

SETTLEMENT EXPANDING AND ENVIRONMENT SURVEY BY GEOINFORMATICAL METHODS

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Abstract: This paper tries to explore the settlement development effects of certain natural conditions on Pécs city's development, which is lying in SW-Hungary. We've made digital relief model from the local 1:25.000 scale topographic map by means of digital contour lines. We've added the slope angle-, aspect angle- and water distance layers to establish the relative weighted environmental quality map of Pécs with a settlement expanding expect, lying on natural conditions. Owing to the surveyed natural conditions the model can prognosticate, that the expanding of the city will be quicker in certain directions and slower in other ones. We have established five sectors marking the settlement-expanding in the near future. It can be said as a conclusion, that the areas marked by the model are really the most suitable terrains for constructions in Pécs city. However in certain places smaller or bigger deviations can be perceived between the expanding model and reality.

Key words: settlement expanding, natural conditions, environmental quality map

Introduction

Position of settlements, their life, development, growth, stagnancy or their ceasing depend considerably on natural conditions even nowadays. For average viewers the concrete features of natural environment, such as relief, hydrography or climate, which influence obviously the agriculture, construction, are more suggestive, than the so called 'geographical energies', which can flourish or cease settlements (Lovász, 1982; Tóth, 1981).

Relation between settlement expanding and environment in Pécs

This paper tries to explore the settlement development effects of certain natural conditions on Pécs city's development, which is lying in SW-Hungary. The area of Pécs city has diversified morphological and hydrographical conditions owing to its situation, partly on the E-W dissected southern slopes of Mecsek Mountains and partly on the swampy foreland of the Pécs basin lying in the foreground of the mountain Settlements in their ground plan development grow towards different aspect and steepness of surfaces. According empirical surveys it can be laid down, that plains or flat lands and gentle slopes with southern aspects represent the most favourable conditions. The development of settlements are prevented by swampy lands. These kind of natural conditions can be defined numerically by the help of geoinformetrical programs.

For the above mentioned survey we've made digital relief model from the local 1:25.000 scale topographic map by means of digital contour lines (Dobos, 2001). From this model we've calculated aspect angle- and slope angle maps. On these created layers we have tried to rate the worse and better conditions on a range from 1 to 5. In addition from the basic map we have digitalized the perennial streams and standing waters, from which

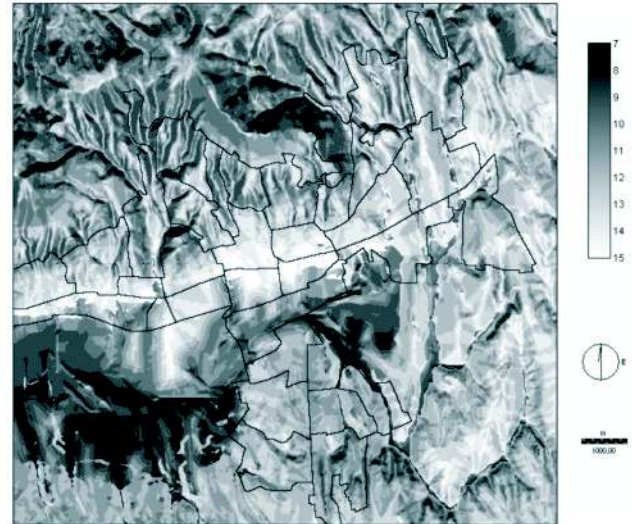


Fig. 1: The relative weighted environmental quality map of Pécs with a settlement expanding expect, lying on natural conditions (In legend the score appears)

we measured distance categories and rated the increasing distance on a higher and higher scale (from 1-5). We've added the slope angle-, aspect angle- and water distance layers to establish the relative weighted environmental quality map of Pécs with a settlement expanding expect, lying on natural conditions. Thus on these established result layers the picture factors can get maximum 15 points (fig. 1.).

