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# PLANNING OF INDUSTRIAL ENTERPRISES: BASIS FOR THEIR LOCATION 1/

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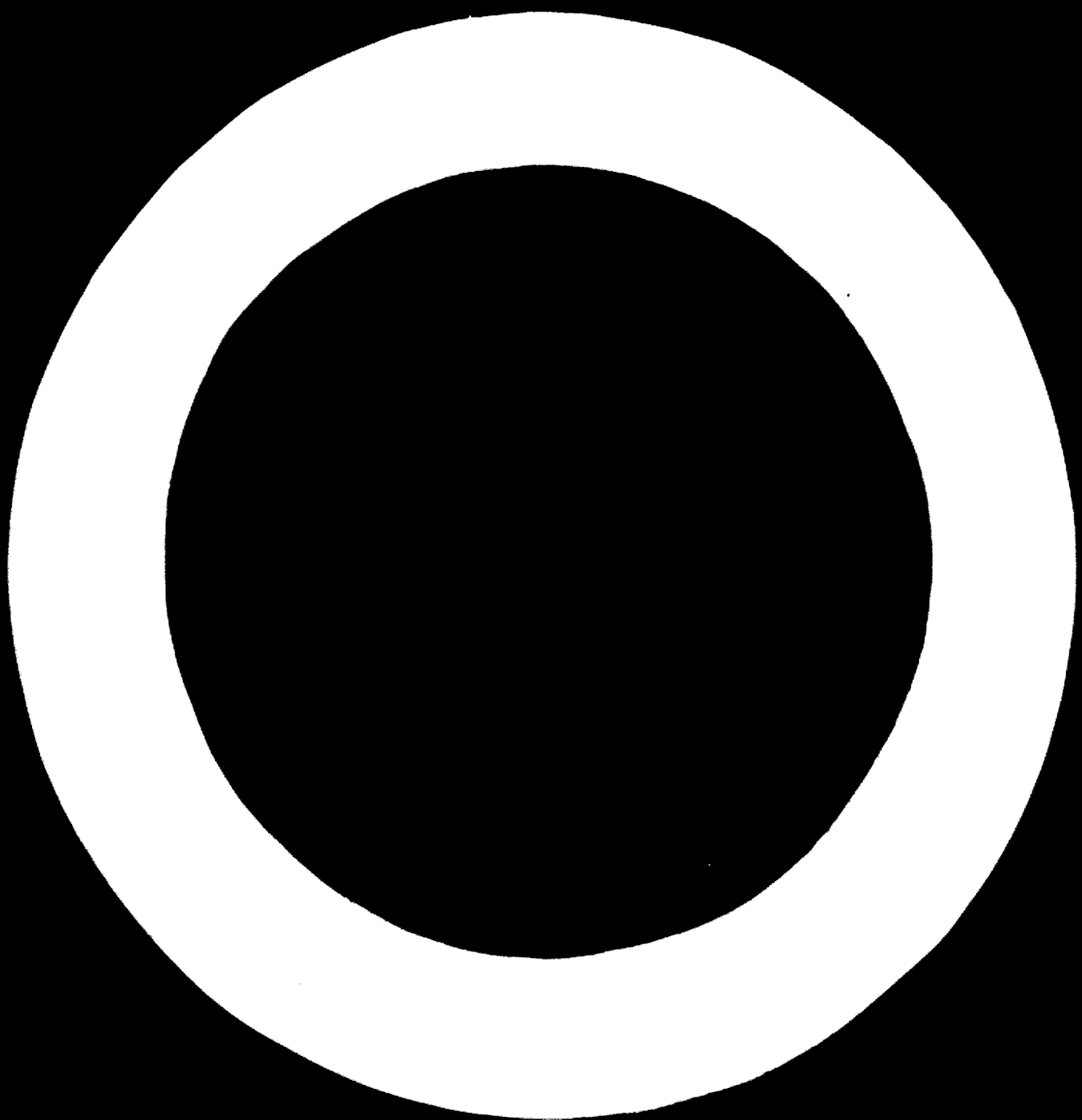


## Contents

INTRODUCTION

The problem on regional development and changes in the national economy territorial pattern of separate countries refers to the most important problems of productive forces location. At present many scientists of different professions analyse problems of the production location. Special attention is paid to the location of industry. The industry is the leading branch of the national economy and, to a considerable extent, determines the location of other branches, the national economy pattern of separate regions and the territorial organization of the whole social production. Moreover, it is easier to influence the location of industry than that of agriculture or service.

The location cannot be considered apart from the planning of the production development. The total volume and location of production are substantiated at the same time. The conditions of production and location are closely connected between themselves; the factors causing them constantly interact and jointly influence the efficiency of production.

It is generally known that the rational location of industry as well as other branches of the national economy should be based on the most complete use of all the possibilities to increase the productivity of social labour. The economical science is to play essential role in developing such a location.

The theoretical and practical problems advanced at present in the foreground deal with the improvement of methodology of planning under the conditions of the spreading scientific-technical revolution, optimum combination of centralized planning and scientific forecast with economic independence and initiative of enterprises and other primary economic systems. Due to this fact, a further thorough development of theoretical and methodological bases of the industrial location is necessary.

The planning of the national economy requires not only a study of general laws of the industrial location, interactions and dependences of separate factors and conditions which influence the location but also the development of quantitative-definite perspectives of the rational location of enterprises, industry branches and territorial production complexes, being formed depending on a concrete combination of local economic, historic

and natural-geographic conditions. Otherwise, it is necessary to choose and substantiate the most effective solutions to the problems on the industrial location which follow from the general demands of economic laws and their specific features under these concrete conditions.

At all stages of social development the location of production depended upon natural resources and conditions; however, as far as the productive forces are being developed this dependence gradually diminishes. That is promoted by the improvement of transportation of raw materials, materials and energy. Advances in science and technology decreasing the dependence of manufacturing process from natural sources of energy and labour increase this trend. At the same time the conditions and factors of economic and social nature begin to be of more importance.

Consequently, the methods of planning and criteria of different industrial productions location should be flexible and improved with the development of production, science and technology which introduce essential corrections into the principles and practice of the industrial location.

ABOUT METHODOLOGICAL BASIS OF INDUSTRIAL
LOCATION PLANNING

As is known, the methodology of planning is a complex of propositions and principles which are attributed to the theoretical grounds of making plans, the methods of their scientific substantiation and the measures to ensure the fulfilment of target figures. An important condition of true scientific methodology of planning is that all internal and external objective factors of the economic development should be taken into account. One of the main tasks of industrial planning was always and remains, from the point of view of society, the investigation of effective ways and methods of the most rational distribution of sources and the ensuring of necessary proportionality in the development of the national economy.

The problem of the industrial location has two aspects global (regional) and local. They are closely connected but have essential differences. The first implies the choice of a region for location of these or those productions. It is the most important aspect since the way of the territorial location of industry in a country, the efficiency of the national economy pattern and interregional relations depend upon it. The choice essentially influences the indices of efficiency of the whole social production. The second aspect implies the choice of a definite place and grounds for building enterprises within the region chosen. This choice is attributed both by general and particular conditions and factors.

There are enterprises whose location is always more or less strongly connected with resources of raw materials, for example, extraction of low-caloric types of fuel as well as the branches of industry which are based on processing of not-transportable farm raw materials. The planning of these branches' location is reduced to determining the volumes of resources, needs and the choice of location grounds of concrete enterprises. Some branches should, by nature of production, be obligatorily located in the areas of produce consumption. In particular, these are branches of attendance and everyday service, position of which increases. However, in the major branches the industrial location is very complex, requires various conditions and factors to be taken into account and the appropriate calculations to be made.

The branch location envisages a distribution of necessary volumes of production of this or that product according to a territorial principle and therefore it includes not only the construction of new enterprises but also the improvement in the use of industrial capacities as well as the expansion and modernization of the operating enterprises. This is performed with regard for economical conditions being general for a region and the whole country as well as with regard for social-economic and political problems.

