economy; as K. Marx noted, "mankind sets for itself only those tasks that it can resolve."² Purposeful control of reconstruction of the village is being realized by legislative enactments, plans, standards and economic stimuli (privileges, payments and credits) and also on the basis of the formation of a social psychology (interests, aims, orientation and preferences). The effectiveness of managing the reconstruction depends greatly upon an analysis of the existing situation, an evaluation of the alternatives for solving the problems that arise during development, and optimization of these solutions.

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Practical considerations pose the task of settling people in promising places. The development of sovkhoz and kolkhoz settlements does not do away with the problem of involving the residents of small settlements in the sphere of services and of intensive production and social contacts. About half the rural populace lives in such places, and fixed capital running into tens of millions of rubles has been concentrated in them. The overwhelming majority of such settlements are cut off from modern roads, and the creation of small services enterprises for isolated settlements would lead to low effectiveness of their operation, high costs for building and operating the enterprises, and an increase in servicing-personnel manpower. Consequently, a differentiated approach and the development of rational ways of improving the settling of people are necessary here. The desirability of the further use of small settlements was emphasized in V. Shcherbitskiy's report to the April 1979 plenum of the KPU [Communist Party of the Ukraine] Central Committee.

Reconstruction of the countryside requires an expansion of housing construction. Right now the housing inventory per rural resident is, on the average, as great as that of the city resident. In most cases this housing has insufficient amenities, even with full electrification (99 percent). Of the available inventory, 1 billion square meters of the total area, or more than 80 percent of it, are in individual homes, which are the personal property of the population. Design practice, as a rule, aims at a radical change in the existing proportions in favor of the social inventory (master plans for villages often allocate 70-80 percent). Realization of such a program would require that 6-7 billion rubles be spent annually for rural housing construction during coming decades. Suffice it to say that this exceeds the annual program of all the construction and installing work of Minsel'stroy [Ministry of Rural Construction] (5.2 billion rubles under general contract in 1978). Expenditures for operating the village's housing inventory and municipal services would grow proportionately. Because of this, the problem of choosing courses for developing the rural housing buildup, with a determination of both financing sources (or form of ownership) and three-dimensional layout and constructional solutions of the buildings, is urgent.

Building up the countryside involves a withdrawal of land and the subsequent use thereof. The opinion that a conversion of the extensive type of buildup that exists in the countryside to the construction of housing of more stories will enable land that is used for agriculture to be saved has become a well-known stereotype. It is not considered here that the norms for private-plot allotments are governed by law (or by the kolkhoz charter), regardless of the number of stories of the housing or where the families reside.

A solution of the problems of settling people, formulating a buildup of housing, and making use of the land will enable the areas of capital investment and the priority thereof to be refined and the construction policy for the countryside to be improved. These problems should be reviewed in the light of the overall long-range tasks of transforming the countryside, otherwise the necessity for additional expenditures for

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eliminating the consequences of palliative solutions will arise. Therefore, before proceeding to determine the way to solve these problems, a number of fundamental assumptions should be refined and the policies for developing the countryside defined. In particular, these questions must be answered: what changes will occur in the content and forms of rural habitation, how will the number of the rural population be changed, and in what way will the influence of overall social factors be reflected in the lifestyle of the rural population?

An improvement in settling the rural population reflects the effect of the economic laws of socialism. It is aimed at improving the use of productive forces, raising the productivity of social labor, and providing the widest accessibility of workers to the material and cultural values of society that exist both in the city and the countryside (natural parks, bathhouses, historical spots, sanctuaries, game refuges, recreation areas and so on).

The planned placement of production facilities and of the population does not mean the abolition of small settlements, curtailment of the existing settlement network in inhabited regions, and the organization of consolidated urban-type settlements alone. The status of rural communities is determined by the activity of the population, a peculiarity of which consists in the use of land (as the main means for production in agriculture) and of the biological resources (and subjects) of labor, the dispersed state of the work sections, the known dependence of the results of labor on nonreproducible local conditions, and so on. The NTR is expanding the functions of rural settlements and their economic, social and cultural interaction. The development of the communications of the communities within a system of settlements provides for an effective division of labor, joint participation of the population in the regional organization of production and consumption, and an exchange of material benefits and services.

A combining of the labor of various economic sectors is expressed not only in the creation of agricultural-industry enterprises but also in the siting within the village of industrial facilities that technologically are not associated with agriculture. The nonagricultural functions of the village will be determined by the multifaceted role of the environment: the organization in the rural locality of large-scale recreational, tourist, therapeutic and health-promoting and sports activities, work on reproduction in the plant and animal kingdoms and the maintenance of the environment's ecological equilibrium, and so on.

The numbers of the rural population will be determined to a great extent by the circumstances for developing this branch of the economy. The industrialization of agriculture enables labor productivity to grow to a greater extent through a reduction in labor expenditure than through a growth in gross product per unit of area. Thus, during the years of the five-year plans (since 1929), labor productivity in agriculture rose more than 5.9-fold, while the gross product rose only 3.4-fold.³ According to one forecast, by the year 2000 the requirement for labor resources for agriculture will be cut to less than half, to 8-10 percent of all labor

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resources, the share of the rural population in this case being reduced only one-third, to 27 percent of the corresponding indicator for the country as a whole.⁴ The latter is connected with an expansion of nonagricultural forms of activity by the populace.

The migration process must be regulated by a system of measures and, in so doing, the regional distribution of labor resources ("labor reserves") must be considered and the movement of people into labor-short regions must be stimulated. Where there is a work-force shortage, for example, its recruitment should be combined with an accelerated pace in the construction of housing and of cultural and personal-services facilities, and, where it is in excess, by measures that provide employment for the population or that stimulate an outflow of people (by transplanted or balancing migration).⁵

Alterations in the lifestyle of the rural population occur because of changes in the nature of the work, social shifts, the development of informational media and increased social contacts. In particular, the industrialization of agriculture effects not only a reduction in extensive-type work places in the countryside but also rises in the level of special and general-education training of personnel, the content of the labor, the vocational composition of the population, and the regulation of intersector and interregional migration. The urbanization process is manifested in change in social standards, in socio-psychological trends and in the requirements that the rural population presents on working and living conditions, recreation and travel, and on the use of free time.⁶ Integration in the area of social relations, a further convergence of the living conditions of the rural and urban populations and so on are occurring. Such are the general trends that should be considered when solving problems of building up the countryside. The task consists in providing the best conditions for organizing people's vital activity, that is, work, household affairs, recreation and travel. It is these points that are being examined for the system that is being optimized. The criterion of optimality is minimized expenditures of social resources (the economic effect) with a reduction in the loss of off-work time in the production and nonproduction spheres while specific standards (the social effect) are being achieved. It is desirable to view the task of optimization by separate units (improvement of population distribution, the development of housing construction, and the expenditure of land on the buildup), using the above-named criterion and considering the consequences of the adopted solutions on the "cumulative" indicators of the system as a whole.

