

**ELEMENTS AND OUTILS FOR GENERATING  
CROSSBORDER SYSTEMIC FUNCTIONALITY AT  
ROMANIAN/UKRAINIAN BOREDR (NORTHERN  
SECTOR)**

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**Abstract.** On 440.1 km the EU border section stretches which coincides with the Romanian-Ukrainian one (northern section), the territorial backdrop is characterized in the terms of morphology by a great landscape and altitude variety (from 200 to 1,900 m). Using the tools and methods certified in the specialized literature, we set forth a typology of the border areas, namely indicators related to the management, position, border accessibility, an important step in the elaboration of a cross-border cooperation or interregional strategies. Knowledge of the territorial administrative units under their position, the morphometric, morphographic and morphodynamic aspect represents the key of such a scientific step which will lay at the basis of the modelling of a cross-border territorial system with an enhanced functionality. Meanwhile, we obtain the border position and the border

connectivity of the contiguous territorial administrative units as realistically as possible or found close to the border.

**Keywords:** borderland, border, territorial administrative unit, Romanian-Ukrainian border, EU external border

### **Introduction**

The complex process of the EU and NATO enlargement has triggered the reconsideration of typology of the interstate relations and mainly state border role and functions. Under these new conditions the political framework considered as support for the development of a spatial order (Forster, 2000, p. 11) has radically reviewed and diversified application of the terms and vision concerning the prospects of the cross-border cooperation. On a territorial political backdrop, marked by a rapid succession of the events, through the continuous change of the role and weigh of the borders' function and all kind of administrative limits, corroborated with the morphologic peculiarities of the natural setting - a support for a state border trajectory, the effects are major in the enhancement of the differentiation/fading process of the development lagging among the contiguous territorial systems. Under these circumstances, the border areas are a centre of search of some applicable models and strategies which transform them into the cross-border territorial systems with an enhanced functionality (Ilieş, 2003; Ilieş & Grama, 2010a) and generating development. The main objective is to create a cross-border system with a high degree of systemic connectivity and functionality from two contiguous juxtaposed border subsystems.

Natural and administrative setting of this kind of studies should always be analyzed together and not separately. To analyze the administrative setting in the absence of the natural one, namely its morphological particularities, it can trigger wrong conclusions in the terms of the real potential of interconnectivity between two contiguous territorial systems. The morphology of the relief, morphologic particularities of the riverbeds, and features' profiles in the terms of length and width (Ilieş & Grama, 2010b), landscape variety, demography, economy, politics which constitute analysis elements tailored for a geography study aiming for such an objective. In the mountain area, presence of intra-

mountainous depressions (Oaş, Maramureş) and the valley corridors trigger landscape variety value of which is enhanced by diversity and wealth of the elements being made up of.

Under the administrative aspect, along a 440.1 km winding border, the corresponding administrative territorial units between the two states as main actors<sup>1</sup> (NUTS 3-5 in Romania and the corresponding for the Ukraine) are: counties (NUTS 3)/municipalities, cities and communes (NUTS 5) in Romania and regions/districts in the Ukraine (figure 1).

### **Methodology**

In order to attain the objectives set forth in such a scientific study, an important role is played by knowledge of the territorial realities via field activity correlated with use of a diversified database, correctly interpreted, and specific to an interdisciplinary research. The elements taken into account in order to determine typology and hierachization of the border accessibility and cross-border connectivity rely on the following: absolute (geographical) and relative position (insertion of the unit within a territorial structure of a superior rank and dimension) of an administrative territorial unit and its hearth; distance of the hearth versus the border and versus the closest border crossing; morphometric features of the border; morphology of the natural setting; nature of the border line support; configuration of the communication and transportation ways' system with a potential for cross-border connection, etc. (Ilieş et al., 2011). To these elements, as far as the importance of a local player is concerned, we can add human and economic potential and a rank of the unit within the national regional and local hierarchy. A series of indicators are revealed by combination of these elements which can contribute to hierachization of the administrative territorial systems of the same level (NUTS 3-5) concerning the real cross-border position and accessibility. On the one hand these indicators can show a major importance for elaboration of the strategies concerning cross-border cooperation and definition of the main interconnection points, and on the other hand, the method can also be applied in case of cooperation strategies