The most important principles of the effective location of industry are:

- immediate putting into operation and economic turnover of the natural resources, which are most rich in content and profitable according to exploitation conditions;
- all possible approach of production to sources of raw materials, fuel, energy or to areas of product consumption;
- rational specialization and complex development of economics on the basis of effective use of resources, industrial capacities and production experience available in a region at each stage;
- ensuring of population rational employment (with regard for migration) and of maximum possible level of people's consumption for the present labour productivity;
- levelling of the stages in productive forces development for regions with regard for the most complete and effective use of their resources and production funds.

In the end the fulfilment of these principles ensures effective proportionality of the regions' development corresponding to the interests of the whole national economy growth and to the creation of national economic relations between them, which are advisable from the point of view of economics.

At all changes in the methods of planning of industrial location under different economic conditions, the above general principles are still valid but they are historic in the sense that at different stages of the development they are differently important.

The growth of transportation network and especially of the most effective types of transport, the increase in a technical level and in intensity of the use of transport means ensure flexible transport service and diminish freight charges. As a result, the importance of the proximity to the sources of raw materials as a factor of the industrial location reduces. At the same time the

factors related to industrial and non-industrial consumption become more important. These factors are more d y n a m i c than natural resources since they are based on the practically infinite process of productive forces development and on the growth of social division of labour.

However, the matter is not only in the improvement of transport conditions which, by the way, at the same time influence the effectiveness of finished items and half-finished products delivery to consumers, thus diminishing the importance of the factor for proximity of production from the commodity market.

The decrease in the dependence of the industrial location from natural factors is a regular result of the production development and technical progress in the whole national economy, that is explained by the following reasons.

The technical progress changes the role of natural raw materials, fuel and energetic sources and leads to the economy of these resources. Introduction of new materials, constructions improvement and reduction of items weight result in a decrease of production capacity in material. There appear new sources of energy and raw materials, for example, atomic energy, products of chemical synthesis, etc.

The growth of scales of production itself inevitably leads to the territorial dispersal of production and to its known separation from natural sources of raw materials, then it occurs that the level of regions development may not severely be fitted to their resources, that may be an obstacle to the development of production and may cause a one-sided development of regions.

The process of the territorial dispersal is increased under the action of structural changes in production and consumption occuring as a result of an increase in social division of labour.

The consumption is based on the demand for objects of labour, instruments of labour and articles of personal consumptions. The principle of the production proximity to commodity markets for the branches producing articles of personal consumptions becomes more important with a rapid growth of national prosperity and for those producing means of production it occurs mainly due to a change in the structure of industrial consumption as a result of specialization and development of economic relations among enterprises.

At a modern stage, the branch specialization, combinative and co-operative development define one of the most important trends of technical progress. This is important for the formation of the industrial location since it increases the significance of transformed objects of labour, as compared to primary resources, and at the same time the economic factors become more important, as compared to natural-resource ones. In power supply, for example, the proportion of electric power and thermal power is more and more increased in comparison with fuel; half-finished products consumption is rapidly growing in light, food and other branches of industry. Assembled units and parts occupy an important place in consumed labour objects of the engineering industry etc. The preliminary improvement of natural resources of raw materials is widely used.

Two principles, i.e. ensuring of employment and the levelling of standards in the regions economic development, are closely connected, and they both were invariably taken into account when planning the industrial location and the development of the districts in our Republic at all stages as well as under solution of intraregional economic problems. At a present stage when great possibilities are already achieved these principles become dominating.

No matter what national economic pattern prevails in a region, the people living here should be provided with work and a complex of material and spiritual wealth, corresponding to the level of labour productivity. For this purpose a certain level in development of material production and non-industrial branches is necessary.

The levelling of the standards in the regions economic development should not be obligatorily expressed in levelling of indices for production of consumer goods per capita, as has been considered by many up to now, although it implies their certain approach. But it obligatorily implies the approach of the levels of the population consumption by developing the backward regions and general growth of the welfare of the people. And this may be achieved at a different national economy pattern and when preserving region differences in volume and in a summary index of production of consumer goods per capita.

Thus, under the conditions of the highly developed level of productive forces and a rapid scientific-technical progress the principles of industrial location become more mobile and therefore the problem on the economic specialization of regions is stated in a new fashion.

The problem on specialization of regions is considered to be the most debatable in the theory of the industrial location. To our opinion, specialization of regions should be understood not as a fixed set of branches which is characterized by a complex of attributes different from those in other regions but as a specific economic pattern satisfying the effective problems of regional and interregional development which is peculiar for each stage.

The requirements of the regional and local-branch approach to the industrial location should be obligatorily interconnected so that the total national economy effect when realising a chosen variant must be maximum, as compared to other possible variants.

The location of a branch is determined at the perspective planning and that of enterprises is planned at a predesigned stage and is finally defined when designing. The grounds for construction of an enterprise are chosen according to general location principles, and at the same time more concrete factors which can be easily taken into account should be accounted for.

The choice of the places for location is mainly determined by the availability of free convenient building sites. All other conditions depend upon the character of the branch located, their technological and organization peculiarities. For the enterprises with large water consumption, the condition of water supply is of great importance and for fuel capacious ones - the conditions of fuel delivery. In the majority of branches the transport position of a chosen place of construction is of great significance. In many cases the choice is determined by the presence of neighbouring industrial sites and enterprises, that allows rational use of service, auxiliary shops and communications. For the enterprises processing agricultural raw materials and obtaining it from many suppliers the convenience of raw material delivery and the radius of a raw materials area as well as in many cases the conditions of delivery of consumer goods to a consumer should be, firstly, taken into account. Enterprises having waste especially chemical ones must provide possibility of cleaning air and water. The degree of concentration of industry in this populated area, town-building factors, etc. should be also taken into consideration. In all cases the possibility to ensure enterprises with personnel, the employment of population, conditions of labour and life should be taken into account.

SUBSTANTIATION OF INDUSTRIAL LOCATION

The development and location of industry in the Byelorussia as in the whole Soviet Union is carried out on the basis of perspective national economy plans, schemes and long-term forecasts (five-, ten-, twenty-years) with a subsequent indication by years, quarters and months. The first long-term national programme was the State Plan of Electrification of Russia (SPER) which started continuous interconnected planning of development of national economy and its branches by stages.

The perspective national economy plan is being compiled after pre-plan working out of its main indices performed by planning organizations with participance or research and designing organizations. At present the forecast indices of national economy development for a more long period of time including stage from 1980 to 2000 year are being prepared.

The formation of the national economy plan indices is being made on the basis of two sources of economic information, one "from below" coming from the enterprises and other regional primary economic sections and departments and the other "from above" coming from the planning, research and governing authorities.

The first submit proposals on the most complete use of resources and production development, proceeding mainly from the available producing capacities, local reserves, advisability of the use of local labour, etc. The second formulates the problems and takes into account the consumption of this region and the country as a whole in the appropriate product, the availability of resources and comparative efficiency of different technological methods, interchangeable products and regions of industrial location as well as combined national economy indices, that is very important, the relationship between gross social product and national income, the division of the latter into accumulated and consumed parts, rates of production growth, a planned level of national consumption, etc. Such planning methods ensure a comparatively complete regard for the current and perspective conditions of national economy development and along with other measures guarantee the performance of the planned programmes.

The theoretical and practical criteria in development of separate enterprises, branches, regions and the whole national economy are being worked out in our country, proceeding from the laws of economic development. In some cases the economic policy and practice of the economic construction may deviate from planning principles; however, it is impossible to assume that the methodological fundamentals of planning should not correspond to the requirements of the objective laws stipulating the general trend of economic development.

The choice of a region and grounds for building new industrial enterprises requires the compiling of different variants (including variants for reconstruction of operating enterprises) and determination of indices of their comparative economic efficiency and national advisability.

Proceeding from the role of different factors of location, the industrial branches and productions are subdivided into the groups: inclining to the areas of concentration of labour resources and consumption of goods, to sources of raw materials, fuel and electric energy. Such classification allows to determine the economic role of separate factors. In accordance with this classification each branch or production singles out one or two economic components with the largest specific weight in an expenditure pattern.