Surveying the environmental quality map it can be laid down, that our fathers had not settled on chance in this region. Concerning the environmental quality map of Pécs, the centre of the town and the areas in its environs represent the most widespread sites among places, which get the highest scores. In later times the direction of settlement-expanding is explainable well by the areas located in the E and W direction from the centre of the city, on foothill region, characterized by high scores, which form more or less a continuous stripe on the map. We had made a settlement-spreading survey by means of the IDRISI geoinformetrical program.

First of all we had been interested in development tendencies of the near future while we were making the settlement-expanding model map, lying on natural conditions. Thus for the starting point we prepared the digitalized built-up area of Pécs from the last military surveying map from 1988. This made possible for us to assess the functioning capacity of the model in the base of the last 20 years development tendencies. Owing to the surveyed natural conditions the model can prognosticate, that the expanding of the city will be quicker in certain directions and slower in other ones. We have established five sectors marking the settlement-expanding in the near future.

From the reasoning map, from the density of isolines it can be read, that the quickness of expanding above average mostly in the E and SE direction are supported by natural conditions (fig. 2.) This conclusion is underlined by the constructions of the last 20 years, after the last military mapping. In the above mentioned sites the setting up of the family homes increased continuously and in

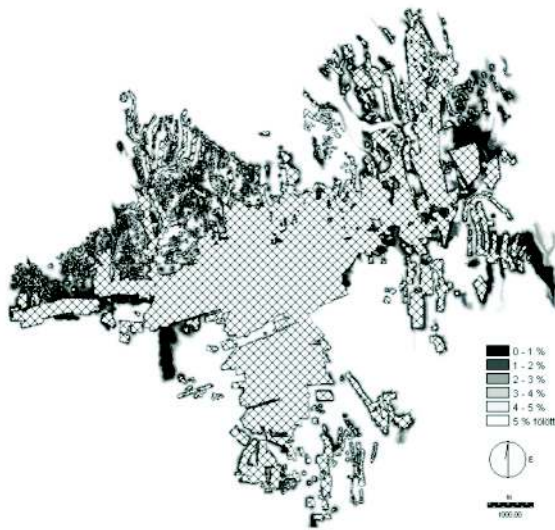


Fig. 1: The ground-plan centered settlement-expanding model of Pécs from 1988, lying on natural conditions (in legend „a relative expanding charge score” colour keys are visible, the grated area is the ground plan of Pécs from 1988)

the established industrial parks a lot of new plants were built. In the NE part of the city it is noticeable the density of family homes and the recently built, large-sized residential parks. This process can strengthen, if the marks of the earlier minings will be recultivated and there new park, lake, entertaining and educational centres will be established.

According to the model map in the NW areas, on the hillside, formerly full of vineyards, the building-up will be considerably higher in extent. By the survey the above mentioned constructions have been realized. In the W direction a quicker development is observable: a long row of newly built terraced houses and shopping centers (hipermarkets) have been established. The 6th main road, crossing Pécs city in E- W direction, conforms to the best natural conditions. It's closeness to the foot of the Mecsek Mountain attracts the great investments

In the last two decades numerous commercial investments were taken place in Pécs (hipermarkets, shopping centers, technical stores), which had changed the aspect of the town fundamentally (Aubert and Trócsányi, 2001; Berki and Csapó, 2006; Ronczyk and Trócsányi, 2006). In place selection the areas with favourable natural conditions were taken at advantage: mainly the margine of the basin, nearly flat grounds, where the building of the institutions can be realised from lower charges. In contrast with family houses or terraced houses, which are built on smaller basic areas and from lower costs, these big investments accomodate to the best conceivable features of the terrain. For understandable reasons these investments were established in E-W direction, in the margine of the Pécs basin or in the higher parts of the basin floor.

According to the model map the expanding of the town is also significant on the higher sites of the S margine of the Pécs-basin, where the erection of family houses, residential parks, terraced houses and tenement block of flats can be observable.

Conclusions

It can be said as a conclusion, that the areas marked by the model are really the most suitable terrains for constructions in

Pécs city. However in certain places smaller or bigger deviations can be perceived between the expanding model and reality. First of all this is owing to the fact, that we didn't implied the social factors in our survey. According to our experience these factors increase only the building of family homes on the hillside.

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