METHODOLOGY FOR DIFFERENTIATING SPATIAL DEVELOPMENT PROGRAMS BY ZONES

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PREFACE

The systems analytical approach to the study of integrated regional development implies a joint consideration of elements constituting the regional system and of problems associated with specific sets of regional characteristics. This requires the grouping of elementary geographic (or administrative) areas into homogeneous zones in accordance with their socioeconomic characteristics. The purpose of this analysis is to provide planning authorities with guidelines for preparing adequate socioeconomic policies.

This paper summarizes the results of a classification and grouping of approximately 160 spatial units within the USSR into a small number of homogeneous clusters. It will be of substantive and methodological relevance for scholars engaged in integrated analyses of regional development.

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1. PROBLEM AND RESEARCH METHOD

1.1. Problem

Integration of sectoral and spatial approaches to planning and management of the national economy of the USSR is becoming increasingly important. Only regionalization of national programs can ensure an adequate solution to social development problems. Economic growth is becoming more dependent on social processes with clearly defined regional dimensions.

This paper presents some general conclusions and findings resulting from an analysis devoted to classification of regions in the USSR from the point of view of problems arising in the development of the agricultural sector of the national economy. The main goal was to determine relatively homogenous groups of regions, in which common problems of social, economic, and technological development are acute.

In the course of this study some methodological principles were elaborated and tested for their success in relating the characteristics of regions to their problems of economic and social development.

In the USSR over the last 15 years the technical equipment of the rural labor force has increased fourfold, productivity

twofold, and farm output by 50%. Rural incomes have approached those of the urban population and in some areas even exceeded them. Compulsory higher education has been introduced in rural as well as in urban areas. The pattern of settlements and consumer services provided for the rural population has been improved, and the construction of housing and cultural institutions is expanding.

However, a broad range of problems related to rural economic and social growth are as yet unsolved. In this connection two crucial interrelated targets have been proposed: national self-sufficiency in food supplies and agricultural raw materials and a considerable leveling of rural and urban living standards. These problems are also linked to the fulfillment of the long-term food-supply program. Its implementation will provide for an integrated solution to the problems of rural economic and social growth at the national, republic, regional, and local levels.

The food-supply program of the USSR should contain not only national but also zonal and regional targets differentiated so as to facilitate the most effective achievement of national goals. The set of alternatives used in determining regional targets should therefore be based on a unified concept of rural socio-economic development and its main direction.

But how are decision-makers to define the zones that require programs and goals? Neither the 15 union republics, nor the 24 economic regions into which the territory of the USSR is divided can be considered as suitable units, since many of them are extremely heterogeneous. The taxonomic units at the provincial level* are more homogeneous, but their number (160) is too great to disaggregate the long-run program directly from the national to the provincial level: an intermediate link is required. Thus, we have constructed zones differentiated by their contemporary socioeconomic status and their long-term prospects. These zones have been defined by classifying the nation's rural regions†

*Taxonomic units at the provincial level are Oblast, Kray, autonomous republics and those union republics that are not divided into provinces.

†By rural regions we mean rural areas of provincial level units.

according to the acuteness of their economic and social problems, i.e. regions exhibiting similar problems are grouped and then plotted on a map.

1.2. Research Method

The definition of the socio-economic problem and the means of measuring its acuteness are especially important in classifying regions according to their food-supply problems. We have defined the acuteness of a socio-economic problem in a certain region as the discrepancy between the target required by society and the actual state of a given aspect of the rural socio-economic system. This definition allows us to measure and compare the acuteness of certain problems in various regions. Suppose for example, that it is necessary to increase over two decades the average duration of higher and vocational education of workers in region X by 1 year and in region Y by 3 years. In this case it is possible to define the problem of the insufficient educational level of workers in region Y as three times as acute as in region X.

To use this kind of comparison, the targets of long-run development of each region must be preliminarily determined in quantitative terms. But regional targets can only be determined after the large zones have been defined and their goals have been established. We have simplified our task by assuming that the ultimate purpose of socio-economic development is similar in all regions. In this case the comparative acuteness of each problem in various regions can be ascertained by its current position on the relevant scale of various indicators. For example, the problem of the insufficient educational level of workers will appear the most acute in those regions where the average duration of education is the shortest.

In order to determine the set of the most crucial problems of long-term rural growth, we analyzed the functions of rural areas within society. Their principal functions are:

-- satisfaction of society's needs for foodstuffs and raw materials;

-- population reproduction;
-- demographic, social, and economic development of territories;
-- provision of recreational and health-care facilities;
-- spatial organization of rural activities;
-- provision of diverse job opportunities in the public sector for the rural population;
-- satisfaction of rural residents' economic, social, and cultural needs;
-- opportunities for personal fulfillment through education, learning, etc.

For a detailed discussion of this point, see Zaslavskaya and Ryvkina (1980, pp. 16-20).

We take the optimal fulfillment of all these socio-economic development functions as a general goal, which is disaggregated into a set of more detailed objectives for the fulfillment of each function. In order to fulfill these objectives, it will be necessary to solve a number of specific problems, of which each corresponds to a particular direction in the growth of rural areas.

As a result of disaggregating the main goal, we obtained the following requirements for rural socio-economic development:

1. to increase per capita food output;
2. to improve the quality of food products;
3. to raise economic efficiency;
4. to normalize birth rates;
5. to improve the age structure of the population;
6. to obtain a more balanced sex structure;
7. to decrease morbidity and death rates;
8. to rationalize migrational flows between city and country and between rural areas;
9. to concentrate the rural population in larger and more developed settlements;
10. to improve the access of rural areas to service centers;
11. to populate and develop sparsely populated regions;
12. to secure a dynamic equilibrium between society and nature;

13. to utilize rural recreational resources for urban visitors;
14. to rationalize the employment of the rural population in the economy;
15. to increase the diversity of job opportunities;
16. to improve the technical equipment employed in the agricultural sector;
17. to improve work schedules (daily, weekly, yearly);
18. to reduce the level of heavy work and to improve working conditions;
19. to expand housing construction;
20. to improve the quality and variety of everyday consumer goods;
21. to level the social status of men and women;
22. to develop recreational facilities;
23. to improve preschool facilities;
24. to raise the level of educational attainments of the population;
25. to stimulate social participation;
26. to eliminate crime.

This list can be viewed as a basis for constructing quantitative problem-oriented indicators for the development of rural regions. However, the data actually used was narrower in scope, because of a lack of statistical information. A list of indicators employed can be found in the Appendix.

1.3. Data Processing Methodology

The methods developed were used to construct composite indices of the acuteness of specific problems, to classify regions according to the acuteness of each problem under study, and to divide the regions into homogeneous groups characterized by different sets of critical problems.

The composite indices were constructed in two stages. The first involved analyzing a set of variables, selected by experts, for evaluating the acuteness of a certain problem using the algorithm for extreme clustering of parameters (Braverman 1970, pp.

