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THE ATTEMPT TO DELIMITATE TORUŃ'S INFLUENCE ZONES ON THE GROUNDS OF THE ANALYSIS OF POPULATION FLOW

ABSTRACT. The article attempts to delimitate the zones of Toruń's influence on the grounds of the multiaspect analyses of the phenomena of the town's influences. The results of the detailed empirical investigations of migration burden served as a base for the delimitation of the zones of Toruń's influence. These studies were carried out in the years 2000–2002 and involved examining permanent migrations, commuting, spatial origin of the students of secondary schools, the Nicolaus Copernicus University and the Gen. Józef Bem Higher Officers' School, and visits for tourist, social and living purposes. Due to the evaluation of the size and intensity of the population flow and contact frequency, three zones of the town's influence were delimited. The functional and spatial relations found within those zones were also characterised.

KEY WORDS: town, zone of influence, spatial mobility, Toruń

INTRODUCTION

The studies of towns' influence have been conducted for many years and resulted in considerable scientific output in the Polish geographical literature. However, the works vary significantly owing to the magnitude of socio-economic phenomena modelling the relations between the town and its surroundings. Most frequently, the zone of the town's burden was delimited on the grounds of the investigations of permanent migrations (e.g. Szymańska, 2000; Matczak, 2000; Michalski, 1991), commuting (e.g. Namysłowski, 1980; Zborowski, 2002), commuting to secondary schools (e.g. Namysłowski, 1977), cargo transport (e.g. Matczak, 1984; Matczak and Michalski, 1982) or economic base (e.g. Kozłow-

ski, 1977; Matczak and Szymańska, 2000). These studies resulted in determining the impact extent of the selected town functions. Yet, among those numerous works there are only few that study the town's influence in a complex way, taking into consideration several different functional and spatial relations (e.g. Matczak and Szymańska, 1997). The results of these works indicate how big differences in the extent are depending on a studied function, and how hard it is to determine the size of the zone of influence and the character of the town's external relations. Therefore, this study is an attempt to delimitate the influence zones of Toruń on the grounds of the multiaspect analyses of the phenomena of the town's influences.

The complexity of the town-surroundings relations remains a considerably important problem. They involve various quantitative and qualitative socio-economic phenomena, frequently difficult to be measured and completely incomparable. The phenomena that base on population flow and refer to a gmina unit were purposefully selected for the analyses. Not only was it possible to compare the extent but also estimate the intensity and concentration of the studied phenomena.

DELIMITATION OF TORUŃ'S ZONES OF INFLUENCE

The presented delimitation of Toruń's influence zones was based on the results of the detailed investigations of migration burden conducted in the years 2000–2002. These involved examining permanent migrations, commuting, spatial origin of the students of secondary schools, the Nicolaus Copernicus University and the Gen. Józef Bem Higher Officers' School, and also visits to Toruń for tourist, social and living purposes. All the above features constitute a base for evaluating the town's impact in three categories: the magnitude of population flow, intensity of flow (the rate per 1,000 people) and the frequency of contacts.

All the phenomena considered for the analyses were valued with respect to population flows, marking each gmina with a corresponding number of points: from 1 – the lowest intensity of the phenomena up to 6 – the highest value. The rules of evaluation were defined and the diversity of flow size was considered. After conducting a thorough analysis of the distribution of flow sizes according to the gminas, three different scales were prepared, according to which the studied phenomena were assessed.

The second component of the final point evaluation was based on the assessment of the value rate per 1,000 people of each phenomenon subject to the analysis. It was possible to take up the same scale for all the studied features.

Moreover, in order to define the importance of the studied phenomena in modelling Toruń's external relations, frequency of contacts and the quantity of the studied sample were considered. 6 points were granted when the entire sam-

ple was subject to the analysis (commuting to schools, universities, permanent migrations) or a considerable part of it which allows for an appropriate assumption of the extent of a particular function (commuting), and when the population flow occurs in a daily or weekly rhythm. In the case of studying an incomplete sample (visits to Toruń for tourist, social and living purposes) and occasional contacts, a respectively smaller numbers of points were granted. The number of discovered relations was taken into consideration while delimitating the zones of influence.

The proposed investigation procedure resulted in the evaluation of the socio-economic relations between Toruń and the gminas located within its impact extent, all reflected in a point value.