Under the systems approach the influence on the system being examined of factors that are exogenic to it (the development of interdependent activities and possible structural advances therein as a consequence of the NTR in the period being examined) must be considered. In particular, it can be concluded, on the basis of a number of background forecasts, that in the next 20-25 years the traditional design and technological solutions and the principal materials and methods for construction will prevail in the sphere of large-scale rural construction, with a gradual

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reduction in materials intensiveness, labor intensiveness and the weight of structural items.

Shifts in the level of transport expenditures that are associated with change in types of fuel and the large-scale development of new types of transport equipment will appear in the remote long term. Changes in the level of expenditures on fuel and power resources will affect the terms for price-setting not just in construction. The existing price scales may be used in a comparative analysis of both current and future expenditures during reconstruction of the village.

In evaluating variants for population distribution, the adopted procedure, under which losses from tearing down the housing inventory (during the relocation of small villages) is unjustifiably understated, should be rejected. The reason for this is that losses are computed according to the residual value of the housing, against which is counterposed, as the alternative, the capital construction of roads to these villages. A serious procedural error is concealed here. In the first place, losses from tearing down public housing of reparable age is 40-60 percent of the cost of restoring the buildings (depending upon the degree of their physical wear and the permanency of their construction). If it is considered that individual homes will be reproduced as they are amortized through the resources of the population, then the losses from replacing them with communal housing is practically equivalent to the costs of restoring these buildings. In the second place, by virtue of differences in the dates of erection, the degree of permanency of construction and the dates that repairs were made, the operating condition of the buildings even within one community are not identical, and the process of reproducing them is unceasing. This means that the periods for "self liquidation" of a village are figured unfairly, in accordance with an averaged degree of amortization of the existing housing inventory alone. And, finally, in evaluating expenditures for the construction of roads, their twofold role is considered--in the sphere of production and the sphere of services. Expenditures for road construction thus should be applied to one sphere or another in proportion to the volumes of freight hauling and of passenger hauling.⁷

The settling of the population in promising settlements should be examined in the context of the specialization, concentration and spatial organization of production. The development and siting of production facilities up to 1990 and in the longer term is determined by the appropriate sector scheme. From the standpoint of the land, the integrated, mutually coordinated siting of productive forces is decided by rayon layout plans and also by the on-site land-management plans of various enterprises, and promising communities are established. The conditions for settling the population are determined here by the historic, economic and natural peculiarities of the regions.

"Split-up" forms of rural settlement are characteristic of the Central Economic Region of the Nonchernozem Zone of the RSFSR. By way of example in problem-solving, let us examine these conditions. Here, the

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specialization of agriculture (flax and livestock production with milk production on the side, and the raising of vegetables and potatoes) calls for the wide use of small plots of plowland and of land with natural feed. And the historically prevailing pattern of settlement of the rural population is subordinate to the dispersed nature of the lands: there are small-scale settlements, small-group and large-group settlements, as well as dispersed settlements. One farm with an area of 10,000 hectares (45 percent of which is productive land) can include 15-20 small villages which are 2-5 kilometers apart. As research indicates, in many cases it is desirable to rebuild and expand existing livestock departments and to reequip them with machinery, including those located outside the promising settlements, and to organize feed production and preparation there.

The transportation ties of the communities with the workplaces and the services centers have been greatly complicated (no more than 15 percent of the settlements are closer than 10 kilometers to improved highways). The existing housing inventory of the small villages is represented mainly by individual houses, mostly by log huts in various stages of wear.

In many rural regions a workforce shortage and a relative aging of the population are being felt. The level of migration of the able-bodied population here greatly exceeds the average for the RSFSR. However, the size and "lack of promise" of a village has practically no effect on the level of migration from it if it has convenient communications with the services centers. The external ties of such a village seemingly extend beyond the framework of its social microcosm, eliminating thereby the traditional motives for migration. Sociological inquiries indicate that the longer a person has lived in a community, the less he is inclined to change his place of residence. Questioning of the able-bodied population of unpromising villages does not, as a rule, show a desire to relocate to a settlement if a higher level of cultural, domestic and municipal services for the village is proposed as an alternative.

Pertinent to the conditions described, the following courses for improving on-farm settlements are being examined: the relocation of "unpromising" communities (by stages, and also by facilities, that is, the settlement as a whole); the preservation of such communities with a strengthening of the amenities and the construction of roads to them; and the forming of regional structures of communities with the construction of roads to the structural centers, differentiated according to the prerequisites for production and services.

In the interests of saving resources and time (the criterion of optimality), a substantiated combination of these courses is desirable for typical conditions for relocation and production specialization of farms of the region being examined. The first course can be effected to a limited degree only where there are separation and isolation of the smallest settlements, which cannot effectively participate in the economic process and are characterized by an unfavorable demographic situation. In this case, the expenditures per person relocated at the initiative of the kolkhoz or sovkhoz and the organization of the necessary services in the settlement

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consists on the average of 5,000 rubles. The second direction is rational where the costs for laying roads are relatively low (for example, for a link to the production section). The last way proves to be not only the least capital intensive (a reduction of expenditures by 40-50 percent) but will allow questions of production concentration to be solved responsively as the appropriate prerequisites come into being, and it provides for adaptivity of the system being created to be relevant to the conditions of its functioning.

This course calls for the discovery of additional support points (from among the "nonpromising" communities) that possess the greatest production potential: personnel, livestock activities, building sites, land area, water sources and economic ties. "Clusters" of the remaining smallest settlements within a radius of 20-30 minutes' accessibility will be "plugged into" such support points, which play a structure-shaping role, depending upon the "pattern" of the population settlement and ties with the central settlement. In developing the road net and means of control and communication (which will provide for the modernization of production buildings, the manipulation of resources, responsive monitoring and accounting), production concentration begins to depend less upon a concentration of the population.⁸ Thus, the principle of a group system of population distribution (by the production-region criterion) that is formulated at the lowest hierarchical level has been laid down that will enable each small settlement to be examined not as an autonomous object but as a part of a "cluster," where services are brought to a structural center. The choice of additional support points, the use of nonstationary buildings and mobile types of servicing, and the development of the on-farm road net are called upon to bring workers closer to production, to provide the population with the necessary types of services, to intensify contacts both in the production and in the nonproduction spheres, and to strengthen these contacts and increase their regularity.