123-133). As a result the true structure of each preliminarily formulated problem was clarified, the degree of the variables established, homogeneity estimated, and (in the cases initially formulated in which the problem appeared to have a complex structure) an appropriate number of relatively independent subproblems was determined. Concurrently, subsets of closely correlated variables describing the acuteness of each subproblem and suitable for use in constructing composite indices were identified.

The second stage involved the construction of problem indices according to the rural development directions. These indices were based on subsets of variables selected earlier using factor analysis, i.e. the 'main components' method (Harman 1972).

The next part of the analysis consisted in processing the indices by means of a classification algorithm (Dorofeyuk 1971). The axis of each index was broken down into the required number of ranged intervals. The classification was based on criteria of minimum weight average dispersion within classes.

The last part of the analysis was to treat the complete set of classifications with the multivariate classification algorithm; this was the ultimate purpose of the study. The multidimensional regional classification characterized by the acuteness of socio-economic problems can be made in either by using the ranks of one-dimensional classes within which the regions fell, or by using only the values of the problem indicators of each region. In the second case, the 'edges' of problem scales at which non-typical regions are situated play 2 decisive role. Therefore, the first method was chosen. Since there were no reliable criteria for ranking the various problems under study according to their significance, all indices were assumed to have the same weight.

Since the methodology used in this study is described in Zaslavskaya and Muchnik (1980, p. 344), we will not describe it here. Instead, we will continue with a survey of the study findings. The general results of the study were twofold: (a) a problem-oriented socio-economic typology of Soviet rural zones

was achieved, and (b) recommendations to policy-makers on the main directions of socio-economic policy for each type of region were proposed. This paper is based on these results. First, we present the socio-economic 'image' of each type of region, then the policy recommendations for its development.

2. PROBLEM-ORIENTED SOCIO-ECONOMIC CLASSIFICATION OF SOVIET RURAL REGIONS

2.1. The First Type: East Siberia, Kazakhstan, the Tuymen and Amur Provinces

This type includes 27 regions and forms a zone embracing almost half the Soviet territory. It is characterized by average climatic and natural conditions, a low level of economic development, and extremely low population density. Some areas are currently under development but the largest part is almost virgin territory. The density of the transportation network, cities, and villages is very low. Rural towns are large because poor intersettlement communications force people to obtain services in the place of residence. Per-capita provision of rural infrastructural facilities is the highest in this zone, but high-level services of an urban type are unavailable.

The distinctive demographic features of these regions are the very high birth rate and the advanced age structure. The level of rural-urban migration is average. The educational attainments of the population in this zone are rather high, falling only below the most urbanized seventh zone (see section 2.7). Female employment is low because of large family sizes, whereas male employment is extremely high. The result is a general labor shortage and a demand for male labor.

Agriculture, although extensive, is rather efficient, because the level of mechanization is the highest in the USSR. Per-capita (including the rural and urban populations) food production is at mid-level. The urban and rural industrial populations of these regions are increasing rapidly, therefore food demand is high and ever increasing. Satisfaction of this demand is impeded by poor transportation (especially demand for perishable products such as

fresh milk, eggs, meat, poultry, vegetables, fruit), it is therefore essential to expand local production. This would be possible if the agricultural sector did not have to compete for labor with geological prospecting, mining, the extraction industry, and transport. Given this situation, it is necessary to intensify rural social development in order to increase farm production.

The priorities for the long-term development program of this type of region are:

-- to increase agriculture intensity and efficiency in farming areas by improving the land, especially pastures;
-- to create a reliable all-the-year-round road network between the main urban centers and an airline network between cities and rural areas;
-- to develop urban services centers to satisfy the needs of the rural population (this should be the first priority);
-- to promote further growth of the rural social infrastructure;
-- to expand preschool facilities and to encourage greater female involvement in production.

2.2. The Second Type: The Ukraine (except the Donets Basin, and the Crimean and Trans-Carpathian regions), the Chuvash Autonomous Republic, the Belgorod and Voronezh Provinces

All the regions of this type with the exception of the Chuvash republic form one territorially connected zone, characterized by extremely high economic development, and includes a great number of villages and towns connected by a dense road network. The rich soils, mild climate, and high population density formerly made this zone the 'granary' of the USSR. The efficiency of agriculture today is also above the national average and accounts for the export of considerable quantities of food to other areas. However, the socio-economic production level is rather low: the rural employment structure is the most 'agrarian' of all the types of region, industrialization of

agriculture is undeveloped, agriculture-related and manufacturing industries operate at a relatively low level.

Slow technological progress is largely due to the age and sex structure of the population. For many years there has been an extremely high rate of young people migrating to the cities, this has led to an 'aging' of the rural population. The share of children, adolescents, and young people of working age is here is very low. Conversely, the share of persons of preretirement and retirement ages is very high. Women are predominant within the adult population. The corollary of the unfavorable age-and-sex structure is the low birth rate, leading to a further aging of the population. At present, outmigration of the rural population is not great, but the damage caused to rural demographic development by the outmigration of the young cannot be rectified over the short term.

The regions of this type have large rural settlements provided with various consumer facilities. However, the capacity of social infrastructure is often out of line with the population size of the settlements, and their residents are forced to obtain some services in urban areas.

In the long run, regions of this type should actively participate in the national food program because capital investments to farming in these regions are efficient. The orientation to accelerating the growth of agriculture may be hindered by an unfavorable demographic situation with quantitative and qualitative labor shortages. Therefore, in our view, the main goal of the program for this type of region is to reestablish the pattern of natural reproduction of the population. To achieve this goal it is necesary:

-- to accelerate the implementation and extend the scale of economic stimuli in order to increase the birth rate;
-- to attract young people from cities and other regions, by means of financial and social incentives and youth social organizations;
-- to accelerate the industrialization of agriculture and the development in rural areas of different

branches of manufacturing, construction, and transportation in order to provide a wider range of job opportunities and to increase labor productivity;

-- by these measures to heighten the contribution of these regions to tackling the country's food problem.

2.3. The Third Type: South West Siberia, the Urals, Volva Region, Stavropol Kraj, and Rostov Province

Eighteen regions of this type extend in a narrow band from the foothills of the Caucasus in the west to Mount Shoria in the east. In terms of economic development they lie between the second and the first types. The network of cities is rather thin, and most services are provided locally. This stimulates rural settlement concentration, but it is hindered by low population density, resulting in an average population size in most settlements. Accordingly, the level of services is low, especially because of poor access to cities. The largest outmigration is observed in remote areas with a low level of urbanization.

The demographic situation is rather favorable. Birth rates are close to rational, the ratio of men to women and the age structure are normal. The high level of outmigration of young people, however, is the reason for the low educational level of workers in this type of region and, in the long run, it threatens the demographic situation as a whole.