Accordingly, when choosing variants depending on the character of branches being located it is necessary to use comparative indices of energy capacity, labour-consuming nature, material-consuming nature of branches as well as more complex derivatives such as energy-labour-capacity or material-labour-consuming nature, etc. which allows more correct estimation of the advisability of development of branches, being at the same time energy- and labour-consuming or material- and labour-consuming in the areas with a supply different level of energy, raw materials and labour resources, concrete form of which is expressed through the maximum national economic efficiency.

When choosing the variants for location of a branch and an enterprise, the above mentioned criterion may be modified, in particular, maximum of profit or minimum of total adducing expenditures. The total adducing expenditures are calculated by the formula:

$$\Pi = C + \varepsilon K + T$$

where

C - current expenditures per unit of product,
K - specific capital investments,
$\mathcal{E}$ - branch normative coefficient of comparative efficiency of capital investments,
T - transport expenses.

When calculating the comparative economic efficiency the general coefficient of efficiency 0.15 (correspond to a n o r m a t i v e period of compensation during 7 years) has been used in the Republic. It differentiates in separate branches, depending on the relation of the value between the main industrial funds and cutting of present expenses (within the limits of 0.33 + 0.1).

When calculating the total adducing expenses both for prime cost and capital investments, all the expenditures are, as far as possible, taken into account, these are: for output or production of resources, main transport, local transport, storage and supply to working places, value of losses, efficiency of devices used, etc.

Parallel with the direct capital investments for creating industrial funds we include also the conjugate capital investments, i.e. the investments into the alien branches of first concentre which provide this enterprise or branch with the elements of circulating funds (raw materials, materials, completing items, electric energy). These conjugate capital investments include also expenses for geological exploring works, necessary growth of transport for conveying raw materials, materials and products.

The extraordinary expenses for recruiting and servicing the workers including the cost of their transfer and expenses for creating funds of an involuntary sphere (building of dwelling-houses, cultural and welfare facilities, medical and other institutions) should be also taken into consideration.

In branches with a long period of creating basic funds (energetics, transport, etc.) there appears the necessity to estimate the total adducing expenditures with regard for the differences in periods of construction of the objects to be compared and to determine damage due to the freezing of funds in capital investments.

When calculating the efficiency of industrial location it is also necessary to use the index of profit and profitableness. Profit is determined as a difference between a product cost in wholesale prices of enterprises and a full prime cost of this product. The coefficient of profitableness is the relation of the profit sum to the cost of basic and circulating funds. On the basis of the data on the additional profit obtained when carrying out one of the variants, it is possible to estimate the periods of compensation necessary for realizing the additional capital investments.

The importance of the adducing expenditures index constantly increases while improving the system of the planned price formation existing in the USSR but this index is not exhaustive since it does not regard for some conditions of the efficiency, for quantitative measurement of which the rather grounded methods are not found yet.

As a result of the comparative estimation of different variants of location, we choose the regions and areas with the most favourable conditions for a new industrial building and find out concrete objects which are to be reconstructed, modernized and broadened. It goes without saying that for variant calculations it is necessary to use the regional indices of location in appropriate branches and for their determination it is necessary to study in detail the conditions of economic development of each region.

However, this does not settle the problem on planning of industrial location. The problem of the rise of the social production efficiency is being solved in the process of a territorial planning differentially, by forming such a national economy pattern of each region which ensures its rational specialization, i.e. the concentration of a complex of productions in this region, which uses the local and outside resources and economic conditions more effectively to satisfy national economic requirements. The scales of production of these or those types of products in different regions are substantiated in the plan projects of branches development and thus the territorial location of industrial capacities of an appropriate branch is determined. At the same time the problem in development of a region plan is to find out resources of specialization of complex development of national economy on the basis of a comparative analysis of efficiency in different combinations of productive branches at its territory and on the basis of the ensuring their optimal correspondence to natural and economic conditions and to the social-economic problems confronting it.

Thus, the effective location of industry depends upon branch and territorial planning. Otherwise, it may appear, for example, that the branch plan envisages extreme development of the enterprises, belonging to the branches which use one and the same fuel, water, labour and other resources in such a volume that they exceed the stocks of these resources in this region. Therefore, simultaneous location of these objects at the territory of a given region may appear to be not rational. This causes the necessity to work out preliminary scientifically substantiated perspective schemes and forecasts of location of productive forces, in which the interests of branches development and complex development of national economy of regions are mutually conditioned.

At the same time the analysis of industrial location at the level of branches shows the influence of location different factors upon the industrial orientation; the regional analysis of the conditions of location makes it possible to establish, what resources and conditions for development of a certain branch of production are available in this region in the nearest future and in the long-term plan. To study potential possibilities of a region regarding its industrial location it is particularly important to have the results of the following regional investigations:

- soil-climate conditions and natural resources: raw material, fuel, water, energy;
- transport-economic specific features of regions: transport providing, interregion and innerregion goods traffic, relations of different types of transport, economic indices of transportation of different goods;
- industrial structure of a region, inter- and innerregion cooperation of different branches, sources of obtaining articles and half-finished articles and commodity markets.

All this is taken into account when locating industry according to the degree of the effect upon the development of this or that industry. Consequently, to make a practical choice among possible variants of industrial location and to come to a decision it is necessary to study thoroughly the peculiarities of separate branches of production and the regional conditions which influence them.

The economic efficiency of industrial location is increased due to a more rational use of raw-materials and fuel energy resources; planned redistribution of population and labour resources among regions and centres for their most effective use in social production; universal regard for advances in science and technology and their perspectives in different industrial branches; improvement of research methods and means of technological-economic substantiation of the industrial location.

The balance method is the most important method to substantiate a general and regional plan which is being used at all stages of industrial location and development. The economic essence of the planned territorial balance calculations consists in coordination of the region demands for a certain types of products with the sources of their defrayment. The region balances give the possibility to reveal the discrepancy between demand and supply, to establish the proper relations between interconnected productions, between volumes of capital construction, capacity of a building base and production of building materials, between resources of farm raw materials and capacities for their processing,etc., as well as to plan inter- and inner-region relations.

Balances are compiled in cost and natural expressions. In particular, the balances of production and consumption of the most important kinds of industrial and farm production; the fuel-energy balance; the electric energy balance; the water balance and the balance of basic funds are compiled. The system of material balances pays special attention to the balances of production and consumption of products widely used in all or in many branches of national economy, for example, the balance of fuel, metal, concrete, etc. as well as of consumer goods.

The balance of labour resources is of great significance in the system of balances. On one hand it allows elucidation of providing the production with necessary labour hands and on the other hand - unused labour resources. When working out the balances of labour resources it is impossible to take into account only region indices as a whole the balances of labour resources of industrial centres and microregions. The development of labour resources balances gives the initial data to draw a plan for preparing qualified specialists and for recruiting and employing labour hands.

The material balances make it possible to balance region requirements in the most important products with the sources of their defrayment. However, the above system of the balances, being extremely important at the modern level of production development is not enough for scientific substantiation of a branch and so much the regional extent location. The determination of volumes and a structure of production and consumption is only one of the stages of planning, moreover, the particular balances taking into account only direct material relations between branches do allow exact determination of combined needs in this or that product and mainly do not regard for qualitative indices of production and consumption, with the help of which the variants to be compared are characterized. It is necessary to have such methods of economic calculation and substantiation of planned decisions which would allow regard for the most important factors and complex relations and dependences which influence the efficiency of production and satisfy the criterion of all possible economy of social labour.

The industrial location dependent on many different factors is a very favourable sphere of an effective solution of economic problems with application of economic- mathematical methods and computers. The economic-mathematical methods and, first of all, non-linear programming ones allow us to choose the most effective variants out of many planned variants in location of separate enterprises, production types, industrial complexes, variants of a branch structure of economy and the trend to use natural resources. However, in production location they should be used with regard for real possibilities, not refusing from the traditional methods in those cases when they are necessary and useful.