It is economically advantageous to produce some facilities, including those for production purposes, in a unified collapsible design: frame-and-panel structure or box module made of light, effective materials. Domestic and foreign practice testify to the desirability of using such buildings in pioneering and base settlements that are erected during the construction of linear-type structures (railroads, canals, pipelines and other structures), the assimilation of new lands, the exploitation of mineral deposits with short periods before depletion, and so on. Let us note that, with the still inadequate development of the services sphere in the village (in some places the population is supported by only one-half to two-thirds of the standard), the capacity of various servicing enterprises is underused as a result of the demographic situation that prevails locally. Therefore, along with an increase in the appropriate resources, there is the task of raising the level of their use. The use of such types of servicing that would consider the characteristics of the population distribution and the conditions, place, time and forms for presenting the services is required. The organizational forms here are varied. In particular, a system of school instruction can be constructed on the basis of the daily delivery of students from each "cluster" formed to the sovkhos

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or kolkhoz settlement (with free transportation) or the organization thereof of a school boarding house;⁹ for children of the youngest age (the nursery or preschool groups), an existing building can be reequipped during field-work periods, and so on.

In considering that, at servicing enterprises, the population itself is the object of a singular technological process, the consumers' time can be saved and operating costs of some services of selective demand can be reduced by offering these services to the home by the use of mobile means. Included here are: the delivery of commodities in accordance with orders and samples, preventive medical assistance "on wheels," motorized stores, mobile cinemas, library vans, dry-cleaning drops, KBO's [personal services combines] and others. In the first stages, where there are no roads, the maneuverability of these resources can be increased by using motor vehicles with high off-the-road capability. The household-services industry already is introducing new forms of service to the village. In particular, experience in Nechernozem'ye [Nonchernozem Zone of the RSFSR] villages in organizing integrated receiving points (KPP's) that go out to the field to take orders in accordance with a schedule approved by the rayon executive committee (the mix of services embraces more than 200 types) has proved itself well. The orders are carried out at specialized enterprises within the rayon production administration system (and also the interrasyon association system) and are delivered to clients with a guarantee of the date and the quality of the service carried out. A slow pace in creating such a system in conformity with the theory of large-scale servicing can lead to losses not only of waiting time (a criterion of optimality) but also to "client" refusals of the services and to unplanned migration of the rural population.

In the nonchernozem zone of the Central Economic Region the preparation and delivery to rayons of at least 2,000 complete units of automotive transport equipment, organization of the appropriate subdivisions, and expansion of road construction at the Tenth Five-Year Plan pace until 1990 and a certain reduction later (in connection with a substantial augmentation of the physical volume of growth) are required. Differentiation of the on-farm road net in accordance with the importance of the roads and their traffic load and the seasonality of use should determine the content of the work, including a shaping of the roadbed and the construction of a simplified road surface. This will enable the density of the on-farm vehicle roads to be increased 4-fold to 5-fold, bringing it up to 250-300 kilometers per 1,000 square kilometers of territory. The total amount of construction of on-farm roads and of trunk highways will, in so doing, be about 100,000 kilometers--30,000 of it by 1990. This strenuous program requires an outstripping pace of development of the supply and equipment base for road construction and of the interdependent sectors, and a mobilization of local resources. These include: the surveying and development of quarried materials, the use of initiative in road construction in conformity with the master scheme for developing the road net by the forces of sovkhozes and kolkhozes, with the ballast, binding materials, prefabricated reinforced concrete and machinery being delivered to them.¹⁰

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It is probable that the process of unplanned population migration from small villages will die off in the future because of the linkup with the unified transport network and development of the more intensive use of motor vehicles. The relocation of such settlements at the initiative of sovkhoses and kolkhozes should be accomplished within a short time and, as a rule, should cover the community as a whole. Upon relocating the residents, well-preserved log huts and paving-block homes should be hauled to the new place of settlement and, when necessary, overhauled and modernized with the installation of plumbing facilities. Where there are no roads, the buildings can be moved on a special sled trailer. The service life of log huts (and paving-block buildings) where the upkeep has been good exceeds the computed period 1.6-fold to 1.8-fold, enabling their useful life expectancy to be equated to similar indices for stone buildings.¹¹

In determining the structure of the rural housing buildup, the characteristics of both the housing to be built and the construction process should be considered. Housing characteristics are associated with the development of a socio-typological standard for rural housing and for the housing environment as a whole. Construction is governed by the spatial dispersion of the facilities, their remoteness from construction bases, the relatively small amounts of construction at each community, and the execution of many types of operations by the in-house method and by the efforts of the populace (or of individual builders). This will involve substantial regional fluctuations of socially necessary expenditures and the budget-estimated cost of housing construction. The task is reduced to an integrated consideration of three-dimensional layout and design solutions and of methods for erecting and operating housing while observing the requirements of the socio-typological standards and for reducing the time spent on the conduct of household processes and LPKh [personal subsidiary economic activity].¹²

Demographic and socio-economic conditions influence the choice of type of housing. This depends upon the specifics of the household processes and upon the fact that an increased demographic load per worker is not compensated for by the differentiated distribution of the combined product through public funds for consumption. The proceeds from personal subsidiary economic activity consists of an average of 24.9 percent (1977) of the combined budget of the family of the kolkhoz members, while for blue-collar and white-collar workers of sovkhoses, it is somewhat less. The residence of a family in one type of housing or another affects the amount of labor spent in LPKh and, as a consequence, the yield of the latter. In the future, the requirement for involvement of components of the natural environment in the family's household activity will be retained. This is manifest even today in the striving of families that live in sectional houses in the village to have an additional summer cottage at the garden plot (the "second residence" problem).

Rural construction should be correlated to the maximum with the economy's potential: with the resources and with the mastery of engineering solutions for the production of materials and for the construction work applicable to the housing typology and local conditions. In evaluating the

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economic feasibility of a housing buildup, the requirement for comparability in the constructional solutions for types of housing being compared, while satisfying equally with these homes the population's requirements and demands (the condition of equivalent satisfaction), should be dispensed with. Here the problem is posed of finding savings of resources that arise from the very specifics themselves of construction that has few stories: small building loads, structure cross-sections and building weight, the simplest of erection methods, and others. When evaluating the consumption of resources in construction having few stories, the reduction in the energy-intensiveness of producing the structural items should be considered.¹³ It is customary to consider that sectional housing is the most economical. Actually, when using identical structure, the budget-estimated cost of housing is 25 percent lower, for example, in four-story housing than in single-story housing. However, an integrated consideration of the factors that embrace even the interdependent spheres testify to the effectiveness of wide construction in the countryside of housing of few stories and with private plots.