Most regions of this type are situated in the zone of hazardous agriculture with scarce and nonuniform precipitation. In spite of this, it leads in per-capita farm output (especially grain, milk, and meat). The land area per worker is 2 - 2.5 times that of the second type of region and, although the per-hectare yield is much lower, the economic efficiency of agriculture appears to be rather high.

As a result of their geographical position, the regions of this type provide the main supply of food for Siberia and the Far East. For this reason, they must play an important role in the food program of the USSR. In order to increase agricultural efficiency and farm output, it is necessary:

-- to expand gradually the irrigated area for fodder crops, creating a basis for increasing animal production;
-- to increase housing construction and service facilities in rural areas;
-- to form a system of small urban centers aimed at providing industrial and social services to the rural areas, and take steps to accelerate their growth;
-- to expand the road network and meet the requirements in regular transportation between rural and urban areas;
-- on the basis of all these measures, to achieve first a stabilization and then an increase of the rural population and labor force.

2.4. The Fourth Type: Byelorussia and the Nearby Provinces of the RSFSR

This type includes 16 regions forming a large zone with one spatially separated province. It is characterized by high level of development of the territory and is one of the major producers of farm products in the country. The technological level of agriculture is rather low. The employment structure is agrarian, technical equipment is comparatively poor, and the educational attainments of the workers lower than in most other types. A considerable share of food products is produced on private subsidiary plots. The efficiency of the state sector is not very high, although the natural and climatic conditions are in general favorable. Soil fertility is notably lower than in the second type of region, many areas requiring improvement. Demographically the fourth type is similar to the second one. The 'old' age structure is the result of high outmigration, which was in its turn due to the dispersed settlement pattern and a correspondingly low level of service provision. The settlement system is characterized by a dense network of rather small villages, each with 200-300 inhabitants. The transport network providing access to cities is inadequate. Therefore, this type ranks as one of the lowest in the level of services.

For these regions to make a substantial contribution to the implementation of the national food program, a number of difficult problems must be tackled. They include:

-- the implementation of an extensive program of soil improvement and liming;
-- the introduction of more efficient systems of crop and livestock production and of more modern equipment;
-- the gradual concentration of the population in key villages--collective and state farm centers (transforming uncomfortable hamlets and farmsteads into points of nonresidency farming);
-- cooperation between and integration of private and public farming on a mutually beneficial economic basis;
-- a reduction in labor inputs on private plots through minor mechanization, releasing part of the labor resources for the state economy;
-- in relation to the demographic situation--implementation of the steps recommended for the second type of region.

2.5. The Fifth Type: Central Asia, Caucasus, Moldavia, and Trans-Carpathian Provinces

This type includes 15 regions forming three zones separated by the Caspian and Black Seas. It covers the southern part of the country with a warm climate and a long frost-free period. A considerable part of its territory is occupied by mountain ridges or desert. Farming is highly intensive. Irrigated agriculture specialized in the cultivation of valuable warm season crops is carried out in the valleys, with extensive animal husbandry on the pastures of the mountain ridges.

The majority of rural residents are farm employees, although this branch does not provide employment throughout the whole year. The situation of a labor surplus is a disincentive to technological development, making it less imperative or indeed undesirable. The value of technical equipment per worker is the lowest in the country. Per-capita food production is also low

and cannot be raised because of the shortage of water and land. The efficiency of agriculture here is relatively low.

A distinctive demographic feature in this type of region is the very high birth rate combined with positive net migration, causing an extremely high gain in the size of the rural population. The age structure is advanced: the share of children and adolescents is high, that of the population of working age is of medium size, and of retirement age low. Among young adults, women prevail since young males tend to migrate to the cities. Some social inequality for women still persists here because of Islam ideology.

Rural population density and settlement patterns differ considerably between valley and mountain regions. In the densely populated valleys there are very large settlements, some of them with many thousands of residents, that almost join. On the contrary, in the mountains rural settlements are scarce and small. The system of service provision in valleys is generally of a high level but the per-capita provision of services is not so high as a result of rapid population growth.

The central problem for this type is the gap between economic and demographic development trends. This problem must be tackled from both sides, i.e., population and production. Accordingly, the major items in the long-term program of these regions should be the following:

-- socioeconomic measures aimed at increasing the outmigration of young people (especially females) to cities;
-- regular training of rural girls and boys in the skills demanded by urban industries;
-- economic incentives for one-, two-, or three-child families;
-- a series of measures aimed at achieving a more economical consumption of water in agriculture in order to increase the area of irrigated land and, thus, crop yields;
-- the transfer of a part of the flow of Siberian rivers to the Aral Sea basin, if this measure can be proved to be economic;

-- mechanization of the farm production process and the development of agricultural-related industries in rural areas;
-- securing of all-year-round employment for the working age population by locating labor-consuming industrial enterprises in rural areas.

2.6. The Sixth Type: The Nonchernozem Bank of the RSFSR

This type includes 11 regions that form a semi-circle around Moscow province to the north, west, and south. The share of the urban population here is high, manufacturing and construction are advanced, but agriculture is insufficiently developed. Employment of the rural population is of an agrarian-industrial nature and many people are employed in cities. The poor quality of the soil and the rather severe climate are responsible for the inefficiency of farming, resulting in a small output per unit area. Food production is insufficient to satisfy the local population, to say nothing of supplying Moscow. Agriculture suffers from a labor shortage, especially with respect to the more highly educated workers, who prefer to work in industry. Almost the entire labor force is employed in industrial production. The duration of the working year is longer than usual because workers are often forced to work overtime, owing to a lack of replacements.

The age structure is relatively old, and adult males prevail. The main problem in this type of region is the high rate of migration. Rural production (highly mechanized agriculture, manufacturing, construction, and transportation) demands mostly male labor and there are few skilled jobs for females, who as a rule migrate to cities. This shortage of 'fiancees' in turn pushes out the potential 'bridegrooms'.

The rural settlement system is dispersed with most of the population residing in hamlets of not more than 100-200 inhabitants. This entails a low capacity, limited choice, and low grade of services. The social situation is aggravated by the proximity of many cities with a high demand for labor.

In the long run, the rural areas of these regions will gradually acquire, under the impact of the metropolitan areas of Moscow and Leningrad, a more industrial image. These regions seem never to be able to feed their ever increasing populations without outside assistance. They can, however, almost satisfy their own needs in milk, eggs, potatoes, and vegetables. In order to achieve balanced socio-economic growth, it is necessary:

-- to intensify their agriculture to serve suburban needs;
-- to integrate agriculture directly with industry by converting some state farms into subsidiary farms of large urban enterprises. This will facilitate technological progress in agriculture, farm production growth, seasonal labor exchange between urban and rural areas, leveling of living conditions between villagers and the urban population;
-- to introduce measures for creating skilled jobs for women (by increasing in rural areas small industrial enterprises, services, handicrafts, home-work production, etc.);
-- in localities with sufficiently high population density, to increase the settlement concentration by stimulating the dwellers to move from small to large central settlements;
-- in areas with low population density to maintain existing villages by organizing mobile services and development of transport links between rural places of different types.