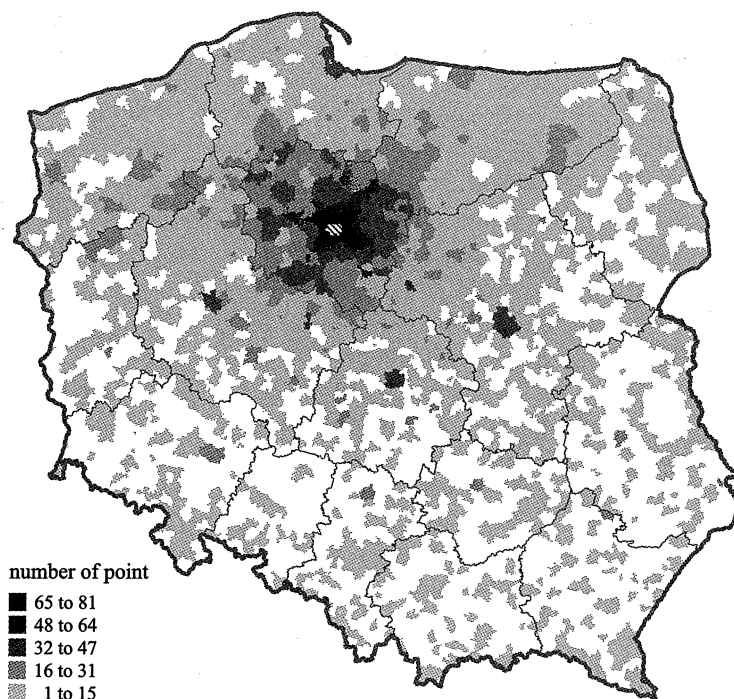


Fig. 1. The socio-economic relations between Toruń and the gminas located within its impact extent, all reflected in a point value

Source: Own research

The maximum extent of Toruń's socio-economic influence, defined on the grounds of the data concerning population flow, covers the area of 1,361 gminas occupying 60% of the country's land, inhabited by 77% of the total population. We cannot, however, unambiguously identify this zone with the zone of the functional dominance of Toruń. In the case of discovering single relations and

low intensity of the phenomenon (i.e. the flow of individual persons) it is difficult to prove the existence of developed and permanent socio-economic relations, and hence, delimitate and characterise the zones of the town's influence.

Owing to the point valorisation, the obtained representation of functional dependencies between Toruń and widely understood surroundings allows for a clear-cut and relatively easy delimitation of the first zone only. It is complicated to determine other undisputable clear limits due to the lack of spatial continuity of the areas which are characterised by an applicable (indicated in the sections of the adopted scale) mobility intensity. Therefore, the delimitation of the successive zones (II and III) was based upon a more detailed analysis of the studied phenomena (concentration, among others).

Taking into consideration the number of the stated interactions and characteristics of the related population flows (magnitude, intensity and concentration), three zones were determined within the obtained impact extent.

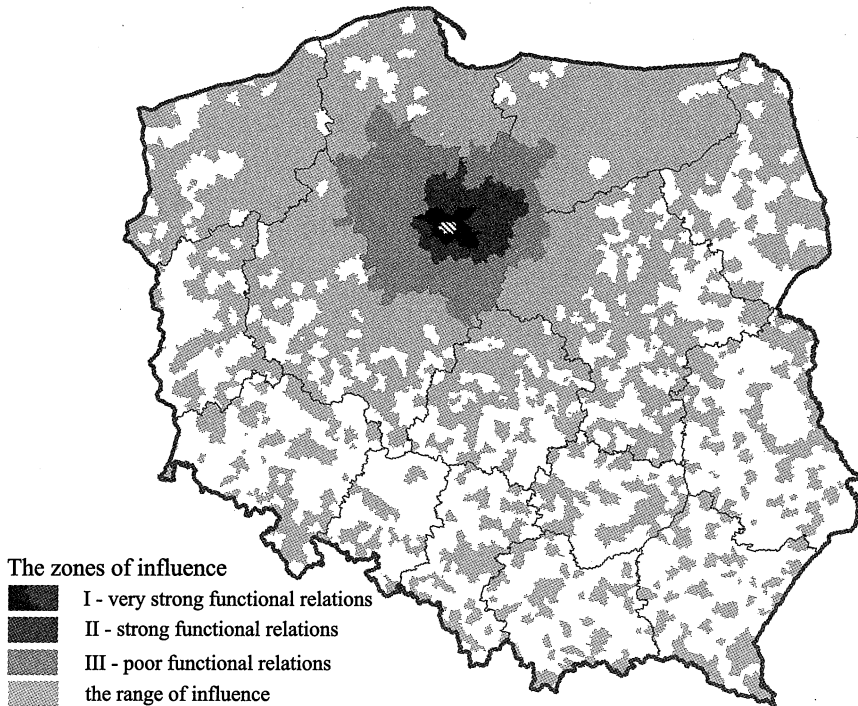


Fig. 2. Delimitation of the zones of Toruń's influence
Source: Own research

The first zone comprises 10 suburban gminas which scored in the range from 65 to 81 points. They were found to have relations in all the analysed categories and big intensity of population flow measured in both absolute values