The use in such housing of simplified footings, lightweight materials for load-bearing walls, aerated concretes, multilayer panels and large-dimension wooden, plywood and asbestos-cement members with effective thermoinsulating layers, and a reduction in transport costs by reducing the weight of the buildings will enable budget-estimated costs to be greatly reduced. A known reserve is the use in housing of few stories of local (autonomous and clustered) systems of sewerage and of heating apartments from automatic water heaters. This will yield a saving in the "startup" sums of capital investment in settlement-wide mains, boiler installations, aeration tanks and other head structures, without which a buildup of housing of three or four stories cannot be executed.

The advantages of construction having few stories should include the wider potential for using local building materials and for reducing the metals intensiveness and capital intensiveness of the construction product. This becomes possible with the use of small-scale mechanization equipment and the simplest of machines, which make it possible to dispense with lifting cranes and excavators.¹⁴ A definite benefit can be obtained by combining tractor and in-house work methods at the construction site. Thus, earth-moving operations, the laying of footings, the procurement of materials and auxiliary and subsidiary operations can be accomplished by using an unskilled work force of the developer itself (the sovkhoz or kolkhoz), especially in the seasonal interval between work in the fields.¹⁵ The importance of such an organization of affairs is especially important where rural construction projects are dispersed, the work front at the site is small, and labor resources (particularly for rural construction) are scarce.

The socio-economic aspects also are governing in choosing the type of housing. Because of the difficulties in performing LPKh, the amounts done by families that live in sectional housing prove to be 20-30 percent less than that of residents in houses with private plots (given an identical number and age composition, income level, social status and education of

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members of the family). Losses of output are probable here, the operating costs of which in the social sector amount to 240 rubles per year, and this, per estimated square meter of housing space, exceeds the saving that could be achieved by building sectional housing. Finally, when a family resides in a house with a plot, the demand for a "second residence" does not arise. This leads to a reduction in expenditure for developing the corresponding supply and equipment base for construction, and a saving of land resources and of the time spent traveling. Naturally, the demands of rural residents are not identical. Therefore, where there is a construction base, sectional housing can be stipulated for small-families that do not perform LPKh and have no requirement for it.

The development of individual and cooperative construction requires special attention. The working out and improvement of stimuli for promoting it, a maximal combining of state, economic-accountability and personal interests, and the formulation by rural residents of the appropriate aims, orientation and preferences are necessary. The individual house with a plot not only meets more completely the specifics of the countryside but it has advantages over the city that cannot be compensated for in any way-- it satisfies the requirements for living once expressed by Le Corbusier: "Air, sound and light." The advantage is that such a house can "grow" as the family grows and its opportunities and requirements expand. In this case, the prerequisites are created for a large kinship family to live under one roof, for which separate apartments would be required under other circumstances.

The terms for granting credit and for providing supplies and equipment for builders obviously must be differentiated for various farms, depending upon the economic tasks (including the stimulation of resettlement), the requirement for personnel, opportunities for the use of local resources, and the organization locally of the production of construction materials and structure. Experience that has been gained in the country in organizing individual construction in sovkhoses and kolkhoses should be utilized. Its results should legitimately be viewed as the results of a social experiment already performed. The effectiveness of propagating the appropriate experience depends upon the comparability of the original and the reproduced conditions. In particular, very few log huts are being moved into settlements from nonpromising villages.

In accordance with the CPSU Central Committee and USSR Council of Ministers decree, "Further Development of the Construction of Individual Housing and the Retention of Personnel in the Village," that was adopted 19 July 1978, preferential terms for granting credit have been established everywhere for demobilized soldiers, newlyweds and young specialists, for farms that are experiencing severe work-force shortages, and for workers of widely practiced trades who have transferred to these farms for work. Credit is issued on the basis of 0.5 percent per year with liquidation in 20 years. In so doing, half the sum of the credit is repaid by the sovkhoses or other enterprises. Countrywide, an increase in the volume of individual construction by just 20 percent annually would save a billion rubles.

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In order to develop a rural buildup based upon housing having few stories, construction-industry bases that are oriented toward the use of light-weight structure and local building materials must be formed. Industrialization and maximum prefabrication of buildings will determine the general trend in construction. It will be developed along the path of creating rural-construction and housing-construction combines by organizing a company for individual construction. This trend should be combined with an orientation to the wide use of local resources and small-item materials, and the production of structure in casting yards by the in-house method, using the forces of sovkhoz and kolkhoz construction brigades and of the builders themselves. It is important to plan that the market inventory be saturated with the necessary materials, articles and semifabricates, and also that they be produced locally. Fully prefabricated construction based upon the use of wood and wood-processing waste has broad prospects. In highly developed capitalist countries the production of housing based upon wood and wood-processing waste has been transformed into a self-supporting branch of industry. Thus, the share of wooden buildings in housing construction has reached 60 percent in the USA, 50 percent in Canada.

Wood remains the most widely distributed building material. The share of wood-housing construction at the start of the Tenth Five-Year Plan was about 30 percent of the total amount of housing construction, of which only 7 percent went for standard factory-made housing. In accordance with the decree of the CPSU Central Committee and the USSR Council of Ministers, "The Further Development of Factory Production of Wood-Panel Housing and Sets of Wooden Parts for Houses Made from Local Materials, for Rural Housing Construction," that was adopted in November 1979, tasks were set for a number of ministries and installation-type construction organizations to provide for the production of factory-made wooden homes totaling up to 7.1 million square meters of total housing space by 1985, and up to 11 million square meters by 1990, and also of sets of wooden parts for houses with walls made of local materials for up to 8.5 and 12.2 million square meters, respectively, of total housing space per year.

In order to satisfy the demand for individual construction, the selective logging of trees, including sanitary felling and clean-up cutting, will be adequate. Although the total wood consumption in the country will rise, it is not superfluous to recall that wood is a renewable resource that is reproduced on a planned basis over the vastest of the country's forest-covered regions.