The optimum plan of development and location of national economy ensuring minimum expenditures while obtaining maximum results cannot be at present practically presented as a unique model or a system of models since some problems on economic-mathematical modelling are not yet solved. However, there is an experience in the field of optimization of plans and projects for development and location of separate enterprises and industrial branches.

The substantiation for location of an industrial branch is closely connected with determination of optimum specialization and dimensions of enterprises. As a rule, the problems on optimum location of industry are being solved on the basis of relatively simple static transport-production models

and, although they do not give the possibility to take into account exactly a number of relations of non-linear character, the solutions found should be considered as approximate-optimum plans, whose realization ensures considerable national economy at production location.

Such problems were solved to substantiate specialization and location of separate branches of mechanical engineering, light, meat and milk branches, building materials, etc.

During the recent years we widely apply the methods of planning and substantiation of inter-branch relationships and proportions on the basis of inter-branch production balances and product distribution as well as on that of inter-branch balances of basic funds and labour expenses. This method makes it possible to overcome the shortcoming of the traditional methods for compiling particular balances, since it takes into consideration not only direct expenses of a given product in each branch but also indirect ones in the branches which supply this branch with raw materials, fuel and other means of production. Covering the whole complex system of interrelation between the branches of national economy, the inter-branch balance together with the methods of multivariant planning makes it possible to extend considerably a scientific level of planning and analysis of national economy; it promotes an increase in complexity of particular planned and analytical balance calculations, more thorough and correct reflection of branch interrelations and proportions in them, and refusal from isolated narrow-branch approach to determining costs and achievements of production.

In the Byelorussia the inter-branch balances were, for the first time, compiled in 1962, and the known experience of inter-branch planning has already been accumulated. Nevertheless, the application of the method of inter-branch planning is still at the experimental stage. Although the methodology of planning of national economy on the basis of inter-branch balances and models allows a rise of balances ability, complexity and multivariantness of plans, however, when using modern methods for constructing inter-branch balances if does not yet ensure a choice of an optimum variant in a strict meaning of this word and therefore it should be improved in future.

Up to now the inter-branch balance has been mainly used for analysing a pattern and proportions of national economy. At presence the most important trend in using the inter-branch balance becomes a performance of variant balanced calculations of the plan basing on the different volume and composition of finite product fund and the choice of the variant out of gained ones corresponding to certain particular and combined criteria of efficiency.

Optimization of economic specialization and a national economy pattern of each region may be achieved only be using both criteria general for the whole country and interregional calculations. However, the variant calculations with regard for concrete prescribed conditions, which ensure a choice of preferable solutions of a plan, are possible on the basis of a separate regional inter-branch balance.

A further improvement of methodology of industrial location planning, which requires regard for very different factors, to a great extent, must be based on the use of the economic-mathematical methods. To ensure a complete comparison of economic indices on industrial branch, industrial complexes and regions, it is necessary to carry out vast work for creating of a widely spread system of competent technical and economic information. The application of the systems for complex optimum planning of industrial location and development of regions economy makes it possible to refuse from the location of isolated enterprises without sufficient regard for the problems on the rational use of natural and economic conditions of the region, under which the construction of enterprises may appear to be not effective even when applying the most modern technique satisfying the criteria of economic efficiency.

The effective industrial development of the Byelorussian Soviet Socialist Republic, and relative elimination of disproportions in its national economy have become possible due to the creative application of modern methods of long-term planning and substantiation for location of branches, industrial complexes and separate enterprises, that has allowed successful solution of a number of important economic, social, political and other problems as well as specialization in All-Union separation of labour in accordance with natural and economic conditions.

INDUSTRIAL LOCATION AND FORMATION
OF INDUSTRIAL COMPLEX IN THE BSSR

During the semi-centennial history of the Byelorussian Soviet Socialist Republic which appeared at the beginning of 1919 a balanced development of national economy as a territorial economic system took place in close connection with the whole national economy of the Soviet Union. The development of planning in the BSSR has passed some historical stages, starting from framing the first hypotheses on development and year plans of separate branches up to the development of balanced, scientifically substantiated complex national economic current and perspective plans. At each stage of national economic construction the industry location planning was directed to the aim of substantiating more completely the economic specialization of the Republic and its separate territories and of providing the effective use of all resources.

Among other Republics of the USSR Byelorussia takes the sixth place by territory, the fifth, by population and the seventh, by density of population. The population of the BSSR is 8.7 million.

The migration of some part of population influences greatly the demographic situation in the Republic. It should be noted that over two-thirds of migrants are, as a rule, persons of more active and hard-working ages. In consequences of migration actual rates of population growth in the BSSR were slower than in general all over the country.

This defines a necessity of increasing the level and the rates of the development of national economy and its most important branch - industry. The most significant conditions which promote the industrial development of the Byelorussia are: advantageous geographic location and favourable natural-climate conditions, developed network of different-type transport, availability of a number of power and raw-materials resources, a high level of providing with labour resources and experienced specialists, comparatively high density of population and availability of numerous towns and town settlements.

For a long time the Byelorussian Republic was considered to be a region with poor mineral-raw materials and fuel-power resources. Its main resources were: peat, wood, raw materials for producing building materials as well as various farm raw materials for food and some other branches of light industry. In reality it has turned out to be otherwise. The intense study of mineral

resources of the Republic by means of the newest methods has led to a discovery of rich deposits of the most valuable minerals: potash and rock salts, petroleum, coals and shales. The deposits of other resources are being sought intensely.

From the prerevolution period the Byelorussia has inherited a very retarded level of the development of economics and an extremely low living standard of population. In the industry of Byelorussia small-scale enterprises with the most primitive technology were predominant. In 1913 the level of production of industrial items per capita in Byelorussia (according to its present bounds) was almost 5 times lower than in Russia. In Byelorussia a certain development was marked only in timber, sawing, match cardboard-paper, cotton, brick, sewing, tanning, shoemaking and some food industries.

The Soviet Government attached great importance to economic development of regions of our country which were backward in the past. During the years of the Soviet power the industry of the Byelorussian Soviet Republic was developing at extremely rapid pace, exceeding even the rate of the industrial development of the whole country. Vast capital investments were put in the industry of Byelorussia, and a powerful industrial machinery answering the modern research-technical level of development was created.

For thirty-eight years (1929 - 1966) the average annual rate of an increase in industrial production in Byelorussia was 10.6%, including for pre-war twelve years (1929 - 1940) - 15.7% and for the first post-war fifteen years, including the period of reconstruction of national economy - 22.6%.

Despite the ravages of the First-World War and Civil War, in 1928 the gross output of the BSSR industry exceeded the level of 1913 by 1.4 times. In the subsequent years, i.e. during the first three years of the third Five-Year Plan the BSSR industry was greatly developed, and already by the beginning of 1941 it is converted from a retarded agricultural region of Russia into a forward Republic of the USSR with developed industry. In 1940 the gross output of industry increased more than by 8 times, as compared, to 1913. The number of workers increased approximately by two times and labour productivity - by 4 times.

The German-fascist invaders during occupation of Byelorussia almost completely destroyed large-scale industry in the Republic and sacked the industrial

equipment. In 1945 the level of the industrial production in the BSSR was 5 times less than in 1940. Owing to this fact the main task of the fourth Five-Year Plan (1946 - 1950) consisted in regaining the prewar level of industry and exceeding it partially. This task was successfully tackled by the Byelorussian people with the help of the whole Soviet people. In 1950 the volume of the BSSR gross output exceeded that of 1940 by 15%.

The planned programmes at all subsequent stages envisages high rate ensuring a rise in all branches of national economy. As a result of their realization, the industrial production in the Republic increased by 6.8 times in 1951 - 1966.

In 1966 the gross output increased by 64 times, as compared to that in 1913. The production of industrial products per capita increased more than by 50 times, and labour productivity - by 14 times. The Byelorussian industry reaches about 60% in the structure of gross social product.

In the Five-Year Plan of national economy development for 1966 - 1970 a great speed of the industry development in Byelorussia is again planned. For five years the volume of production of industrial output will increase approximately by 1.7 times in Byelorussia.

