

THE MORPHOLOGY OF TÂRNAVA MARE CORRIDOR AND IT'S CONDITIONING ON THE SETTLEMENTS AND THOROUGHFARES PLANNING (COPȘA MICĂ – BLAJ SECTOR)

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ABSTRACT. – *Târnava Mare Corridor Morphology Conditionings in the Settlements and Thoroughfares Planning (Copșa Mică – Blaj Sector). Settlements and thoroughfares positioning in hilly terrains, fragmented by valleys, as in the Târnava Mare Corridor case, is influenced by the value of morphological parameters. The variety of the relief, as extension and altitude, determines a specific distribution of the resources offered by the other geographic components. This directs to the anthropic component adaptation to local conditions, action expressed by capitalizing the favorable areas and avoiding the restrictive ones.*

Keywords: relief, settlements, thoroughfares

1. General Considerations

The presence and specific position of main rivers valley corridors (Someșul Mare, Someșul Mic, Someș, Mureș, Târnava Mare, Târnava Mică, Târnava, Secaș, Apold, Hârtibaciu and Olt) in The Transylvanian Depression decisively influenced the position and distribution of settlements and thoroughfares. The existing differences among those valley corridors urge to separate analysis. Consequence, in the paper it will be approached the Târnava Mare corridor, between Copșa Mică and Blaj. It stretches between Târnavai Mici Hills (N. Josan, 1979) and Secașului Plateau.

Considering its position, the 30 kilometers long corridor represents a real axis which directed the settlements and thoroughfares position. In their turn, those last ones were influenced by the morphological and morphometrical relief characteristics.

2. The Relief of Târnava Mare Corridor (Copșa Mică – Blaj Sector)

The relief particularities of an area may be differently contoured, depending on the intended purpose. In the paper, it will be presented the landforms which, by their presence and extension, offered favorable living conditions or contrarily, represented a restrictive factor.

In the mentioned sector, the Târnava Mare valley conserves, for the most, the morphological characteristics generalized for its full length in the Transylvanian Depression (between Odorheiu Secuiesc and Blaj). Among them, stands the obvious asymmetry, given by a front cuesta on the right and a reverse with well conserved terraces (for example, Țapu), on the left. Thereby, the corridor receives the characteristics of an asymmetrical depression, well developed, with a plane and uniform bottom (N. Josan, 1979). Though, making an analysis on the meadow level, one can find differentiations in its width and distinguish narrow sectors like those downstream Copșa Mică and Mănărade (less than 600 m width). The narrows are caused by the river's flowing through a poorly consolidated sand complex alternating with thin calcareous marls layers and, locally, sandstones, filling the synclinal areas between the domes (N. Josan, 1979).

In the Transylvanian Depression, *the meadow* is 600 to 1250 m wide. At flow over 500 m³/s, as in 1970, 1975, 1998, the meadow is flooded; for instance, in 1975, at Blaj hydrometric station were recorded 800 m³/s (V. Sorocovschi, 1996). Thereto, in the analyzed sector, add a 1.51 meandering coefficient. The floodplain and the concave river banks, with the erosion as specific process, represent restrictive factors in setting any settlements or thoroughfares.

Among the favorable relief of the corridor, one can see *the terraces*. They are morphologically well defined landforms, with high importance for the human activities in the corridor, advantages given by their position, hydrologic resources and morphology. As anthropic capitalization, the Târnava Mare River terraces advantaged the emergence

and extension of human habitat (Copșa Mică, Țapu, Micăsasa, Valea Lungă, Mănărade and Blaj) and thoroughfares (National Road number 14, Main Railroad number 300), being suitable for agriculture too.

The Târnava Mare River terraces present a slight tilt, both towards the valley axis and its flow direction. Generally, they are parallel to the river and developed more as length; some portions of the second terrace are exceptions and present a higher extension in width (Dorina Bălănescu, 1992). Their dimension is ranging from 100 m to 2 or 3 km in length, and from 20 m to 700 m in width.

Among the elements, the top of the terraces are well preserved, without bumps, colluvium or proluvium accumulations as well as compacting processes. The scarp of terraces are pronounced, evidencing the volt from one rhythm to another in the circle of the valley and the amplitude of the movement separating two phases of the fluvial evolution. There are excepted the areas where they were destroyed by the geomorphologic processes or they were flattened by human action during the alluvial exploiting. The openings in the scarp of terraces allowed us to observe their alluvial structure, made of different sand categories, clays and narrow strips of gravel which, rarely, also appear in the deposits. The alternation and the height of these layers are also indicating the duration of the processes in Târnava Mare basin.

