REGIONAL TYPES OF CENTRAL AND PART OF LOWER BASIN OF THE NITRA

(REGIONÁLNE TYPY STREDNÉHO A ČASTI DOLNÉHO PONITRIA)

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In the foreign geographic literature lot of papers may be found recently methodology of which is bound to the use of the computers. ČSSR lags in this way very much behind. At the department of economic geography of the faculty of Natural Science of the Komenský University in Bratislava we have tried to use, for the first time, the electronic machine ODRA — 1013. In the literature the papers where factor analysis is used are very frequent (B. J. L. Berry, 1960, 1961; C. A. Moser, V. Scott, 1961; D. M. Ray, B. J. L. Berry, 1964; V. M. Žukovskaja, 1964; D. Steiner, 1965; T. Czyz, 1967; W. Zelinski, 1970; L. Hautamäki, 1970, 1971). As this method is very highly evaluated, we have decided to use it as well. The principal elements on methodology in our work have been:

1. The centroid model of factor analysis by L. L. Thurstone (1947).
2. The grouping analysis by B. J. L. Berry (1961). We use the group analysis as it relates to the factor analysis, and it is. after our opinion, one of the most sensitive typological methods.

We have tested the area covering the districts of Topoľčany, Nitra and a part of the district of Nové Zámky (G = 5,126; Map 1). It is the central and a part of the lower basin of the Nitra in the southwestern part of Slovakia. The area comprises 282 elementary units. It is mostly of agricultural character; therefore we have decided to choose more parameters from this economic category. There is relatively lack of statistical data for such small units and as we wanted to characterize this area more complexly we were obliged to use the statistic material from the years 1961 and 1968.

We have chosen these variables:

1. % of sown area of wheat of the total arable land in the same administrative unit (on 1st May 1968).
2. % of sown area of rye " "
3. % of sow:: area of barley
4. "o of sown area of maize "
5. % of sown area of leguminous plants
6. % of sown area of potatoes
7. % of sown area of forage " "
8. % of sown area of oil-plants
9. % of sown area of fiber-plants
10. % of sown area of sugar beet
11. % of sown area of tobacco
12. % of sown area of vegetable
13. Number of sheep per 100 ha of agricultural land in each administrative unit (on 1st May 1968).
14. Number of black cattle per 100 ha of agricultural land in each administrative unit (on 1st May 1968).
15. Number of hogs per 100 ha of arable land in each administrative unit (on 1st May 1968).
16. Share of employed people in industry of the total number of economically active people in each administrative unit (on 1st May 1961).
17. Share of employed people in agriculture " "
18. Share of people employed in the locality of residence
19. Share of people employed in other branches
20. Density of population in each administrative unit (on 1st March 1961).
21. Retail turnover in the year 1968 to the amount of population on 1st March 1961.

The input matrix for the factor analysis is the type 282/21. The first auxiliary calculation in the factor analysis is the calculation of correlation coefficients of all possible combinations of parameter pairs which form correlation matrix C_0 (Tab 1). The so called factor matrix F (Tab 2) has to be calculated, and the following must hold:

$$F * F' = C_0$$

F' is the transposed matrix to the factor matrix F.

The equality introduced above is the basic equation of the factor analysis. The correlation matrix is often the first, object of the analysis. It is evident, observing the elements of the matrix C_0, that the parameters are highly uncorrelated. This property is very important for the typology because the types remain multidimensional. This property, with such a great number of elements, has complicated our work to a great extent.

We have succeeded to condense the number of parameters into 6 variables — factors by mean of the factor analysis and Saunders' criterion. The first two factors condense together 50,2 % of the reached common dispersion (F 1 — 23,7 %; F II = 26,5 %). The first factor, after our opinion, represents the dimension of the total economical standard and differences of agricultural production types (potatoes production type on one hand and maize and sugar beet types on the other hand).

Interpreting the factors we come out from the factor matrix.

The second factor represents the dimension of differences of employment of population. The two other factors condense 29,1 % of achieved common dispersion (F III — 13,0 %; F IV — 16,1 %). The third factor represents the complement to the factor I as it characterizes the differences between maize and sugar beet production type. The factor IV helps to analyze the differences in the structure of different production types. In the last two factors the causality of relations and orientation of parameters disappears. These factors are called the dimension of complement differences.

The matrix 282/21 was submitted to standardization and by multiplying it by the factor matrix of the type 21/6 we got the coordinates of elementary units in the factor space. According to each factor we got 5 regional types so that we divided the factor coordinates axes into 5 intervals and from the orthogonal projection on the coordinate axes were form oil the maps of score to each factor. (Map 2 - 7).

The map of correlations of the regional average (Map 8) is a. complex, picture of the whole area. Each administrative unit has, in respect to the factors, 6 coordinates reflecting all-regional aspects owing to standardization. The linear combination represented the each, of these coordinates is a picture of inner differences. Owing to these facts average mean is the value representing the whole complex of differences in the tested area. The elementary units structure of which correlates with the vector $_a$ have evidently such differences in their inner structure which are equivalent to the differences represen fating the whole area, or to the differences most frequent in the whole set with 282 elements. These elementary units are to be found mostly in the northern part of the tested area. The number and size of the elementary units in this part caused that the differences in structure of administrative units in the southern part got to another qualitative plane and therefore there is a higher number of elementary units with a negative correlation bound with the vector in this region.

Having used the grouping analysis in a smaller tested area composed of 30 administrative units we came, to the conclusion that the optimum division of this set is the division into 5 subsets representing 5 regional types. (Scheme 2, Graph 1, Map 9).

Type I. Nitra as an independent regional type behaves quite regularly. It differs very sharply from other elementary units in this tested area by its structure of sown areas, by its structure of animal production, but mainly by its recent social parameters.

Type II. Here belong the administrative units around Nitra, but only these having the most advantageous traffic communication. The road from Bratislava and railways from Leopoldov, Radošina and Topoľčany gave rise to a vaste field to the north-west of Nitra.

Mostly agrarian are the regional types of the third, fourth and fifth category.

Type III. The parameter structure of the administrative units of this type are orientated mainly to animal production.

Type IV. This type may be called suburban agrarian type as it is a unit clearly orientated to vegetable production.

Type V. The orientation of agriculture to vegetable production, mainly to growing of wheat and maize (market gardening is also significant) is typical for this type. The particularity of this type is the concentration of those elementary units the population structure of which is mostly Hungarian.

This specification is conditioned by the traditional orientation of the Hungarian population to agriculture, mainly to vegetable production.

In the conclusion we have to state, in agreement with Steiner (D. Steiner, 1965, page 33) that the results are influenced by the chosen parameters and size of the tested units. The results are evidently dependent on the number of elements, i. e. on the input matrix. In the case of higher number of tested units it is possible to make an analysis only on the general level.

From Slovak translated by dr. D. Smrčinová