The place of Byelorussia in the industrial complex of the Soviet Union, the branch structure of its industry, and the location of branches and enterprises of the Republic were determined in accordance with the main methodological demands of social industrial location. Moreover, each new stage of development introduced structural changes in accordance with the results of the previous stage and the problems of national economic development for a perspective period.

At first, the development of the BSSR industry, almost entirely, based on using the local resources. Historically, the beginning of this stage corresponds to the period of reconstruction of national economy destroyed after the First World War and the Civil War as well as to the subsequent years before the beginning of the First Five-Year Plan.

Under this period the production in old pre-revolutions branches of industry such as tanning, food, woodworking, sewing was reconstructed and broadened. These branches continued preserving main specific weight in a complex industrial manufacture. However, this appears to be insufficient to solve the problem

dealing with employment and security of necessary changes in the development of productive forces. Some new enterprises have been built, in particular, the Engineering Works in Minsk, but the scales of new building and technical re-equipment of industrial enterprises were not considerable.

Already during the period of the first Five-Year Plan realization serious structural changes took place in the industry of the Republic, since the plan foresaw the outstripping rate of development of branches of heavy industry while preserving that of light industry. This has led to a decrease in the volume of the old branches, which were unilaterally developed in prerevolution Byelorussia despite the fact that they were enlarged by a number of new large-scale enterprises with high technical equipment (Bobruisk Woodworking Plant, Borisov Match Factory, large Sewing Factory in Vitebsk, Orsha Flax Plant, Minsk Confectionary Factory, etc.). The proportion of these branches diminished due to the growth of peat, metalworking and chemical branches. The Artificial Fibre Plant in Mogilev and the Farm Engineering Plant in Gomel were put into operation.

This process continued also during the subsequent periods at all stages of the development of national economy. The main task of the second Five-Year Plan was to complete the reconstruction of the whole national economy and to create the newest technical base for all the branches of national economy. Under the second Five-Year Plan the main stress was laid not on a quantitative rise of product output but on the improvement of output quality and on the growth of labour productivity in the industry. The second and third Five-Year Plans of national economic development in the Byelorussian Socialist Soviet Republic envisaged more high rate of development for peat, metalworking, chemical industries and the industry of building materials being of great importance for rational use of local fuels, raw materials and labour resources of the Republic.

Under the years of the second and third Five-Year Plans the dozens of new large-scale enterprises: Gomel Glass Plant, Mogilev Tube-Casting Plant, Mogilev Autorepair Plant, Minsk Radio Plant, etc. were built and put into operation. Many expenses were also, at the same time, spent for reconstruction of the existing enterprises, in particular, of machine tool ones.

Due to the rapid growth of needs for power and fuel and the presence of great peat reserves in Byelorussia the developed peat industry has been created

and a number of peat power stations have been built. On the basis of local raw materials the large concrete plant has been built in Krichev. The enterprises for industrial processing of agricultural raw materials have been built in the regions with the most developed marketable cultivation of flax, potato culture and animal husbandry.

The metalworking industry based on imported raw materials underwent very considerable changes. In the years of the industrialization new branches were grounded such as: machine tool construction, agricultural machine tool construction, manufacturing of peat and road-building machines. The machine tool construction became of great importance. In 1940 the Republic produced 10.2% of all metal-cutting lathes which were manufactured in the country. The chemical industry was developed on the basis of local raw materials. The productions of artificial fibres, acetone solvents, hydrolysis alcohol, tanning extracts, etc. were created during the Five-Year Plans in Byelorussia.

The textile industry underwent great changes. In Byelorussia such large-scale enterprises as Orsha Flax Plant and two knitted goods factories were built. On the eve of the Great Patriotic War 20.4% of All-Union production of flaxcloths and 16.7% of stockings were produced in Byelorussia.

In 1940 as compared with 1913 the gross output of the peat industry increased by 101 times; metal working one by 53.1 times; chemical one by 56.3 times; textile and leather and shoe one by 28 - 29 times; food one by 17.2 times; production of building materials by 16.5 times and of woodworking branches only by 3 - 7 times.

The reconstruction and development of the industry in Byelorussia was carried out very intensely after the Great Patriotic War. More than 70 large-scale industrial enterprises were already reconstructed in 1946; these are machine tool plants in Minsk, Gomel, Vitebsk, Bobruisk Timber Plant, Minsk Radio Plant, Gomel Glass Plant, etc; then the industry of the Republic was enlarged with a fine-cloth mill, two shoe factories, bicycle, tool and other plants in Minsk, a carpet-plush mill and the largest sewing factory in Vitebsk, the first part of the Grodno fine-cloths mill and the construction of the furniture factory in Bobruisk were completed.

During the years of the fourth Five-Year Plan new power stations were built in Baranovichi, Molodechno and Skidel. New branches of industry such as

canning and fine-cloths were developed; the reconstruction and newly built plants such as Volkovyssk Concrete Plant, etc. were put into operation.

The industry was developed in two trends: the expansion of the existing enterprises and their equipment with modern facilities, and the building of new factories and plants. For 1951 - 1955 one hundred and fifty large-scale industrial enterprises were built and put into operation, such as Worsted Mill, Watch and Bearing Plants in Minsk, Vitebsk Silk-Weaving Factory, Orsha Sewing Machine Plant and Skidel Beet-Sugar Factory.

For 1959 - 1965 more than 300 large-scale enterprises and shops were built in the Republic. The branches ensuring technical progress were especially rapidly growing in the Republic. For seven years the output of electric and thermal power increased by 3.6 times, and that of chemical industry, engineering and metal processing by 3.4 times. The output of aparatuses, means of automatization and their spare parts increased almost by 5 times and that of glass fibres by 7.3 times.

The war and the occupation of the Byelorussian territory by the German-Fascists invaders, almost complete destruction of industrial production on its territory and the necessity of its rapid reconstruction made essential corrections to the basis of the post-war formation of the Byelorussian industrial complex which influenced the location of industry later on. Along with the reconstruction of the pre-war branches on the BSSR territory were located such productions: automobile and tractor works, motor bicycle factory, production of some types of lathe equipment, building and road-building machines, etc. which served as the forming bases of a vast and very effective engineering complex.

This corresponded to the problem on a rapid growth of the republic economics and at the same time did not contradict the principles of location of productive forces since the metalworking industry is related to the branches possessing a certain independence in relation to a raw-materials base, and its products were in popular demand in Byelorussia and in the neighbouring regions of the country. A number of large-scale enterprises of new branches of light (mainly textile) industry working at imported raw materials and local labour resources were also built.

Such factors as the supply of a great amount of natural gas and petroleum being at the same time the most effective fuels and the initial material for organization of a number of high qualified chemical productions; the discovery of the rich mineral-raw materials resources in the Republic; the intense development of processes of specialization, co-operation and combination of production, and the growth of inter-industrial relations greatly influenced the location of industry in Byelorussia during the post-war years.

At present in the industry of the Republic the following branches are mostly developed: energetic branch; in the fuel branches - peat and oil refining; in the engineering - automobile, tractor, bearing, machine-tool, electral engineering, instrument-making and radio - electronics; in the chemical branch - production of mineral fertilizers, rayon fibres, plastic articles, products of timber-chemical industry and rubber-engineering articles; in the branches of light industry - flax-manufacturing, wool, knitting, sewing, leather-shoe; in the food branches - meat and milk, vegetable-preserving, mill, confectionery; there are all types of productions on provision and processing of wood and all branches of mineral building materials.

The energetic branch is presented by a number of thermoelectric power (condensation and heating) stations of mean and small dimensions operating in the energetic system and ensuring energy consumption of the Republic. For many years the fuel base of power energetics and at the whole national economy of the Republic was mainly represented by local fuel, i.e. by peat reserves of which are tremendous in the Republic and only partly by imported coal. This was advisable since the calculations of the comparative economic indices have shown that in Byelorussia peat is more effective than all kinds of the imported solid fuel, and the gas and petroleum were supplied into the Republic in very restricted amounts, in accordance with the results for calculating comparative efficiency of these fuels in different regions of the country. The increase in the delivery of gas fuel and petroleum as well as the petroleum output in Byelorussia diminishes the importance of peat fuel, and at present its portion is about 30% in the fuel balance of the Republic instead of 65% in recent times. Owing to this fact the output of fuel peat in the Republic is stabilized and then it will be used only for the needs of public utilities.