Most of these measures are included in the long-term program for the Nonchernozem rural areas, which was approved by the Central Committee of the CPSU and the USSR Council of Ministers in the early seventies. At present this program is underway.

2.7. The Seventh Type: The Most Urbanized Rural Regions

The regions of this type are situated in different parts of the USSR. They include the Moscow, Leningrad, Crimean, and Kaliningrad provinces as well as three provinces of the Donets Basin. Production in these areas is centered not so much around

agriculture as on manufacturing, construction, transportation, services, recreational facilities, research institutes, and various administrative departments. Agriculture employs less than half the rural dwellers. It is highly intensive, sufficiently provided with manpower, and highly mechanized, which account for the fact that it operates at the highest level of efficiency. Further expansion of production is impeded, however, by the land shortage, which is a result of the high level of urbanization of the territory. The production on private plots is less efficient since the same conditions do not apply. The involvement of the population in the economy is the greatest in the USSR in these regions, and the working year here is the longest.

The rural settlement pattern displays a dense network of medium-sized settlements unable to provide their population with a high level of services. Most services are obtained in the cities and the contrast between the life styles in a large city and in a small village creates a powerful force for city-ward migration. On the other hand, this type of region is very attractive for people residing in the more remote areas, and they willingly agree to establish their residence here. As a consequence, net migration is positive. The problem is that the growth of the rural population size is achieved at the expense of high changeability, and continuous renewal. The rural population is reproduced here not so much through natural increases as through migration, and this weakens the population's attachment to land, breaks traditional links, and impedes the formation of a skilled labor force. At the same time, the rural population is marked by the relatively young age structure, balance in the male-female ratio, and the high educational attainments of the population. Marriage and birth rates, however, are very low.

The opportunities for an extensive expansion of agriculture are limited if the cultivated land area continues to diminish. However, each hectar of land in these areas obtains high yields of greenhouse vegetables, fruit, berries, flowers, etc., although animal husbandry relies largely on imported fodder. A social condition for achieving greater agricultural efficiency is the formation of a stable labor force, and, hence, of a more

stable population. The development program for this type of region in our view should include:

-- the establishment of large production-commercial enterprises and firms integrating agriculture, manufacturing, storage, and the wholesale and retail trade in foodstuffs;
-- the concentration of settlement systems, and the construction of higher grade housing in rural areas;
-- measures aimed at enhancing the complementarity of rural and urban life styles, by fuller utilization of the benefits from proximity to natural recreational facilities as well as to the cultural resources of nearby metropolitan centers.

2.8. The Eighth Type: The Baltic Republics

In economic development of the territory this type falls only below the seventh type of region. Agriculture is advanced, it produces the highest per-capita volume of foodstuffs. Private plots of rural families are the largest in the country. The population is predominantly employed in farming, which is characterized by a high degree of mechanization and economic efficiency. The duration of the working year in the state sector of agriculture is below the average.

The demographic situation is similar to that in the Ukraine and the Nonchernozem regions. There is a large share of pensioners and a small share of children and adolescents. In educational attainments of the population, this type of region falls next to bottom. This is because of its 'old' age structure. Outmigration to cities is around the national average.

Rural social growth and life-style improvement are facilitated by a high level of rural-urban integration, a dense road network, regular transport links across the whole area. A negative aspect of social life is the extremely small size of the villages, multiple homesteads, and the dispersed nature of the social infrastructure. The level of locally rendered services in this type of region is almost the lowest in the USSR. Most services are obtained by rural dwellers in cities.

The Baltic republics play a very important role in tackling the food problem of the USSR, because they have achieved the highest agricultural performance without any benefits from the natural conditions. At the same time, they have some unused reserves for further increasing output by means of higher employment, and improvement of the land and agricultural systems.

The long-term program for the Baltic rural areas has some features in common with some types of region discussed earlier. In particular this relates to:

-- economic and social incentives to increase the number of births;
-- gradual voluntary resettlement of the population (financially supported by the state) from homesteads to large villages;
-- accelerated growth of social infrastructure in key central rural communities;
-- cooperation and integration of private subsidiary plots with the state agricultural sector;
-- reduction in the use of labor on private plots;
-- the development of labor-intensive industries in those villages in which labor demand is seasonal in character.

3. GENERAL CONCLUSIONS

We have described the direct results of the application of a problem-oriented demo-socio-economic typology to Soviet rural regions. In addition, we have reached three more general conclusions mainly of a methodological nature, which are outlined below.

A problem whose acuteness can be expressed by one composite index (which is a linear combination of some interlinked variables) is a convenient subject for quantitative evaluation and analysis. But every such problem characterizes only one specific aspect of a demo-socio-economic situation in different regions. Single-problem indicator values should therefore be considered only as specific socioeconomic symptoms of more complex integral situations. A similar situation

exists in the field of medicine, where certain diseases are identified by sets of typical symptoms. Each symptom taken individually is not sufficient for making a reliable diagnosis, because in conjunction with a variety of other symptoms it may indicate a number of different diseases. Just as in medicine where the subject of investigation is the disease not the symptom, in sociology and regional science the subject for study and classification should be the integral situation rather than the values of specific problem indicators.

The demo-socio-economic situation in certain regions on certain data may be considered as an integrated system of closely interlinked problems. Its elements--simple one-dimensional problems--may play different roles in the whole system standing out as problem causes, problem conditions or problem consequences. A problem (for example, too intensive rural-urban migration) in one situation may be a primary cause, in the second--a condition, in the third--a consequence of some other urgent problems. Long-term development programs should therefore take into account the inner structure of problem situations in every type of region and should attempt to find the best way of solving all interlinked problems. First, the key link in a situation should be detected, then the main attention should be focused on solving the key problem.

The methodology used in our study follows the approach described above. It appears to be an effective tool for defining complex demo-socio-economic situations in different countries, regions, towns, or other socio-spatial units. Below we outline three advantages of this methodology.

First, it makes possible a quantitative comparative evaluation of a problem's acuteness in different regions (or their types). As a result of processing data by factor analysis, we received quantitative values for the indicators of each region. These are abstract and are normalized by an average dispersion of indicators along their axes. In addition, we can obtain more aggregated evaluations, by classifying regions according to the urgency of each problem. The classes into which the 130 rural regions of the USSR have fallen according to the values of 26 problem indicators are shown in the Appendix.