and the rate per 1,000 people. Due to spatial accessibility (small distance) within the zone limits, considerable majority of mobility occurs in the daily rhythm. The flow concentration is also high. It is modelled by commuting, educational functions and permanent migrations. Accounting for the above characteristics this zone may be identified with the area of Toruń's functional dominance.

The conducted analysis indicated other strong dependencies among the towns in the region. As far as bigger towns are concerned, the rate value per 1,000 people proves low and there is a bigger importance of higher education and tourist functions determining, hence, the degree of valorisation.

The second zone comprises 62 gminas whose relations with the town were rated at 32–64 points. The majority of them lie within limits of the Kujawsko-Pomorskie Voivodeship, thus, confirming big significance of Toruń in the regional scale. This zone is characterised by an asymmetrical layout of a relatively small extent towards the south and west. Considerably complex layout in the north-east and east parts of the region clearly refers to the limits of the former Toruńskie Voivodeship and Toruń's network of communication lines. All those 6 gminas were found to have relations in 5 or 6 analysed categories. With respect to the first zone, the number of the obtained points indicates a bigger diversity in the intensity of population flow with the dominance of average or low (4–2 points). Within the zone limits Toruń's standard function close down, e.g. the termination of permanent mobility.

It is worth underlining that bigger cities like: Warszawa, Łódź, Poznań and Gdańsk–Gdynia–Sopot received a similar point score, which proves increasing complexity of mutual relations among main elements of the country's settlement network.

The third distinct zone covers a concise area of 134 gminas whose connections with Toruń were rated at 16–31 points. In the south and west the area fits in perfectly with the region limits of the Kujawsko-Pomorskie, whereas it exceeds them in the north and north-east directions. The expansion of this zone in the north-east directions, which comprises several gminas of the Warmińsko-Mazurskie Voivodeship, results from the limits of the former Toruń Voivodeship which had functioned in this area until 1998. The results of the conducted analyses prove the importance of administrative limits in the process of modelling the town-surroundings relations.

The distinguished zone is characterised by 2 or 4 relations, and their determining population flows are connected to educational functions, migrations and tourism. The relations resulting from the activity of higher education schools and tourism got definitely higher scores, for both the magnitude of flows and the rates per 1,000 people. This indicated penetration of the functions in space and changes in their importance in a different scale.

The area of the remaining 1,155 gminas located within the range of Toruń's impact obtained 6–15 points. This low score results from the low intensity of

population flow. In the above-regional scale and the relations are mainly modelled by higher education and migrations. On the other hand, the importance of tourism declines. It remains significant for bigger cities.

CONCLUSION

On the grounds of the analyses of the magnitude, intensity and frequency of population flows and the size of the examined sample (assuming it is essential to the assessment of the actual extent), it was possible to distinguish three zones of Toruń's influence.

The first area comprises 8 suburban gminas. It is characterised by the relations found in all the analysed ranges and high intensity of population flows in a daily rhythm. This zone reveals very strong functional relations with Toruń and covers the extent of the function of a local importance.

The second zone covers the area of 62 gminas of the Kujawsko-Pomorskie Voivodeship. A considerable part of the exchange of population migration occurs within this zone. Numerous functional and spatial relations were identified (from 4 to 6). The related population flows lead to the assumption of a permanent character of the studied relations. This zone matches the system of the settlement and communication networks in the region, and clearly corresponds to the course of the former Toruńskie Voivodeship, proving, thus, the importance of the above factors in modelling the impact extent of the standard functions.

The third zone slightly exceeds the limits of the Kujawsko-Pomorskie Voivodeship and comprises 134 gminas. It reveals relations in 2 to 4 ranges and shows low intensity of population flows. The studies prove that in the spatial scale Toruń's functional relations primarily involve educational (higher education and highly specialised secondary education) and tourist functions, as well as permanent migrations.

The area of 1,155 gminas remaining in the range of Toruń's influence is characterised by the low intensity of population flow linked to exogenic specialised functions and permanent migrations. The majority of this area (716 gminas) showed the relations in the range of merely one of the analysed phenomena, which does not create a sufficient base for assessing the permanent character of these relations.

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