The organization of the oil-refining production in the Republic on the basis of the oil coming from Povolzhje through a pipe-line has appeared to be very effective. It will become still more effective while using the oil of the Byelorussian deposits on a large-scale. This has allowed not only provision of Byelorussia and its neighbouring regions with oil products at comparatively favourable economic indices but also has ensured th basis for establishing a number of chemical enterprises. In the Republic on the basis of oil raw materials the production of tires and rubber-engineering artioles was organized, which ensures the needs of the appropriate manufactures and operation needs of motor transport. In the nearest future a developed oil-chemical complex including output of a number of valuable chemical products refining matters, low octane gasoline, bensoles, liquid and solid paraffins will be constructed in BSSR.

This is the richest raw-material base to organize the production of artificial resin, chemical fibres and other products of organic synthesis.

The chemical production is complex by its nature; the use of its original raw materials is effective if at a time the whole number of products is produced; this causes the concentrated location of chemical productions.

Seven to ten years ago the chemical industry of the Republic was weakly developed and mainly presented by the production of artificial fibre, varnish coating articles and some articles of everyday chemistry. Ever increasing importence of chemical products due to the technical progress of the national economy in all branches and the discovery of new scurces of chemical raw materials were a powerful spur to the very intense development of this branch.

The potassium mineral fertilizers are produced in Byelorussia on the basis of the Byelorussian deposits of potash salt, the nitrogenous ones - on the basis of a natural gas and the production of phosphorous fertilisers will be started in 1970 on the basis of processing the Kolsk apatites and Ural pyrites. These enterprises are being broadened and in the nearest future will completely provide Byelorussia with nitrogenous and phosphorous fertilisers as well as the neighbouring regions with potassium fertilisers.

The production of artificial resins and plastics will be developed on the basis of the complex processing of the Byelorussian rock salt and hydrocarbon raw materials produced on the basis of the oil-chemical manufactures.

In the nearest future the chemical complex at the designed Mozyr Chemical Mill will be established on the basis of the Byelorussian rock salts. The production of chemical fibres organized at two artificial-fibre plants and at two building ones for production of lavsan and nytron will be developed in future on the account of producing kapron silk and kapron cord when using as raw material the kaprolaktam produced at Grodno Nitrogenous Fertilizer Mill.

At the same time the Republic creates a developed industry on plastics processing with wide range of goods for industrial branches, building and everyday life.

Under location of chemical and oil-chemical productions in Byelorussia we take into account also possibilities of their perspective decrease in energy capacity, of the rational use not only of imported but also of local fuels as well as labour resources in the Republic.

The machine engineering and metalworking industry is the most developed branch of industry in the Republic by the volume of gross output and the number of workers. Besides, the above most important engineering manufactures there are also many others: production of peat equipment, medical instruments, ballbearings, some types of trade equipment and food industry equipment, sewing machines, etc. The major part of them is produced for the needs of the Republic and only a small part, for export.

Since this branch is based on imported metal, then for the last 10-15 years it was developed mainly at the cost of labour consuming productions with small-scale consumption of metal and at present their proportion in the gross output of engineering is about 30%. As to the produotions with large-soale and mean-scale consumption of metal they are developing rather slower mainly due to the complete use and expansion of the available capacities according to the economic advisability as well as due to specialization and construction of auxiliary and servioe manufacturings. These trends of development and location of engineering will preserve in future.

In the automobile industry it has appeared economically advisable to establish a new automobile works (second in the Republic) which produces dump trucks with carrying oapacity of 25-40 tons and more and the automobile works in Mogilev on the basis of works producing prime movers and automatic cranes but the first autoworks of the BSSR automobile industry - the Minsk Automobile Works continues production of motor oars with mean carrying oapacity.

A very perspective trend of separation of social labour in engineering deals with disintegration of specialized enterprises which are closely connected with the head assembly ones or supply these enterprises with assemblies, spare parts and semi-manufactured articles in accordance with the co-operation conditions.

As a result of development of co-operation specialization the interbranch inter-industrial relations are widened and strengthened. According to the data on the interbranch balance, the proportion of branch output is over 4% in engineering branches in total expenses of labour objects.

These processes resulted in construction of the Minsk Motor Plant, Gomel Tractor Starting Motor Plant, Borisov Motor and Tractor Electrical Equipment Plant, Minsk Tractor Spare Part Plant, Minsk Spring Plant, Bobruisk Motor and Tractor Part Plant, Borisov Hydropump Plant, Grodno Hydrosteering-Wheel Amplifier Plant "Autosapchast", Automobile Units Plants in Baranovichi and Grodno and Borisov Hydroapparatus Plant. On the basis of detail and stage specialisation there appeared a number of enterprises of exact engineering, instrument-making, radioelectronics, etc., for which the problems of standardisation and unification of output and technology as well as the co-ordinated development of research-designing organisations are of great importance.

The important trend of specialisation of the engineering industry is a deliverance of the engineering plants from manufacturing products not peculiar to their basis profile (instrument, casting, metal constructions, stampings, plastic parts, fastenings, non-standard equipment, etc.) and the construction of large-scale specialised plants for production of these items.

The organisation of comparatively developed specialised production of metal-cutting instruments, centralised casting production, metal constructions, a number of plants for manufacturing plastic parts as well as metal-working enterprises servicing operation needs of different branches of the national economy, first of all, repair enterprises was economically justified in the Republic.

In the nearest future it is necessary to create the specialised production of hot stampings and forgings, welded constructions, substitutes, mechanisation means, package, etc.

The mechanical engineering enterprises require also the output of many other branches: plastics, wood, leather, glass articles, etc. All this is being directly produced in the Republic.

The timber, paper and wood-working industry, besides timber chemistry, is presented by timber enterprises, the production of saw-timber materials, matches, veneer, furniture, building parts and standard houses, a number of consumer goods and by the developed paper production.

This branch is mainly operating on its own raw materials and widely uses the waste materials. The Republic imports some wood and saw-timber materials which mainly occurs as exchange of goods. Up to now cellulose was delivered for paper production. These enterprises are located at the places convenient for wood delivery and in many cases represent mills.

The growth of this branch is stabilized since the resources of the Republic are limited and its further development will be carried out mainly due to the production of building parts, widely using the waste materials of timber cutting and woodworking (mainly, wood-shaving and wood-fibrous plates) and partly due to furniture manufacturing.

The concrete production is of great importance in the branch of building materials in the Republic. Due to the application of the industrial methods of building the production of prefabricated iron-concrete constructions and parts is widely used. This weakened the dependence of a number of productions upon raw materials deposits and removed it, to a great extent, to the places of building. The production of building materials began to develop more rapidly, using chemical raw materials.

The branches of the textile and light industries developed in Byelorussia are closely connected either with raw material sources or with areas of consumption.

In the Republic two textile branches such as flax-working and wool are greatly developed. The first has raw materials in the Republic (Byelorussia takes the first place regarding flax production in the Soviet Union) and a commodity market, but it sells off its produots partially outside the Republic. Regarding the wool branch using the imported raw materials, it was developed in Byelorussia not only to ensure the demand of the sewing industry developed in the Republic and direct needs of population for cloths and carpets but also

to utilize female labour. This is important not only to increase general employment but also to combine in a proper manner female and male population in the areas where the productions are developed with the predominance of the male labour. These branches have large perspectives of the further development due to the increase in the demand for articles, the improvement of a raw materials base and the creation of the developed chemical fibre industry in Byelorussia. The latter circumference will also serve as the basis of a large development of the silk industry in the nearest future, whose output is used not only for the needs of the sewing and knitting productions but also for the tire production organized in the Republic on a large scale. The cotton industry begins to develop rapidly in Byelorussia, taking into account the demand of the population.

The leather-shoe production developed in the Republic on a large-scale is based on the local raw materials and is intended for the local consumption.