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<sup>1</sup> "The local council and the county council of the administrative-territorial units adjacent to the border areas may conclude cross-border cooperation agreements with the corresponding authorities of the neighbouring countries under the terms of the law" (Paragraph 1, article 13, Law 215/2001)

between counties or communes. In case of a border with a complex role and functions, as that of the EU (the European Union) and NATO (The Northern Atlantic Treaty Organisation) external border the cross-border interconnection strategies require to set up a methodology which identifies and sets a hierarchy for local and regional actors in the terms of cross-border accessibility. Furthermore, while defining typology of the border areas, besides the administrative criteria, we have taken into account the version (experimented in the specialized literature) of their extension inland on a 25-30 km with (Lichtenberger, 2000; Bufon, 2004).

**Determined structures and determinative indicators concerning the border status and the cross-border connectivity degree**

In the structure of a territorial system, natural and man-made setting intermingle, overlap and condition themselves in defining some systems of relations which lay at the basis of its functionality (Martinez, 1994; Ianoş, 2000; Bufon, 2002; Cocean, 2005; Ilieş et al., 2009; Ilieş et al., 2011; Johnson et al., 2011; Ilieş et al., 2012, etc.). Territorial administrative organisation and the human resource, both as quantity and quality, conjugated to a system of efficient communication and transportation ways are the basic pillars in outlining some systems functionality of which derives directly from an efficient applied geographical management (Ilieş et al., 2009, p. 168), and purpose of which is identified with the idea that *“a territorial system is essential in defining a certain type of territorial development which aims to pursue some socio-economic and cultural finalities”* (Cunha, 1988, p. 181-198; Ianos, 2000, p. 21). Typology of cross-border systems, correlated to the status of state-border in relation to the EU’s external border, also plays an important role in defining the functionality of determined cross-border functionality (Ilieş et al., 2010a; 2012).

In order to identify the degree of functionality of a territorial border system, the first step is to “decode its internal structure by the identification of the main components and their role in defining its status” (Ianoş, 2000, p. 21), all these contributing to delimitation of the polarizing area and its boundaries. The border system can be delimited inland on

more criteria among which we mention the following ones: extension of the border counties; the stretch made up by the parallel border line at a 25-30 km distance from it (Lichtenberger, 2000; Bufon, 2004; Ilieș & Grama, 2010b); the contiguous rings formed from the local rank administrative territorial units (municipalities, cities and communes, corresponding to NUTS 5) (Ilieș, 2010, p. 97). The typology of border and cross-border systems (Topaloglou, 2005; Suli-Zakar, 2002) in relation to the EU external border plays an important role in defining functionality of the determined cross-border lands. As an example, we shall analyze diverse scenarios for the northern Romanian-Ukrainian border sector from this perspective.

### **Borderland determined by administrative territorial units corresponding to NUTS 3 (ATU)**

The Romanian area is constituted of 4 border counties (figure 1) with a total area of 24,261.4 sqkm and a population approximately two million inhabitants (2010) which represents 10.2 % of the surface and 10 % of the Romania's population. It is also structured at its turn (NUTS 5) at the level of 114 municipalities and cities (42.7 % out of total for Romania), 1,315 communes (48.7 % of the total) made of 5,627 villages (41.8 % of the total). As far as the human potential is concerned 39.6 % of Romania's urban and 48.96 of Romania's rural population lives in the determined borderland (Ilieș et al., 2011).