Second, the methodology allows the acuteness of different problems of one region (or in one type of region) to be quantitatively evaluated and compared with those of other regions. The degree of a certain problem's urgency in a region is expressed by the range of classes to which this region belongs. Since the degree of urgency in a certain type of region is expressed by the average range of classes for all regions of the type, every type may be described by a 26-dimension vector, whose elements are values of average ranges for this type of region along the axes of the problem indicators (Table 1).

To have a better understanding of Table 1, one should take into account two factors. First, the classification of regions was obtained by processing data on all 130 administrative units of provincial levels of the USSR. Nine of these units appeared to have no relation to the agrarian sector of the national economy and were therefore omitted in the analysis. However, the average ranges for the agrarian regions on the axes of some indicators (3, 4, 8, 9, 10, 14, and others) were markedly influenced by the fact that non-agrarian regions were classified simultaneously. Secondly, the indicators of problem urgency constructed for our study can be broken down into two groups. One group may be termed 'single-poled' and the other--'two-poled'. The single-poled group are, for example, problems of a lack of educational attainments, low arable productivity, and so on. The worst situation here appears to be in regions belonging to the first class and the best in regions belonging to the fifth class. Two-poled problems, for example, relate to female-male imbalance in the population, insufficient or too intensive employment of the population in the economy, etc. In this case the best place for a region is midway between both scales, whereas the ends of the scale show one or the other variant as having an urgent problem.

Using the method outlined above, one or two 'problem areas' were defined on the scales of each indicator. The region whose average ranges fell into 'problem areas' (or near to them) were considered as having similar problems. In order to facilitate analysis of the data given in Table 1, the values of ranges close to 'problem areas' are denoted by a negative sign.

Table 1. The average ranges of the classes in which each type of region belongs.

PROBLEM INDICATORS	TYPES OF REGION							
	I	II	III	IV	V	VI	VII	VIII
1. Economic development of a territory	-2.1	4.3	-3.1	3.8	3.7	3.3	4.5	4.0
2. Spatial concentration of activity	-2.0	4.1	-2.9	3.8	3.8	3.2	4.5	4.0
3. Accessibility to urban centers	-1.3	2.7	-1.7	2.5	2.5	-2.4	3.7	3.0
4. Share of workers employed in agriculture	2.8	-4.8	3.8	-4.4	-4.3	3.3	3.1	4.0
5. Per capita food production (rural population)	2.8	3.1	3.6	3.1	-1.2	3.0	4.2	5.0
6. Per capita food production (rural and urban population)	2.7	3.7	3.1	3.9	-1.5	-2.2	-1.9	4.7
7. Private plot productivity	-2.3	3.7	3.0	-4.1	-2.1	3.4	-2.9	-5.0
8. Agricultural labor productivity	3.5	-2.9	3.5	-2.7	-2.0	-2.5	3.7	4.0
9. Agricultural equipment	3.4	-1.4	2.5	-1.3	-1.3	-2.0	2.4	2.7
10. Agricultural land productivity	-1.2	2.2	-1.0	2.2	2.3	-1.7	2.4	2.4
11. Agricultural capital efficiency	-2.9	4.3	3.6	4.3	-3.0	-3.0	3.2	-2.0
12. Average size of rural settlements	3.7	4.2	3.3	2.2	4.5	-1.5	3.1	-1.0
13. Spatial density of rural social infrastructure	-1.1	3.9	-2.3	3.1	3.3	-2.1	2.6	-2.3
14. Per capita services	3.2	-1.7	2.6	-1.4	-1.4	2.2	2.1	-1.4
15. Social infrastructure per settlement	3.0	3.9	3.0	-1.5	3.9	-1.1	-1.9	-1.0
16. Capacity of social service enterprises	3.1	2.4	2.5	-1.7	3.6	-1.3	2.3	-1.3
17. Share of labor resources employed in the economy	-2.1	-4.0	2.9	3.6	2.4	3.8	3.6	3.0
18. Duration of working year in agriculture	-4.4	2.8	3.3	-2.4	-2.6	3.8	-4.0	-1.7
19. Net out migration	2,6	2.7	-1.4	-1.4	-4.1	-1.1	3.3	3.4
20. Birth rate	3.6	-1.4	2.3	1.7	-4.1	-1.4	-1.2	-1.3
21. Share of children and adolescents	-4.6	-1.7	3,6	2,7	-4.4	2.6	2,6	-1.3
22. Share of young adult population	1.8	-1.3	1,5	-1.1	-1.4	1.7	2.6	-1.4
23. Share of older population	1.4	-4.2	3.2	-4.0	1.5	-4.3	3.4	-4.7
24. Female to male ratio for young adults	3.4	-4.0	3.2	3.0	-4.7	-2,2	3.4	3.0
25. Female to male ratio for older population	2.8	-3.9	-3,9	-4.1	2.1	-4.6	3.5	3.0
26. Education attainments of population	3.2	2.4	2.3	-1,7	2.9	-2.0	3.4	-2.0

Third, the methodology allows the comparative urgency of specific groups of problems in certain regions (or their types) to be evaluated in quantitative terms. For a clarification of this statement, see Table 2. The most complex demo-socio-economic situation is found in the sixth type of region (Nechernosem zone), with the fifth type (middle Asia, Caucasus, and some other regions taking second place). The third and the seventh types have the most favorable conditions for social and economic development. The others occupy a middle postion.

Table 2. The acuteness of specific groups of problems in different types of region (the number of urgent problems in a certain type of region is represented as a ratio of the average number in all regions of the USSR).

GROUPS OF PROBLEMS	TYPES OF REGION								ALL TYPES
	I	II	III	IV	V	VI	VII	VIII	
Population reproduction and structure	0.2	1.5	0.5	1.2	1.2	1.7	0.5	1.2	1.0
Employment and labor	0.9	1.7	-	0.9	1.7	1.3	0.4	0.9	1.0
Settlement and services	1.3	0.4	1.3	1.3	1.4	1.7	-	1.7	1.0
Agricultural production	1.5	1.4	0.4	0.8	1.9	1.5	0.8	0.8	1.0
TOTAL	0.9	1.1	0.5	1.1	1.3	1.6	0.4	0.4	1.0

The data in Table 2 indicate substantial differences in the structure of typical problems in different parts of the country. For the first type of region the most urgent problems are those of agricultural production and settlements and services. Whereas for the second type, those of employment, labor, and agriculture are the most acute. The third type suffers from underdeveloped settlements and services only. The sixth type has a wide variety of problems, but those of settlement services and population

reproduction are the most acute. The fifth type also suffers from many different problems. The most complex problems here are to be found in the agriculture, employment, and labor situation. In the sixth type of region many different problems exist in a more acute form than in the 'average' regions of the USSR. The most urgent are those relating to demographic, settlement and services conditions (as in type 4). In the seventh type, many problems exist but in a weak form. Those of settlement and services are almost absent. Only those problems related to the extension of agricultural development are relatively significant. Finally, for the eighth type, settlement, services, and population reproduction problems are the most critical.