The wide network of potato and vegetable preserving enterprises producing alcohol, starch, canned vegetables, dried potato and vegetable, etc. is concentrated in the areas producing potato and vegetables.

The milk and meat mills are spread over the whole territory of the Republic, whose products mainly satisfy the internal demand of the Republic and only some part of them is exported.

The articles of personal consumption are being manufactured at a great number of the enterprises in Byelorussia. These are refrigerators, motorcycles and bicycles, watches, different electric articles, radio sets and television sets, fountain pens, musical instruments and other items of mechanical engineering and metalworking branch, chemical-pharmaceutical goods and everyday chemistry articles, furniture and other woodworking articles, plates and dishes, and different glass-china articles, a big variety of light industry goods and the most important food-stuffs and, at last, service production.

The product of the printing and publishing industry developed in the Republic and of some other branches plays essential role for meeting the cultural demands of the population. All these productions are rapidly growing due to the increase in prosperity and demand of the population. The variety of the goods produced increases and satifies the needs of the Republic, the assortment of produced items is growing and satisfying as a whole the Republic needs.

The effective industrial development of the Republic also supposes a rational location of industrial enterprises on its territory and correct combination of branches in regions, and in populated areas.

From the past Byelorussia inherited not only general economic backwardness but also non-uniform location of industry. The Western regions of Byelorussia which belonged to Poland for two decades were behind the Eastern regions of the Republic in their development. In connection to this the fourth Five-Year Plan and the subsequent post-war Five-Year plans provided for the higher rate of industrial construction and advantageous location of new enterprises in the Western regions of Byelorussia considering it to be the main task, as a result of which their proportion in total production considerably increased. The problem of further approach of levels of development of the Western and Eastern regions of Byelorussia is still urgent up to now.

After-effects of the war and the German-Fascist occupation of the Byelorussian territory counted not only on the formation of the national economy pattern of industrial production but also on its location. Reconstruction and expansion of the destroyed pre-war enterprises stood at the same time for the restoration of the industrial value in the pre-war industrial areas and since in this case the economy of time and means ever mainly taken into account therefore these areas were developed in the first place. These areas are the following: Minsk, Gomel, Vitebsk and Mogilev. But at the same time an important industrial development started in the following towns which were relatively under-developed in the past: Grodno, Brest, Volkovyssk, Lida, Bobruisk, Borisov, Mosyr, Polotsk and others. Thus, together with the structure improvement and the creation of new productions in large cities the industry began to locate mainly in average towns. In addition, the industry arose in many new populated areas which in many cases served as a basis to build new towns with the developed industry. These are Zhodino, Soligorsk and Svetlogorsk. All this promoted more uniform and effective location of industry in Byelorussia, since economic indices were always taken into account.

The range and choice of location areas for enterprises depends upon their concrete character. If the enterprises of branches, processing local original resources, are mainly located in the regions and areas of extraction and production of these resources there is a very great freedom in choosing the location grounds and it is possible to take into account more completely numerous conditions and factors when locating enterprises using converted

types of energy, raw materials and materials. The enterprises operating on imported resources are considerably independent when choosing a place of industry location, and this allows their more or less uniform location on the territory of a region; first of all, this is referred to mechanical engineering.

Unlike the constant tendency to the territorial dispersal of production, the modern state of the industrial development with constantly and rapidly increasing volumes of production and consumption with the growing inter-industrial relations leads to effective steps for the grouped location of enterprises and for formation of industrial complexes and units.

The enterprises of certain branches, which are widely developed during recent years according to the type of their production, require complete organised and territorial combination; with other productions, i.e. combination; for other branches the known territorial localization with organised self-dependence (the so-called industrial complexes) is advisable. These are technologically congenerous enterprises which are supplying each other with materials, semi-manufactured articles, manufactured items assemblies, etc., either which are united by auxiliary storing shops and designing-technological services or at last by close technological relations in complex use of raw materials and their subsequent processing; frequently these are the enterprises of one branch but they may be the enterprises of different branches united by the community of consumer goods. This ensures great economy of means both due to the objects of main production and due to the simultaneous use of the objects of the common plant facilities, engineering communications, transport, energetic facilities, developing of new territories, etc.

The amalgamation of industrial enterprises into mills on the basis of combination is the most peculiar for the branches which use raw materials and energy being multicomponent, little transportable and inconvenient in storage or which represent a multistage industrial process. This amalgamation has great perspectives in the regions where metallurgical, chemical cellulose-paper, food and light industries are being developed.

This example may be clearly seen in the development of oil-chemical mills. The modern orientation of many chemical products and waste materials of oil-refining makes it possible to carry out the combination of oil-refining plants with chemical ones. As a result, the modern oil-refining plants convert into the industrial mills for complex processing of oil, producing different types

of motor fuel and other oil products and at the same time a great number of various chemical products. According to the available calculations the combination of oil-refining with oil-chemical productions allows a decrease in capital investments into the chemical enterprises approximately by 35% and the prime cost of oil-chemical output, by 25%.

In Byelorussia the designing and construction of oil-refining plants and oil-chemical productions are being carried out in Polotsk and Mozyr on the basis of low-octane gasolines of the straight-run distillation and dearomatized refining products of catalytic reforming. On the basis of complex oil refining the Polotsk industrial group unites a number of manufactures carrying out subsequent processing of oil raw materials. The combination of mutual productions in one large-scale complex ensures considerable economy in capital investments and operation expenses. Besides the community of raw materials, the efficiency of combination of oil-refining with oil-chemistry is determined by the same technological processes and methods for processing liquid and gas oil products which are used in these branches. The considerable economy is also achieved due to the organization of the common-repair-auxiliary and transport-storage facilities, the common system of roads, engineering communications, a building base, etc., i.e. due to the factors conditioned by the rational territorial organization of production.

It should be noted that these factors are of special importance for chemical industry enterprises, since only chemical productions are characterised by the increased proportion of service facilities (energetic, transport, engineering communications and structures) in the total cost of construction.

The territorial approach of the enterprises while building the industrials complexes ensures additional economy due to a decrease of expenses for transportation of supplied articles and due to a decrease of recesses in an industrial process, due to an increase in output delivery and circulation of circulating means, more complete combination of interests of suppliers and consumers, an increase in the quality of finite product and creation of more favourable conditions for preparing specialists.

To a considerable extent, this is also related to the enterprises of the mechanical engineering branch. For location of mechanical engineering enterprises, since they are operating on imported raw materials and are intended for a wide commodity market, predominant is not the location of sources of

raw materials and of areas of consumption but the mutual relationships between the located enterprises which appear as a result of the further development of their specialization, co-operation of combination as well as the conditions of the rational use of labour resources and town-building factors.

In Byelorussia there are also a number of centres where the mechanical engineering complexes are gradually being formed. These are Minsk, Gomel, Vitebsk and Bobruisk.

Both of these forms in the social organisation of production, finally, cause the efficiency of the grouped location of enterprises and lead to the foundation of industrial complexes and the rise of industrial settlements which are formed under the influence of not only industrial factors but also of the combination of material and cultural needs of the population.

The preference to the grouped location of new enterprises does not eliminate, in some case, the advisability of single (isolated) location of these or those productions. However, in all such cases it is necessary to take into account the possibility and the efficiency of the organisation and development of additional productions in this place and thus of the foundation of a new industrial complex in future.

When choosing the places for new enterprises in Byelorussia in the majority of cases the optimal conditions of operation of not separate enterprises but of a group of interconnected or co-operated ones were taken into account.

The location of a large-scale enterprise at any place is frequently the first reason of formation of the whole complex of interconnected products in future. The larger is the enterprise, the greater it combines different allied enterprises which supply it with raw materials, semi-manufactured articles, materials, energy, which consume its products and use waste materials of production, etc. It is also necessary to take into account that each large-scale enterprise employment of labour is quite big, and at the same time the modern specialised enterprises have mainly high demands either for female or male labour. Therefore, the location of a large-scale enterprise with the main use of male labour should combine with that using female labour at this very place and vice versa. Moreover, a great number of persons working at a large-scale enterprise require the organisation of servicing enterprises of food and light industries orienting in their location on consumers of their products.