In many regions, especially those that are remote, monolithic housing construction, using industrialized formwork systems and the delivery of ready dry-mixes to the construction site is economically feasible. The advantages here are: minimum cost for a supply and equipment base for the construction work (including the mechanization equipment), a reduction in the consumption of materials, and a reduction of labor expenditure, based upon a combining of the processes of hardening the concrete and erecting the walls.

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Optimization of solutions for the withdrawal and use of land while developing rural settlements is based upon a reduction in the sizes of the areas that are taken out of agricultural use. A peculiarity here is the fact that the land in a rural settlement is not only a "spatial operations base" but is also the main means for the production of the agricultural output by LPKh--at the plots in front of the apartments. While, during the buildup of sectional houses, the sizes of the developed land prove to be but a fraction of the sizes of a buildup of housing with plots, the productive properties of the land are not used in this case. It drops completely out of circulation, and the families that reside in the sectional housing are allocated land plots outside the settlement additionally. During a buildup of housing with plots at the apartments, these are used intensively for obtaining agricultural output (kitchen gardens, berry patches, truck gardens, hotbeds and others). As a result, total land consumption proves to be less than during a buildup of two-story or three-story sectional housing. Moreover, in the first case the quantity and value of the output obtained are increased, and the time consumed in its production is reduced.

In the process of reconstructing the village an excess in the requirement for land for developing the residential areas of villages over that which is released in the small villages will be observed. In particular, for the region being examined, this excess will be 40,000 hectares. A reserve here is to find unused, vacant land in settlements and to use rational methods in the rebuilding, layout and development of the village that will permit the requirements for new land withdrawals to be reduced by 10-12 percent.

The management of social development presupposes the conduct of social experiments that will enable the "human factor" to be forecast, correlating with this the parameters of economic development and the sequence and content of the fundamental operations. It is necessary, in our view, that the experimental operations embrace not only individual settlements and farms, but also rural administrative rayons, which, for example, are being initiated in the Lithuanian SSR (Vilkavishskiy Rayon), the Estonian SSR (Vil'yandinskiy Rayon), the Moldavian SSR (Kalarashskiy Rayon) and other places. The topic of the research should be the forms and prerequisites for the active functioning of small villages, the construction of on-farm roads undertaken at the initiative of the kolkhozes and sovkhoses in correlation with the highway network, a system of measures for promoting individual (cooperative) construction, and an economic mechanism in the contract-construction system that will provide for a reduction in the budget-estimated cost and the materials intensiveness and labor intensiveness of the facilities being erected. In light of the CPSU Central Committee and USSR Council of Ministers decree, "Improvement in the Planning and Intensification of the Effect of the Management Mechanism on Raising Production Effectiveness and Work Quality," that was adopted in July 1979, in our view, coordination of the operations for transforming the countryside should be concentrated in a single administrative organ--for example, in the form of an interagency council. Its main tasks should be: the integrated, mutually correlated solution of questions of the intensification

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of production, the development of a social sphere for the village and for its infrastructure, the effect on demographic processes (particularly migration processes), the choice of priorities for fundamental operations both at sovkhozes and in the kolkhoz sector, and the development and testing of a system of measures for raising capital investment effectiveness. The council's solutions that have been concurred in should be considered in making up sector plans and in area planning for large regions.

FOOTNOTES

1. Despite the possibility of producing food components based upon the achievements of high-molecular compound chemistry and new methods for obtaining biomass, agriculture (supplemented by fishing and marine cropping) will remain in the foreseeable future the main source for meeting the requirements of the population for food and of industry for several types of raw materials.
2. K. Marx and F. Engels, Soch. [Works], Vol 13, page 7.
3. Although, as F. Engels noted, "yield of the land can be raised indefinitely by the application of capital, labor and science" (K. Marx and F. Engels, Soch., Vol 1, page 563), there is at each stage a limit to the effectiveness of added capital investment in the land. Thus, over a period of many centuries, no sharp increase in the yields of cultivated crops has been observed.
4. The share of agricultural workers (including those hired) in the total able-bodied population is, for example, 5.9 percent in the USA and 7.7 percent in Canada, the share of workers in branches that constitute "agribusiness" in the USA exceeds this indicator 2-fold, while in Canada one-third of all workers are engaged in agriculture and the branches of the economy that serve it.
5. Prescriptive (directive) forms for managing resettlement can occur when this is induced by operational necessity (land reclamation, road construction and so on) or by the danger of further residence in a given locality (places subject to flooding, the effects of adverse physico-geological processes, and so on).
6. The "phenomenon" of urbanization, which is expressed in the rapid growth of cities, is counterposed by the process of deurbanization which, apparently, will be intensified. It is manifested in the resettling of city residents in a rural locality and their involvement in the attributes of the traditional rural life style in the sphere of their vital activity. For example, the tie with the land, closeness to nature and work in the open air are viewed as fixed values of the vital activity. While migration of the rural population to the cities is double the reverse flow right now, the number of people being resettled in the countryside is still quite impressive--1.5 million annually.

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7. Economic analysis does not exclude an accounting of the "human factor"--the influence of decisions adopted on the basis of the strivings of people and the motives for migration.
8. The example of the first Hungarian socialist city, Dunaújváros (New Dunay City), and also a number of other new cities of the MNK [Hungarian People's Republic] that are sited in a rural locality where there are industrial enterprises with a view to using a work force acquired from nearby villages, indicates the possibility of using a dispersed rural population at large industrial enterprises. The labor resources of small villages are widely used in developing the road net in the ChSSR [Czechoslovak Socialist Republic] and the GDR.
9. One of the ways to consolidate contingents of pupils and to raise the quality of teaching is the construction of school villages in a rural locality. An example of such a solution in our country is the school at Artek; in foreign practice, there is the network of excellently equipped boarding schools in the Republic of Cuba.
10. The given operations can be carried out in accordance with an appropriate program with correlation of intersector ties and deliveries. It should be considered that achievement of the necessary density of roads will enable transport costs in the production sphere to be reduced and capital investment effectiveness in agriculture to be increased by about 25 percent.
11. A number of foreign companies that make wooden prefabricated houses guarantee an operating life of 99 years for them.
12. The concept "everyday matters" embraces the whole sphere of everyday existence of the individual outside the production sphere as an aggregate of daily actions connected with nonproduction--material and mental--consumption, and it affects mainly the area of personal and family life. The conduct of LPKh [personal subsidiary economic activity] is viewed unfairly as the execution of everyday living processes. LPKh creates part of the aggregate social product, thanks to which the family's budget is expanded, the seasonality of work is smoothed out, and a majority of family members take part in the work, that is, as a result, the level of involvement of human resources in the production sphere is raised. LPKh has no little social significance also as one of the forms of labor education of juveniles in the family.
13. For example, reinforced-concrete structure is marked by high energy consumption--the energy spent on its production, taking account of the preceding expenditures (preparation of the raw material in the cement industry, the roasting and grinding of the clinker, and other operations) being 15 percent higher than for brick structure.