Thus, the general conclusion is that the methods used in our study allow us to detect typical sets of problems and to gather regions with similar demo-socio-economic conditions into large homogeneous groups requiring specific programs of development.

APPENDIX. The general results of a one-dimensional classification of the rural regions in the USSR by the comparative urgency of 26 demo-socio-economic problems.

Names of regions	Ranges of classes by problem indicators[a]																									
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26
1 Archangelsky	2	1	2	2	1	1	1	2	2	2	1	2	1	4	1	2	4	4	1	2	4	2	3	2	4	3
2 Bologodsky	3	2	3	3	2	2	3	2	2	2	2	1	1	3	1	2	4	4	1	2	3	1	4	2	5	2
3 Leningradsky	3	3	3	2	4	1	3	4	3	3	1	2	1	3	1	3	4	4	5	1	2	3	4	4	4	4
4 Muzmansky	2	1	2	1	1	1	1	5	4	5	1	4	1	1	2	3	4	1	5	1	1	5	1	1	3	5
5 Novgorodsky	3	3	2	3	3	3	4	2	2	2	2	1	2	3	1	1	4	4	1	1	2	1	5	2	5	2
6 Pskovsky	3	3	3	4	4	5	5	2	1	2	3	1	2	2	1	1	4	3	2	1	1	1	5	2	4	1
7 Karelsky	2	2	2	1	1	1	1	4	3	3	2	3	1	4	2	2	5	5	1	2	3	4	2	1	3	3
8 Komy	2	1	1	1	1	1	1	1	2	2	1	3	1	4	3	3	5	4	3	3	3	3	2	1	3	4
9 Bryansky	4	4	2	5	3	3	4	3	1	2	4	2	3	1	2	3	4	2	1	2	3	1	4	3	5	1
10 Vladimirsky	4	4	3	2	3	2	3	3	2	2	3	2	3	2	1	1	4	4	2	1	3	2	4	4	4	3
11 Ivanovsky	4	4	3	3	3	2	3	3	2	2	2	1	3	2	1	1	4	4	1	1	2	2	5	2	5	2
12 Kaliningzodsky	3	3	2	4	4	4	4	3	2	2	3	1	2	2	1	1	4	4	2	1	1	1	5	2	5	2
13 Kalugsky	4	4	3	3	3	3	4	2	2	2	2	2	3	2	1	1	4	4	1	1	3	1	4	3	5	2
14 Kostromskoy	3	3	3	3	2	2	3	2	2	1	2	1	2	2	1	1	4	4	1	1	3	2	5	2	5	2
15 Muscovsky	5	5	5	1	3	1	1	4	3	3	2	3	4	3	1	4	4	4	4	1	2	3	4	3	4	4
16 Ozlovsky	4	4	3	5	3	5	4	3	2	1	3	2	3	1	1	2	4	3	1	1	3	1	4	2	4	2
17 Ryasansky	4	4	3	4	3	4	4	3	2	2	2	2	3	2	2	1	3	3	1	1	2	1	5	2	4	2
18 Smolensky	3	3	3	4	4	5	5	3	2	2	3	1	3	2	1	1	4	4	1	1	2	1	5	2	5	2
19 Tulsky	4	4	3	4	4	2	4	3	2	2	2	2	3	1	1	1	3	4	1	1	2	2	5	3	4	2
20 Yaroslavsky	3	3	3	4	4	2	4	3	2	2	3	1	2	2	1	1	4	4	1	1	2	1	5	2	5	2
21 Gorkovsky	4	3	2	4	3	2	4	2	1	2	3	3	3	2	2	2	3	3	1	1	3	1	4	3	5	1
22 Kirovsky	3	3	1	4	3	3	3	2	2	1	2	1	2	2	1	1	4	3	1	2	3	1	4	2	5	2
23 Mariysky	3	3	3	4	2	3	3	3	1	2	3	2	3	2	1	3	4	2	2	3	4	1	3	4	5	2
24 Mordovsky	4	4	2	4	2	3	3	2	1	1	2	3	3	1	3	3	2	3	1	3	4	1	3	3	5	2
25 Chouvaschsky	4	4	2	5	2	2	3	2	1	2	3	3	5	2	3	4	4	1	2	3	4	1	3	4	5	3
26 Belgorodsky	4	4	2	5	3	5	4	3	2	2	3	3	4	2	3	2	4	3	1	1	2	1	5	4	5	2
27 Voronegsky	4	3	2	4	3	3	3	4	2	2	3	4	3	2	3	2	3	3	2	1	2	1	5	3	4	2