In order to confirm those above mentioned, we shall locate the main sections where the Târnava Mare terraces preserved; the approach will localize every terrace step.

- The meadow terrace (t_1) accompanies the river on its whole length, with different development degree and obvious asymmetry;

- The second terrace (t_2), at 8 – 12m relative altitude, starts at Copșa Mică, where it hosts the industry units, the railway station and a part of the town (Dorina Bălănescu, 1992). Downstream the Visa river confluence, the second terrace has many interruptions but it is well preserved at Micăsasa.

- The third terrace (t_3), positioned at 15 – 20m relative altitude, appears as different sized fragments, especially on the left side of the valley, like at Țapu (fig. 1);

- The fourth terrace (t_4), with 30 – 35m relative altitude, shows up downstream the Visa confluence, than East of Țapu, facing the Lunca Village, and close upstream the Târnava Mică confluence it is well developed at Ciufud and Veza (component of Blaj Municipality);

- The fifth terrace (t_5), at 55m relative altitude, is well preserved at Zăvoiu de Sus and East of Țapu (Dorina Bălănescu, 1992);
- The sixth terrace (t_6), is situated at 70 – 80m relative altitude; downstream Copșa Mică it is found in the little top terraces above Bercului and at Răzoare areas above Veza settlement;

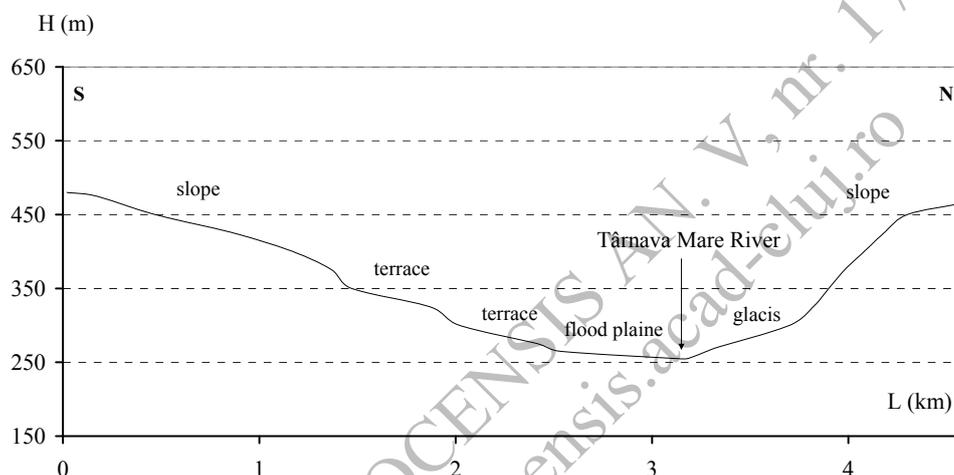


Fig. 1. Transversal geomorphologic profile on Târnava Mare valley, at Țapu

- The seventh terrace (t_7) has a 95 – 110m relative altitude and it is present beside Mănărade village.

In conclusion, in this sector of Târnava Mare valley, the terraces we have described fit, with some small exceptions, in the system generally established for the Transylvanian Depression: 2 – 4m (the meadow), 6 – 10 m (t_2); 15 – 25 m (t_3); 30 - 40 m (t_4); 50 – 55 m (t_5); 70 – 75 m (t_6); 90 – 110 m (t_7) (T. Morariu, I. Donisă, 1968).

The corridor *hillsides* present differentiations due to their asymmetry. On the right they overlap the cuesta fronts, they are mostly oriented towards South and they are affected by linear erosion, landslides and derasion (O. L. Muntean, 2004). Their tilt values, sometimes over 20 – 25°, constrained the setting of human habitat and thoroughfares; the most of them are located on the left side of the corridor, where on the hillsides lower section prevail the terraces and glacis. The hillside contact with the meadow

is intermediate by a more or less developed glacis. Unlike these, the left side hillsides are long, with North exposure.

The interstream areas have lesser importance considering the problems we put in the paper. Though they are well conserved and relatively smoothed, the interstreams are hard to capitalize as human habitats or thoroughfares because of their high relative altitude from the bottom of the corridor (150 – 200m).

We may conclude that, by its landforms, the corridor sector we are analyzing presents advantages in anthropic capitalization (the presence of the terraces and of the left hillside with favorable relief parameters), as well as disadvantages (the frequently flooded meadow and the two narrowing sectors of the corridor). In consequence, we may outline that it is about a special evolution and morphology that reflected in the different way of intervention of the anthropic component, aspects treated in the next.