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14. The striving to save is, for example, inducing farmers in the USA, even where roads are good, to do 20 percent of all agricultural construction by their own efforts.
15. For example, builders of the BAM [Baykal-Amur Mainline] are assembling one-story housing in 1-2 days, without the use of cranes, from small wooden panels that are produced by the housing construction combine in Nizhneudinsk.

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REGIONAL DEVELOPMENT

TERRITORIAL ASPECTS OF OVERALL ECONOMIC DEVELOPMENT PLAN ANALYZED

Moscow VOPROSY EKONOMIKI in Russian No 1, Jan 80 pp 71-77

[Article by Yu. Dmitriyev and A. Zenkovich, Vladimir: "Territorial Aspects of the Overall Plan for Economic and Social Development: On the Example of Vladimirskaya Oblast"]

[Text] In the decree of the CPSU Central Committee and the USSR Council of Ministers on the perfection of the economic mechanism as one of the measures which guarantee an increase in the efficiency of production and the quality of work, the development of plans for economic and social development is envisaged in the territorial-administrative regions. The realization of these plans will make it possible to attain the comprehensive utilization of the available resources of the individual regions of the country on the basis of "the full and free development not only of local features, but of local initiative, local innovation, the diversity of paths, methods and means of the movement toward a common goal".*

The increase in the efficiency of territorial and sectorial division of labor promotes an increase in the contribution of the individual territories to the solution of production as well as social problems of the national economy.

Overall economic and social development plans in territorial section were worked out in several phases. In the beginning they encompassed some of the largest enterprises of the individual territories, then spread to small, medium, and large cities. At present the elaboration of such plans is carried out for large territorial-administrative units--oblasts, Autonomous Soviet Socialist Republics, territories (kray), territorial production complexes, and others. The experience of the realization of overall plans of economic and social development shows their great effectiveness from the standpoint of the national economy.

*V. I. Lenin, "Collected Works," Vol 36, p 152.

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In Vladimirskaya Oblast the first plans of social development were worked out by the collectives of the Vladimir Tractor Plant imeni A. A. Zhdanov, the Kovrov Excavation Plant, the Kirzhach Krasnyi Oktyabr' Plant and the Murom Plant imeni S. Ordzhonikidze. Subsequently such plans were disseminated to a significant extent in enterprises and organizations of other sectors of the economy.

After the plans of the social development of work collectives came to be worked out, there arose the question concerning the necessity of their territorial coordination right up to individual cities. The contemporary city is a complex socio-economic organism, a complex of interrelated industrial factories, transportation, construction, cultural and domestic service, educational and scientific and other enterprises, organizations and institutions. Every city has its own peculiarities, which have developed under the influence of different factors. However, regardless of the specific characteristics of a city, it is an integral system, and the coordinated development of its varied spheres and subdivisions can be secured only on the basis of a unified city-wide plan.

The most widespread form of the planning of cities are general plans, developed on the basis of architectural-spatial decisions. However, they are primarily plans of city building, have basically an architectural and plan orientation and, naturally, differ from the program economic and cultural development of the city. Questions of a socio-economic character are reflected in these plans partially, only to the extent of the necessity of solving the main task--the planning of the architectural and spatial environment. Therefore, general plans in their present form cannot be regarded as a mechanism for the administration of a city.

At the present time, plan tasks are brought to the cities only for enterprises directly subordinated to the Soviets of People's Deputies. Such an approach does not encompass many aspects of the production and cultural and domestic services life of the city. The industrial and transportation enterprises, the construction and other organizations located in the city receive these tasks from the superordinated economic organs.

In our view, it is necessary to develop a plan document that would reflect the development of the entire complex economic and social structure of the city.

The first overall city plans of economic and social development were composed in Leningrad. This initiative was given wide dissemination in various regions of the country. Thus, in Vladimirskaya Oblast the first city-wide overall plans were developed in Vladimir and Kovrov, and also in Aleksandrov, Murom and other cities. In the city committees of the party, councils on economic and social planning were created to provide guidance in the preparation of the overall plans. The composition of the councils included workers of party and Soviet organs, representatives of industrial enterprises, transportation and construction organizations, all main branches of the service sphere, scientific staff members of

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institutions of higher education and scientific research institutes, and so on. Within the council, work groups or commissions were organized, each one of which concerned itself with the preparation of proposals in regard to the appropriate parts of the plan.

In the stage of pre-planning preparation, the socio-economic development of the city during the preceding period must be thoroughly analyzed. For this, several sources of information may be used. Of great significance, in particular, is the carrying out of surveys and sociological research. Comprehensive analytical work makes it possible to form an integral concept of the city as an object of economic and social planning. In so doing, not only the positive, but also the negative aspects of the development of the economy of a given territory are exposed.

In recent times, the social orientation of state plans has deepened. In this the increased possibilities of the developed socialist society are clearly reflected. As was noted at the 25th CPSU Congress, "new possibilities are being created for the solution of the basic socio-economic tasks set by the Program of the Party, by the last congresses. This has to do, above all, with a further increase in the prosperity of the Soviet people, the improvement of the conditions of their work and everyday life, a significant advance in health care, education, culture--everything that is conducive to the formation of the new man, the comprehensive development of the personality, the perfection of the socialist way of life".

One of the main tasks in the elaboration of overall plans is the securing of the maximum possible conformity and balance in the development of sectors and subdivisions of material production and the non-productive sphere--which constitute a unified city-wide socio-economic organism. In the plan it must be clearly shown how, in the conditions of a concrete city, the highest goal of national production under socialism is put into practice--the fullest satisfaction of the material and spiritual needs of the people.

The basic sections of the overall plan include questions of economic development and scientific-technical progress, labor resources and their utilization, increase in prosperity and an improvement in the health care of workers, development of education, culture and professional training of cadres. Moreover, it contains a complex of measures on communist education and the development of the socio-political activeness of the workers.

Of great importance in the city-wide plan are questions of the economy and, above all, of industry as the main city development factor, which exerts great influence on the structure of employment, the social and demographic composition of the population, on the development of the non-productive sectors, and so on.