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	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26
28 Kursky	4	4	2	5	3	4	4	3	1	2	3	3	4	1	2	2	4	3	1	2	3	1	4	3	4	2
29 Lipecky	4	4	2	4	3	4	3	3	2	2	3	3	4	2	2	2	3	3	1	2	3	1	4	3	5	2
30 Tambovsky	4	4	2	4	3	4	3	3	2	2	3	3	3	2	2	2	2	3	1	2	3	1	4	2	4	2
31 Astrahansky	3	3	2	2	2	2	1	4	3	2	2	4	2	4	3	4	3	4	3	3	4	2	2	3	3	3
32 Volgogradsky	3	3	1	4	5	3	2	4	3	1	3	3	2	3	2	2	2	3	2	2	3	1	4	4	3	3
33 Kaurbyshevsky	3	3	2	3	4	2	3	4	3	1	2	4	3	3	3	3	3	3	2	2	3	2	4	3	3	3
34 Pensenskt	3	3	2	4	3	3	3	3	2	1	3	3	3	2	3	3	3	3	1	2	3	1	4	3	4	2
35 Saratovsky	3	3	1	5	5	3	3	3	3	1	2	3	2	2	3	1	3	4	1	2	3	1	4	3	4	2
36 Ulyanovsky	3	3	2	4	3	3	3	4	2	1	3	4	2	2	3	2	3	3	1	2	3	1	4	3	4	2
37 Bashcizvky	3	3	1	4	2	3	3	3	2	1	3	3	2	2	3	3	3	2	1	3	4	1	2	4	4	2
38 Kalmycky	2	2	1	3	3	4	3	3	3	1	2	4	1	4	5	2	2	4	2	3	4	2	1	3	2	2
39 Tatarsky	3	3	1	5	3	3	3	3	2	1	3	3	3	2	3	3	4	3	2	3	4	1	3	4	5	3
40 Krasnodarsky	4	4	2	4	3	4	2	4	2	3	3	5	3	3	4	4	3	3	4	1	2	2	4	4	3	3
41 Stovropolsky	3	3	3	3	3	4	2	4	2	1	3	5	2	3	4	4	3	3	4	2	3	2	3	4	3	3
42 Rostovsky	3	3	2	4	4	3	3	4	3	1	3	4	2	3	3	2	3	4	3	1	2	2	4	4	3	3
43 Dagestansky	3	3	2	5	1	1	2	1	1	2	1	4	3	2	4	3	3	1	3	5	5	1	1	5	3	1
44 Kabardinsky	4	4	4	3	2	2	3	3	2	2	2	5	3	1	4	5	2	2	4	4	5	2	2	4	3	3
45 Osetinsky	4	4	4	3	2	2	3	3	2	2	3	5	3	2	4	5	1	2	3	3	4	2	2	4	3	4
46 Chechensky	4	4	3	3	1	1	2	2	2	2	2	5	3	2	4	5	1	3	4	4	5	1	1	5	2	1
47 Kurgansky	3	3	2	4	4	5	2	4	3	1	3	3	2	3	3	2	3	4	1	2	4	2	3	3	4	2
48 Ozenbourgsky	3	3	1	4	4	4	3	4	3	1	3	3	2	3	3	2	3	3	1	3	4	1	3	3	4	3
49 Permsky	3	3	2	3	2	1	3	2	2	1	2	2	2	3	1	2	4	3	1	2	4	2	3	2	4	2
50 Sverdlovsky	3	3	2	2	3	1	3	3	2	2	2	3	1	2	2	2	3	4	1	2	3	2	3	2	3	2
51 Chelyabinsky	3	3	3	3	4	2	3	4	3	1	2	3	2	3	3	3	2	4	1	2	4	2	3	3	3	2
52 Udmourdsky	3	3	2	4	2	2	3	2	2	1	2	2	3	2	2	3	4	3	1	3	4	1	3	3	5	2
53 Altaysky	3	2	1	4	4	4	3	4	3	1	3	4	2	3	3	3	3	3	1	2	4	2	3	3	4	2
54 Cemerovsky	3	3	2	3	5	1	5	4	3	1	3	3	2	3	3	2	2	4	1	2	4	2	3	2	3	2
55 Novosibirsky	3	2	2	3	4	3	4	4	3	1	2	3	2	3	4	2	3	4	1	2	4	2	3	3	4	2
56 Omsky	3	2	1	4	4	4	3	4	3	1	2	3	2	3	3	2	3	4	1	3	5	2	2	3	4	2
57 Tomsky	2	2	2	2	2	2	3	3	3	1	2	3	1	4	3	3	2	4	1	2	4	2	3	2	3	3
58 Tuymensky	2	2	1	2	2	3	2	3	3	1	2	3	1	4	3	2	3	4	3	3	4	2	2	3	4	2
59 Czasnoyarsky	2	2	1	2	3	2	3	4	3	1	2	3	1	4	4	2	2	4	1	2	4	2	3	2	3	2
60 Trcoutsky	2	2	1	2	3	1	3	3	3	1	2	3	1	3	3	2	2	4	1	3	5	2	2	2	2	2

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	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26
61 Cheitinsky	2	2	1	2	3	2	3	3	3	1	2	4	1	3	4	3	2	3	2	3	5	3	1	2	3	3
62 Bouryatsky	2	2	1	2	2	2	2	2	3	1	2	4	1	3	4	3	3	4	3	3	5	2	2	2	3	3
63 Touvinsky	2	2	1	3	2	2	2	2	2	1	2	4	1	4	2	3	3	4	3	4	4	2	1	4	1	2
64 Primorsky	2	2	1	2	3	1	2	3	3	2	1	4	1	3	4	3	3	4	3	2	3	4	2	2	2	4
65 Chabarovsky	2	2	1	1	1	1	2	3	3	2	1	4	1	4	4	2	4	5	4	2	3	4	2	1	2	4
66 Amoursky	2	2	1	3	4	3	3	4	4	1	2	3	1	4	4	2	3	4	4	3	4	3	2	2	2	3
67 Camchatsky	1	1	2	1	2	1	1	2	3	3	1	4	1	5	5	3	5	3	5	2	2	4	1	2	1	5
68 Magadansky	1	1	1	1	2	1	1	1	3	4	1	3	1	4	3	2	5	3	5	1	1	4	1	1	1	5
69 Sachalinsky	2	3	1	1	2	1	2	3	3	4	1	3	1	4	3	2	4	5	1	2	4	4	2	2	2	4
70 Yacoutsky	1	1	1	2	1	1	1	1	2	1	1	4	1	5	3	2	2	5	3	4	5	2	1	4	2	4
71 Voroshilov-gradsky	5	5	4	4	5	2	3	4	2	2	3	4	2	2	3	2	2	4	3	1	2	2	4	2	4	3
72 Dnepropetrov-sky	4	4	3	5	5	2	4	4	2	2	3	4	3	2	3	2	4	4	2	1	1	1	5	3	4	3
73 Donecky	5	5	4	4	5	1	4	4	2	2	3	4	3	2	3	2	3	4	3	1	2	2	4	3	3	3
74 Saporoghsky	4	4	3	5	5	3	3	4	2	2	3	4	3	3	4	2	5	4	3	1	2	1	4	3	4	3
75 Ceirovogradsky	4	4	3	5	4	5	4	4	2	2	4	4	4	2	4	2	5	3	3	1	1	1	5	4	4	3
76 Poltavsky	4	4	3	5	4	5	4	3	1	2	4	4	4	2	3	2	4	3	3	1	1	1	5	3	5	3
77 Soumskoy	4	4	2	5	3	4	4	2	1	2	4	4	4	2	3	2	4	3	2	1	1	1	5	3	4	2
78 Harkovsky	4	4	3	4	4	2	4	4	2	2	3	3	3	2	3	2	4	4	2	1	1	1	5	3	4	3
79 Vinnicky	5	5	2	5	2	4	4	2	1	3	4	5	5	1	5	3	4	3	2	1	2	1	5	4	5	2
80 Volynsky	4	4	2	5	2	4	4	2	1	2	3	4	4	1	4	2	4	1	3	2	2	2	3	5	3	1
81 Jetomirsky	4	4	3	5	2	3	4	2	1	2	3	4	4	1	4	2	3	2	2	2	3	1	4	4	4	3
82 Lacarpatsky	5	5	2	4	1	2	3	1	1	3	1	5	5	1	5	3	4	2	4	3	3	2	2	5	2	3
83 Ivano-Francov-sky	5	5	3	4	1	2	3	1	1	2	2	5	5	1	5	3	3	1	4	2	2	2	3	5	3	1
84 Kievsky	4	4	3	4	3	2	4	3	1	3	3	5	4	1	4	3	4	2	3	1	1	2	5	4	4	3
85 Lvovsky	5	5	4	4	2	2	4	2	1	2	2	4	5	1	4	2	3	2	3	3	3	1	2	5	3	2
86 Rovensky	4	4	3	5	2	3	4	2	1	2	3	4	4	1	4	3	4	2	3	3	2	2	3	5	3	1
87 Ternopolsky	5	5	2	5	2	4	4	2	1	3	3	5	5	1	5	2	5	3	3	2	1	1	4	5	4	1
88 Hmelnycky	5	5	3	5	2	4	4	2	1	2	3	4	5	1	5	2	4	3	2	1	2	1	4	4	4	3