This may be illustrated by the industrial development in the town of Zhodino. 1959 witnessed the start of the construction of the large-scale Automobile Works (BelAZ) which is the second in the Republic. Later on, out of a number of competing places, Zhodino was chosen as the site for locating a new plant on produotion of assemblies for the automobile enterprises. It was also taken into consideration that the Byelorussian Automobile Works (BelAZ) is the main consumer of this plant's produots and is serviced by a large designing office, where similar assemblies are being designed. Moreover, it appeared possible to locate a new plant near the Automobile Works, that ensures co-operation of subsidiary shops and administrative services of both enterprises. The construction of two large-scale enterprises of automobile engineering in a small town with a population of 10,000 (since these enterprises are mainly serviced by men) raised the problem of employment of women. Due to this fact it was advisable to build in Zhodino one more enterprise, i.e. a large-scale factory of light industry with employment for about 3,000 workers, mainly women.

As a result of location of these enterprises and the effeot of some other town building factors, the population of Zhodino inoreased up to 40,000-60,000. To provide such population with foodstuffs, it is necessary to establish the appropriate enterprises such as bread-baking plant, milk plant, meat mill, servioe enterprises, etc.

The problem of the further improvement in location of productive forces, the increase in efficiency of the industrial structure of the Byelorussian Soviet Socialist Republic is one of the most important problems of the national economic development, upon solution of which considerably depend the level and the rate of growth of the national economy of the Republic, regions, cities, districts and the prosperity of the population in the Republic.

The determination of rational proportions in the national economy and of its most important branch - industry - in accordance with the requirements of the law of the planned development of the socialist national economy, was one of the most important bases of planning of the national economy at each stage of the development of the Republic, and is still of great importance up to now. The economic development of Byelorussia witnesses the successful realization of the problems on the rational location of productive forces in the Soviet Union which were raised by the Programme of the CPSU.

The undeviating improvement in planning of industrial location at each stage of the Republic's development has allowed successful solution of a number of important economic, social, political and other problems. The industry of the Republic developed and will further develop and specialise in the All-Union separation of labour in accordance with its natural and economic conditions with regard for objective economic laws of socialism.

## Bibliography

1. E. B. Alayev, Efficiency of complex development of economic region, "Nauka", Moscow, 1965.

2. P. M. Alampiyev, Economic division into districts of the USSR, Gosplanisdat, 1959.

3. P. M. Alampiyev, Economic division into districts of the USSR, Vol. 2, Moscow, 1963.

4. Problems on methods of research of industrial location, Moscow, 1967.

5. Problems of industrial location in the USSR, Moscow, "Nauka", 1964.

6. A. Efimov, Planning of the national economy in the USSR, "Economika", Moscow, 1967.

7. W. Isard, Methods of regional analysis: an introduction to regional science, New York, 1960.

8. Criteria of location of industrial enterprises, New York, 1967.

9. V. A. Nash, Optimum location of the productive forces in the national economy. Collection "Mathematical methods and problems on industrial location", Moscow, "Economisdat", 1963.

10. V. A. Nash, Scientific problems on working out of general scheme of location of the productive forces of the USSR, "Voprosy economiky", No. 9, 1966.

11. N. N. Nekrasov, Scientific principles of location of the productive forces during the socialism, "Planovoye khosjaistvo", 1966.

12. Peculiarities and factors of location of branches of national economy, USSR, Moscow, Edition of the Academy of Sciences, USSR, 1960.

13. Common methods of working out of general scheme of the productive forces of the USSR during 1971-1980, "Economika", Moscow, 1966.

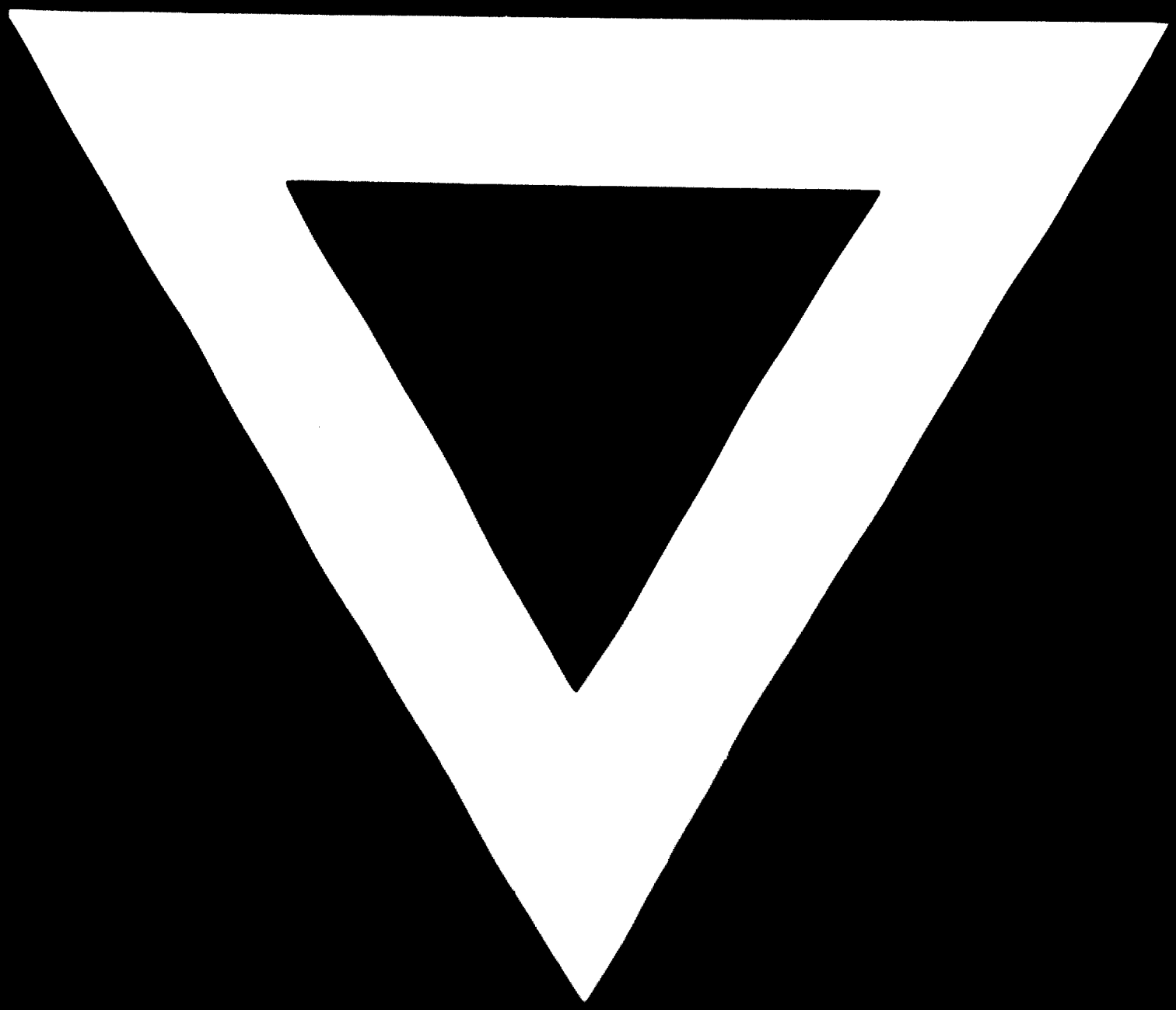
14. Problems of economic efficiency of location of socialist production in the USSR, "Nauka", Moscow, 1968.

15. A. E. Probst, Efficiency of territorial organisation of industry (methodological essays), Moscow, "Mysl", 1965.

16. Development and location of the productive forces of economic regions of the USSR, "Nauka", Moscow, 1967.

17. U. G. Saushkin, Complex development of national economy of the USSR, "Znaniye", Moscow, 1966.

18. I. Shilin, Methodological problems of working out of branch plans of industrial location, "Voprosy economiky", No. 4, 1968.



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