3. Conditionality required by the relief

The human intervention in territory took place according to the conditions of the relief and of the other geographic components. Along this chapter we shall bring to front the modality which in the relief directed the setting of human settlements and thoroughfares in the corridor section we have approached.

3.1. Conditionality required in settlements positioning

In the corridor section we are analyzing, excepting the towns at the ends (Copșa Mică and Blaj), there are only rural settlements. The relief, in accord with the other geographic components, directly influenced the position, the physiognomy, the structure of the street network, the economic potential etc., of each of the settlements. There are 5 rural settlements (upstream to downstream): Micăsasa, Țapu, Lunca, Valea Lungă and Mănărade (fig. 2).

Depending on the positioned landforms, it can be made a classification of the mentioned settlements, indicating that some of them developed on several types of landforms:

- Settlements developed in the meadow: the southern half of Micăsasa, the northern part of Lunca and the most of Mănărade village;
- Settlements developed on the terraces: Țapu, Micăsasa and, partially, Lunca;
- Settlements placed on dejection cones: Valea Lungă;

- Settlements placed on the glacia: the northern extremity of Micăsasa village and the southern one of Mănărade.

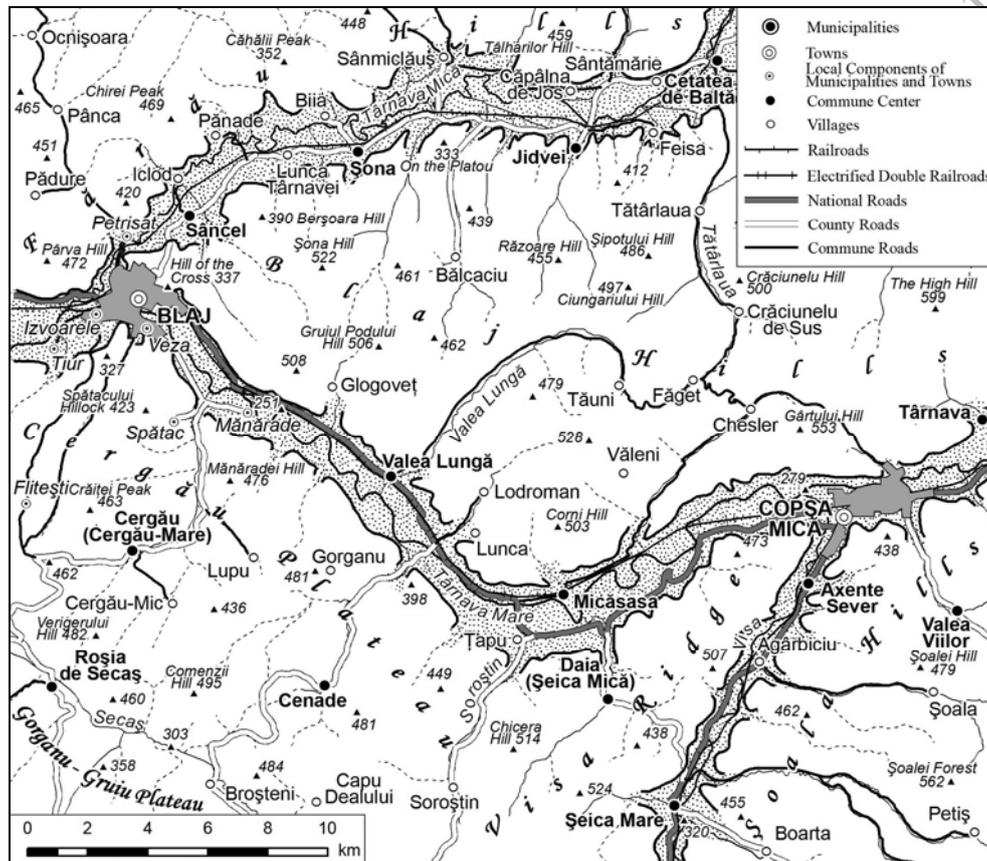


Fig. 2. The Târnava Mare River Corridor (Copșa Mică – Blaj Section)

Considering the classification, one can find that most of the settlements overlap favorable landforms as flatness (meadow, terraces, cones or glacia). The problem is about the flooding which affects the meadow and, in default, the settlements here.

3.2. Conditionality in thoroughfares planning

Among thoroughfares, in the next it will be brought into attention the situation of the road and railroad networks.

3.2.1. The road network

The road planning in the valleys corridors was favored or contrarily by the relief parameters (declivity, drainage depth and density).