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		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26
89	Chercassky	5	4	3	5	3	4	4	3	1	3	4	5	4	2	5	3	4	3	3	1	1	1	5	4	5	3
90	Chernigovsky	4	4	2	5	3	5	5	2	1	2	3	4	4	1	4	2	4	2	2	1	1	1	5	4	5	2
91	Chernovitsky	5	5	5	5	2	3	4	2	1	3	3	5	5	1	5	3	4	2	4	2	2	2	3	5	3	2
92	Chymsky	4	4	3	4	4	3	2	3	2	3	2	4	3	2	3	3	5	4	4	2	3	3	2	5	3	4
93	Nicolaevsky	4	4	3	5	5	5	3	4	2	2	4	4	3	2	4	2	4	4	2	1	2	2	4	4	3	3
94	Odessky	4	4	2	5	4	3	3	3	1	2	3	5	3	2	4	3	5	3	4	1	2	2	4	5	3	2
95	Hersonsky	4	3	3	5	5	5	3	4	2	2	3	4	3	2	4	2	4	4	4	2	2	2	3	4	4	3
96	Litovsky	4	4	3	5	5	5	5	3	2	2	1	1	3	1	1	1	2	1	2	2	2	1	4	4	3	1
97	Latvuisky	4	4	3	4	5	4	5	4	3	2	1	1	2	1	1	2	4	2	4	1	1	1	5	3	3	2
98	Estonsky	4	4	3	3	5	5	5	5	3	3	2	1	2	2	1	1	3	2	4	1	1	2	5	2	3	3
99	Caliningradsky	5	5	4	4	5	3	4	4	3	2	2	2	2	1	1	1	3	4	2	1	4	3	2	3	3	3
100	Grousinsky	4	4	2	5	1	1	4	1	1	3	1	4	4	1	3	2	2	1	4	3	3	2	2	5	2	4
101	Aserbayd-gansky	4	4	2	5	1	1	2	1	1	2	2	4	4	1	4	2	1	3	4	5	5	1	1	5	2	3
102	Armyansky	4	4	3	5	1	1	2	1	1	2	1	5	4	1	5	3	2	3	4	5	5	1	1	5	2	3
103	Usbecsky	3	3	3	5	1	1	1	2	1	3	3	4	3	2	2	5	3	4	5	5	5	1	1	5	2	4
104	Cyrgizsky	3	3	1	4	1	2	1	2	1	2	2	4	2	2	3	5	3	3	4	5	5	1	1	4	2	4
105	Tagicsky	3	3	2	5	1	1	1	2	1	3	3	4	2	1	2	3	1	3	5	5	5	1	1	5	1	3
106	Tourcmensky	2	3	2	5	1	1	1	2	2	3	3	4	1	1	4	3	3	4	5	5	5	1	1	5	2	4
107	Actyubinsky	2	1	1	3	3	3	2	4	4	1	2	3	1	3	1	3	2	5	4	4	4	1	1	4	3	4
108	Alma-Atinsky	2	2	3	2	2	2	2	3	2	1	4	5	2	3	4	5	2	4	5	4	5	2	1	4	2	4
109	Vostochno-Kazachsky	2	2	3	3	3	2	3	4	3	1	3	4	1	3	4	4	1	5	2	3	4	1	2	3	3	3
110	Gouryevsky	2	1	2	3	1	1	1	5	4	4	3	3	1	3	2	4	2	5	2	5	5	1	1	4	3	4
111	Dgambulsky	2	3	1	3	2	2	2	3	2	1	4	5	2	3	4	5	2	4	3	4	5	1	1	4	3	4
112	Caragandinsky	2	2	1	3	4	1	3	3	4	1	1	3	1	1	1	3	2	5	2	4	4	2	1	4	2	4
113	Czyl-Ordinsky	2	2	2	3	1	1	1	4	3	2	3	4	1	2	2	3	1	4	3	5	5	1	1	4	2	4
114	Cocchetavsky	3	2	1	3	4	5	2	4	4	1	2	4	1	3	4	3	3	5	2	4	5	2	1	4	3	3
115	Coustanaysky	2	2	1	3	4	5	2	5	5	1	1	4	1	3	4	3	2	4	2	4	5	2	1	5	4	3
116	Pavlodczsky	2	2	1	4	3	3	2	4	4	1	1	4	1	3	2	3	2	5	2	4	5	2	1	4	3	3
117	Severo-Kazachsky	3	2	2	3	4	5	3	4	4	1	2	4	2	3	4	3	2	5	2	3	5	2	1	3	3	3

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		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26
118	Semipalatinsky	2	2	1	3	3	3	2	5	3	1	3	3	1	3	1	4	2	5	2	4	5	1	1	3	2	3
119	Taldy-Curgansky	2	2	1	4	2	3	2	3	2	1	4	5	1	3	4	4	3	3	4	4	5	2	1	3	2	3
120	Tourgaisky	2	2	1	3	4	5	2	4	5	1	1	4	1	3	3	3	1	5	4	4	5	2	1	5	4	4
121	Uralsky	2	2	1	4	3	4	2	4	4	1	2	3	1	3	1	3	2	5	4	4	4	1	1	4	3	4
122	Celinogradsky	2	2	1	3	4	4	4	4	5	1	1	4	1	3	3	3	2	5	2	4	5	3	1	5	5	3
123	Chimkentsky	2	3	2	4	1	2	1	4	2	1	5	4	3	2	4	4	2	4	4	5	5	1	1	3	1	4
124	Brestsky	4	4	2	5	3	4	4	2	1	2	4	3	3	1	2	2	4	1	2	2	3	2	3	4	3	1
125	Vitebsky	4	4	3	5	4	4	5	3	1	2	3	1	3	1	1	1	3	2	2	1	2	1	4	3	4	2
126	Gomelsky	4	4	3	4	3	4	5	2	1	2	3	3	3	1	2	2	3	2	1	2	3	1	3	4	4	2
127	Grodnensky	4	4	2	5	3	4	4	2	1	2	3	2	4	1	1	1	5	1	2	2	2	1	4	4	3	1
128	Minsky	4	4	2	4	3	3	4	3	1	3	3	2	3	1	1	2	4	2	3	2	3	1	4	3	3	1
129	Mogilevsky	4	4	3	5	3	4	5	3	1	2	4	2	3	1	1	1	3	2	1	2	3	1	4	3	4	2
130	Moldavsky	5	5	3	5	2	2	2	3	1	3	3	5	5	1	5	4	5	2	4	3	4	2	2	5	2	1

[a] For a clarification of the indicators, see Table 1.

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