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In every city, industry is represented by enterprises of different departmental affiliation. In Vladimir, for example, machine building and chemistry are the leading industries. They account for more than 75 percent of the total volume of industrial production. At the present time, the enterprises of union, union-republic, and republic ministries and departments receive plan targets from the superordinated economic organizations. In the territorial section, and not only by cities, but also by oblasts, krays, and autonomous republics, indicators of industry by these ministries are not planned. In the conditions of the sectorial principle of administration in industry, this procedure for planning material production will apparently not be changed.

As practice shows, many questions of the social planning of cities have not yet been solved. There is no clear-cut interaction between the union ministries and the territorial planning organizations; the activity of local planning organs, as a rule, is limited to a narrow range of questions connected with the development of the local economy; the overall planning of the economic and social development in oblasts, krays, autonomous republics, and cities has not assumed the necessary scope.

At the November (1979) Plenum of the CPSU Central Committee, L. I. Brezhnev noted that "the socialist economy is unthinkable without the consolidation of the centralized principle. At the same time, in politics, as in economics, we need a centralism which is democratic, which opens up broad scope for initiative from below--initiative on the part of collective and state farms, enterprises and associations, local organs".

Enterprises in Vladimirskaya Oblast which have local significance include quarries and stone-processing plants. Large quarry administrations--the Kovrovskoye and Sudogodskoye administrations, the Kostenetskiy stone processing plant and others operate on the basis of the limestone deposits in the oblast. The basic forms of their production are limestone rubble, stone, construction and polishing lime, limestone meal for agriculture. With regard to departmental subordination, the Kovrovskoye and Sudogodskoye quarry administrations belong to two republic production administrations of the Ministry of the Construction Materials Industry of the RSFSR, the Dobryatinskoye administration is a part of the oblast production association "Vladpromstroymaterialy" [Industrial Construction Materials of Vladimir Oblast], the Kostenetskiy stone-processing plant is one of the economic units of the administration of the Gor'kovskaya railway. In the composition of the production manufactured by these enterprises, construction materials predominate, which--regardless of the departmental affiliation of the enterprises--are sold through the administration for supply and marketing of the oblispolkom. Rubble, limestone, brick, facade brick, and other building materials are used primarily in the oblast.

It seems to us that it is impossible to plan the development of production in this sector outside the relation with the needs of the oblast, as this is actually taking place. For example, the raw materials base of

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the Kostenetskiy stone-processing plant has at its disposal a considerable supply of limestone which makes it possible to produce more rubble than is manufactured at the present time. However, the administration of the Gor'kovskaya railway, proceeding from departmental interests, does not take the necessary measures to increase the output of stone-rubble production, for which there is great demand in the oblast. During the past 6 years, the production of rubble essentially has not changed: in 1973, 360,000 cubic meters were manufactured, and in the plan for 1979 400,000 cubic meters of rubble are envisaged.

It is evident that it is expedient to introduce fundamental changes in the planning procedure for those sectors of the industry of construction materials which are closely connected with the development of the intra-oblast economy. For this, the production of building materials must be represented in full volume in the territorial plan at the level of the oblasts, krays, and autonomous republics.

In Vladimirskaya Oblast, the peat industry has experienced broad development. The organ which coordinates the activity of its enterprises is the production association "Vladimirtorf" [Peat Production Association of Vladimirskaya Oblast], which is subordinated to the RSFSR Ministry of the Fuel Industry. During the years of the 10th Five-Year-Plan, the extraction of peat by the association amounts to over 13 million tons. A large consumer of peat is the Vladimirskaya TETs [Heat and Electric Power Station]. Moreover, peat is used for the production of highly-concentrated peatmineral-ammoniac fertilizers for agriculture, for the production of neutralized peat blocks, and so on. The entire production of the peat industry is directed toward the satisfaction of intra-oblast demands. Meanwhile they receive inadequate consideration in the state plan for the development of this industry. An analogous situation is observable in forestry, in the meat and dairy industry.

The plans for the development of the food industry, too, are in need of greater economic soundness. The oblast and kray plans envisage only targets for oblast or kray administrations of this sector, which bring together combines and bread-baking plants, factories producing macaroni, canned vegetables and fruit, and other articles. However, besides them there are still food enterprises connected with intraoblast raw materials resources or intraoblast sale of produce, the plan targets for which are not included in the territorial state plans (breweries and the production association of the starch-syrup industry).

At the November (1979) Plenum of the CPSU Central Committee it was emphasized that "side by side with an increase in the responsibility of the ministries and departments, the planning and trading organs in the center, the production of consumer goods should be much more reliable, and what is the main thing--local industry, consumer cooperatives, the Soviets and their permanent commissions should show initiative in their work. This will make it possible to make better and more efficient use of local raw

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material, especially in the remote regions." Important and fundamental measures in this regard are determined in the decree of the CPSU Central Committee and the USSR Council of Ministers on the improvement of planning, in which appropriate obligations of ministries and departments are envisaged with regard to the development of the drafts of plans in the territorial section. The councils of ministers of the union and autonomous republics, the executive committees of the kray and oblast Soviets of People's Deputies are charged with the composition and confirmation of the composite five-year and annual plans for the production of the local building materials and the output of consumer products. Such a restructuring in the practice of planning will make it possible to include in the state plan for industry, on the level of oblasts, krays, and autonomous republics, indicators for the development of the majority of its sectors, which are closely connected with their many-sided and dynamically developing economic life.

In Vladimirskaya Oblast consumer goods are produced by 245 enterprises. During three years of the 10th Five-Year-Plan, additional reserves were found and articles in popular demand amounting to 100 million rubles were produced. In light of the tasks set by the party with regard to increasing the output of consumer goods, it is necessary for the targets in regard to their production to be reflected in the state plans at all territorial levels. In the plans brought forth to the oblasts, krays, and autonomous republics, they are represented to an insignificant extent at the present time. For example, the production of sewing and knitting enterprises of republic subordination is not considered in the plans. This also applies to the development of the glass and textile industry, the production of cultural and everyday services items produced by enterprises of the union republics and departments.

In our view, fundamental changes are required in the system of indicators of the territorial plan for industry on the level of oblasts, krays, and autonomous republics. Almost all of the sectors which have a close connection and interrelationship with the economic life of the territory must be represented in the state plan. The realization of these changes will not only be a definite contribution to the perfection of the organization of territorial planning, but will also make it possible to secure its fuller combination with sectorial planning. At the same time, it is possible, the necessity will appear to make partial changes in the subordination with regard to individual sectors and enterprises. It appears to us that the time has come to examine the question of transferring some enterprises, which are connected with intra-oblast requirements, from republic subordination into economies under the jurisdiction of oblast and kray executive committees and the councils of ministers of the autonomous republics.