The road network in Târnava Mare River corridor is made of main and secondary roads. The main road is the National Road 14B (DN 14B), East – West oriented, which crosses the most of the settlements. There are also a series of secondary roads (county roads and communal roads), disposed perpendicularly to the main road, connecting the corridor to the settlements in North and South (fig. 2).

In order to present the relief conditionality, we shall present the situation of DN 14B, Copșa Mică – Blaj section.

Between Copșa Mică and the intersection with the county road towards Șeica Mică, DN 14B follows the Târnava Mare River meadow and the glacis connecting it to the left hillside for the first 4 km, and then, for the next 3 km, to stretch on the scarp of terraces and the top of the third terrace. In vicinity of Șeica Mică – Târnava Mare confluence, the main road lies again in the meadow and the second terrace, for than, down to Țapu, to ascend once more on the scarp of terraces and top of the third terrace. Between Țapu and Micăsasa the road is entirely positioned in the meadow. Here the road passes from the left to the right side of the corridor; consequence, a 150 m long bridge was built over Târnava Mare River. Next, on the right side of the corridor the road follows the basis of the cuesta front, to the proximity of Lunca village where it descends again in the Târnava Mare River flooded meadow, which it accompanies to Valea Lungă village. Further, to Blaj town, the road is located on the glacis at the basis of cuesta front. After Blaj town, DN 14B follows the Târnava Mare River corridor to Mureș River corridor where it connects to European Road 81 (E 81, Halmeu – Satu Mare - Zalău – Cluj-Napoca – Turda – Alba Iulia – Sibiu – Râmnicu Vâlcea – Ploiești – București). All between Copșa Mică and Blaj DN 14B is made of light asphalt coverage.

One may see that the road network is positioned especially on the corridor lower steps (meadow, terraces and glacis). This is mostly because of the relief morphology and morphometry, adding the presence of Târnava Mare River which floods the meadow on the sectors without dams.

3.2.2. The corridor's railroad

The Târnava Mare River Corridor is crossed by the 654 km long Main Railroad 300 (București – Brașov – Copșa Mică – Blaj – Teiuș – Cluj-

Napoca - Oradea – Episcopia Bihor), of which, 30 km in the analyzed corridor.

The railroad is normal gauge (1435 mm) double and electrified. In the segment between Copșa Mică and Blaj are 10 railroad stations, resulting a 3 km medium distance between them. The whole distance is covered in 45 minutes by a slow train and in 29 minutes by a faster one.

The relief determined some constrains in building the railroad too (fig. 2). Thus, leaving Copșa Mică town, the railroad enters the meadow at Târnava Mare – Visa confluence. After passing Visa River on an iron bridge, it still follows the meadow, on the left of the river, towards Șeica Mică railroad station. Then, after traversing Târnava Mare River, it positions on the corridor's left side, on the contact between the cuesta front and the meadow; in this way, its embankment remains outside the flooded area during the high waters. The situation maintains until Lunca, where, for 3 km it is once again located in the meadow. Moore on, from Valea Lungă to Blaj, it is positioned at the lower part of the glacis at the basis of the cuesta front, which accompanies the corridor on the right.

In this sector, the main constrains are about the nearing of Târnava Mare valley to the corridor's right hillside, such as upstream and downstream Micăsasa, as well as at Mănărade. In order to perform railroad transport at the necessary capacity and parameters, there were necessary works of consolidation of the embankment and hillsides as the meander curls were undermining their basis. Such important works were made in the 9th decade of the last century. Also, there were made rising works in the areas where the embankment was flooded during the high waters.

After building the double electrified railroad it appeared the anthropic relief, such as the embankments and the cuts, retaining walls, bridges etc.

As elsewhere in national territory, secondary railroads detach from the main one. At Copșa Mică it branches the railroad passing through Visa River corridor to Sibiu City (line number 208, 45 km length); at Blaj the 113 km long 307 line branches to Praid, following the Târnava Mică River corridor.

4. Conclusions

One can see in the paper that considering the relief characteristics, the anthropic component acted in an own way, especially in order to

locate the settlements built areas and to trace the thoroughfares. In patches, these interventions were constrained by the short narrowing sectors and by the frequent meadow flooding. For example, considering the settlements, in the narrowing sectors between Copșa Mică and Micăsasa, for 10 km (on third of the approached sector), there is no settlement. In turn, the thoroughfares (National Road 14B and the Main Railroad 300) must avoid the meadow because of its particularities (flooding, compaction, excess moisture), following more the terraces and the glacis underneath the cuesta front.

Under these conditions, by its characteristics, the relief appears as a main factor which, by the favorable or detrimental situation it introduces, must be considered, especially when locating settlements or thoroughfares.

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