The problem of perfecting territorial planning also applies to agricultural production. In conformity with the decisions of the March (1965) Plenum of the CPSU Central Committee, stable plans for the purchases of grain and the basic products of livestock raising.

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However, lately this principle of planning is being violated. Side by side with the firm plans for the oblast, so-called aggregate volumes of purchases, various additional targets are being established, the practice of frequent and unfounded changes in them has developed. As is well-known, at the Plenum of the CPSU Central Committee (July 1979) there was talk about the liquidation of the multiplicity of plans; the Plenum decided that, beginning with the 11th Five-Year-Plan, a single stepped-up, but realistic plan is necessary for the purchases of agricultural products for five years with a breakdown by years.

Plans for the sale of agricultural and livestock products to the state are established on the basis of the territorial principle--by republics, krays, oblasts, and rayons. Collective and state farms work out plans for the various forms of agricultural production, determine the structure of sowing areas, crop capacity, the livestock of all types of cattle, its productivity, and so on. After this, the planning and agricultural organs put together a composite plan for the development of agriculture by regions, and then on their basis--by oblast, kray, and autonomous republic.

In connection with this, the operative system of planning capital investments in agriculture, too, requires fundamental changes. The planning in this sector, in our view, must be based on the territorial principle. The program of capital construction, as was noted at the July (1978) Plenum of the CPSU Central Committee, is the most important component part of the agricultural policy of the party, and that is why it must be stipulated in the state plans by autonomous republics, krays and oblasts. It is clear that it must also be determined in the plans for rayons. As a result, the territorial aspect of planning of agriculture will be complete and full.

The territorial aspect of the planning of motor transportation and road construction, too, requires perfection. The transportation administrations of the Ministry of Motor Transportation of the RSFSR carry out significant passenger transportation; with every year the net of intra- and inter-city bus routes is expanding. Meanwhile, indicators for the development of motor transportation are absent from the state plan that is brought forth to the krays and oblasts.

In economic literature the questions of changing the operative procedure for planning capital investments in regard to the sectors of the non-productive sphere have frequently been examined. The basic content of the proposals came to the fact that planning should be carried out in accordance with the territorial principle. Thus, D. Khodzhayev writes: ". . . It can be proposed that in the final analysis we must strive to go over to the planning of capital investments for the development of the

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non-productive sphere on the basis of the territorial principle." However, the author continues, "the question is, when, in what phase of economic development such a transition will be substantiated."*

Capital investments for housing construction continue to be apportioned along the line of ministries and departments. For example, in 1978 in Vladimirskaya Oblast the local Soviets accounted for only 18.7 percent of these allocations. The organizational structure of capital construction of the socio-economic complex of the oblast as a whole is characterized by departmental and territorial dissociation, the absence of the necessary concentration of material, financial and labor resources, a clear-cut gradation of the prerogatives of every production and territorial link in the utilization of capital investments. As a result, one observes the dispersion of the available capital resources, a multitude of small enterprises with low efficiency is being created, in a number of cases there is an increase in the disproportion in the ratio of the relative weight of individual sector groups of the non-productive sphere and simultaneously the aggregate overall effect from its development is lowered.

The financing and the material-technical securing of capital construction of the non-productive sphere on the scale of the oblast as a whole, for the above-mentioned reasons, also do not have as yet systematic character; the means for capital construction, which are directed toward common social goals, are expended from different sources (the social fund of enterprises, means of the Soviets of People's Deputies, public organizations, state budget financing, means of the sectorial ministries of the non-production sphere, enlisted funds of enterprises of the material sphere, and so on). This leads to the dispersion of capital investments, the creation of small enterprises of single purpose, the "cross" character and duplication of investments.

The utilization of the financial resources of capital construction of the social non-productive sphere lacks unity. The local Soviets, in particular the organs of the city economy, carry out the financing and construction of only part of the projects of city-housing and civilian designation, which leads to the unsystematic building of the cities, and within individual city agglomerations--to very significant differences in the levels of housing supply, everyday services, public utilities, and social and cultural services of the individual microrayons. As a result, with a significant volume of expenditures, for example, for housing construction as a whole throughout the oblast, the disproportions in the level of the supply of housing in individual cities are very significant. The enterprises of the material sphere located on the territory of city agglomerations frequently use city engineering and technical installations, drinking water for the needs of production, and so on, almost free of charge. It seems to us that the solution of these problems must be carried out in stages.

*PLANOVoyE KHozYAYSTVO, No 8, 1976, p 48.

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The questions of the rational use of labor resources and natural resources are important questions in regard to the perfection of the territorial planning at the level of krays and oblasts. At the present time, all possible measures to preserve the environment are being carried out in enterprises of industry of union and republic subordination. The basic ones among them must be included in the indicator of the state plan on all territorial levels.

The overall plans for the development of cities, oblasts, Autonomous Soviet Socialist Republics, krays and territorial production complexes (TPK) signify a new, higher level in the administration of all aspects of their production and social life. They provide coordination of the practical activity of party and Soviet organs, trade unions, Komsomol and economic organizations. These plans will make possible a more purposeful organization of work in regard to the fulfillment of the tasks set by the party regarding the further development of industry, capital construction, acceleration of scientific-technical progress, increase in the efficiency of production, and a further rise in the material wellbeing and cultural level of the people.

With every year the sphere of the dissemination of territorial plans is expanding more and more. In "Basic Directions for the Development of the National Economy of the USSR for the Years 1976-1980," it is shown that the perfection of territorial planning is one of the important measures: "To improve the overall planning of economic and social development in enterprises, in associations, in rayons and cities." With such a statement, the character and content of the work of the local planning organs changes in many respects. It is necessary to bring about an essential change in their functions and rights, to determine the principles of their interrelationships with the organs of sectorial planning and administration. In the oblast and kray planning commissions the activity of, above all, the departments of territorial planning and industry will undergo a change in regard to volume and content. Questions of the work of the city planning commissions require comprehensive examination. The central planning organs must increase their methodical assistance to the local planning organs.

The further perfection and development of the principles of organization and the methods of territorial planning on all levels are an objective necessity of the contemporary stage of development of the socialist economy, one of the most important links in the solution of the tasks set by the party in the increase of the level of the planned guidance of the national economy.

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