### **Border area determined by the border and its parallel line situated at 30 km distance inland**

It is an applied version in other studies at the level of Slovenia (Bufon, 2002; 2004), Austria (Liechtenberg, 2000), Romania (Ilieș & Grama, 2010b). There are states of lower dimensions as Slovenia, Switzerland, Belgium, Austria, etc. where the borderland thus determined covers between 75-100 % of their territory (Bufon, 2004). In the case when the weight of the borderland thus determined is over 50% of the state's border, (or ATU) it has status of the border-state (Bufon, 2002). In case of Romania, surface of the borderland thus determined is of 93.858 sqkm (39.0 % of Romania's surface)

comprised between the border line long of 3,248.6 km and the parallel inland line of 3,008.6 km (figure 1). In the analyzed area at a length of 440.1 km it results a borderland of 13,260 sqkm (15.0 % of the total), a value determined below one at the level of counties/regions. In the case when the parallel line at 30 km selects lower rank administrative units of the counties (NUTS 5) and includes them only partially under the competence of the border police for instance, which can have legal-driven implications in case of border offences<sup>2</sup>. As a positive aspect the borderland thus determined is uniform in terms of territorial extension, the territorial differences being given by the morphologic and socio-economic particularities.

**Border harmonization index ( $I_{bh}$ )** is calculated for each borderland of two found in the territorial structure of the cross-border system. It results from the ratio of the borderland surface determined by the ATU's extension to the borderland's surface determined by the parallel border line situated at 30 km inland. The closer to one of the values resulted for two territorial border systems the more obvious the symmetry of the resulted cross-border system is. The further from (1) the value or as the differences between the two contiguous systems grow we can define asymmetric cross-border systems (from moderate to accentuate).

In case of the analyzed area, the generated border systems cover surface of 13,260 sqkm each, generating Romanian-Ukrainian cross-borderland of 26,520 sqkm. In case of the Romanian borderland  $I_{bh}$  is of 0.54 (at the level of counties) and 0.26 (at NUTS 5 level), and in case of the Ukrainian one it is of 0.38 (per regions) and 0.87 (per rayons) which reflects the fact that the rayon-divided borderland and the national Romanian borderland are the closest to the (optimal) borderland determined by a parallel line of the border 30 km inland (figure 1).

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<sup>2</sup> In the reality, border police may act on the whole area of the border-county.

**The border area determined by the lowest rank of territorial -administrative units (local actors; NUTS 5)**

In case of Romania, municipalities, cities, and communes are included in this category. If at a county level, due to their territorial extension, the border connectivity and permeability/accessibility show indicators with small differences, in case of ATUs the differences are major. There are situations when a territorial unit, although in terms of geographical position it has a border status, it is at a great distance from the border in terms of border accessibility and connectivity. The determination of the border connectivity and accessibility degree at this level and the hierachization of the ATUs according to the resulted indicators represent the main objective of a specific planning approach and border territorial planning.





cross-border systems. In the prospect of such borderland, by the correlation of the ATUs with the road and railway network (position potential), the density of the border crossing points that we can obtain a more realistic image concerning the status of border ATU in terms of functionality and territorial economic and social cohesion perspective.

Also in case of this borderland, we can calculate the mentioned indexes for (a) and (b) border areas previously determined. In order to exemplify them, we shall analyze these indexes at level of 37 ATUs (from four border counties) from the Romanian border area corresponding to the Ukrainian one (northern sector).

**Border accessibility index ( $I_{ba}$ ).** There is a large number of ATUs situated on the border without any direct cross-border connection, either due to the relief's morphology or due to political or legal regime of the border (the EU external border, for instance). While elaborating border and cross-border planning strategies an important element which determines the functionality of a border system is represented by the border crossing points considered to be connection points of two contiguous border systems. This indicator can be calculated in two ways:

**a.)** relation between length of the segment ( $L_{l-b}$ ) which links on the shortest distance the residence locality centre (l) within the ATU (when calculated for the ATU) or from the residence locality centre (l); if it is strictly calculated for it) to the border line and the distance from the ATU's residence locality centre or any other locality and the closest border crossing point (local or international;  $L_{l-cbp}$ ).

**b.)** ratio between length of the segment ( $L_{sb}$ ) which links on a road (commune, county or national) the ATU's residence locality centre (when calculated for an ATU) or from the locality centre (if calculated strictly for it) to the border line and the distance from the ATU's residence locality centre or any other locality and the closest border crossing point ( $L_{l-cbp}$ ) in local regime on a commune, county or national road. In this case, we start from the idea that the shortest existent road (irrespective of its status and technical particularities) can be turned (by modernization) into a border accessibility route.

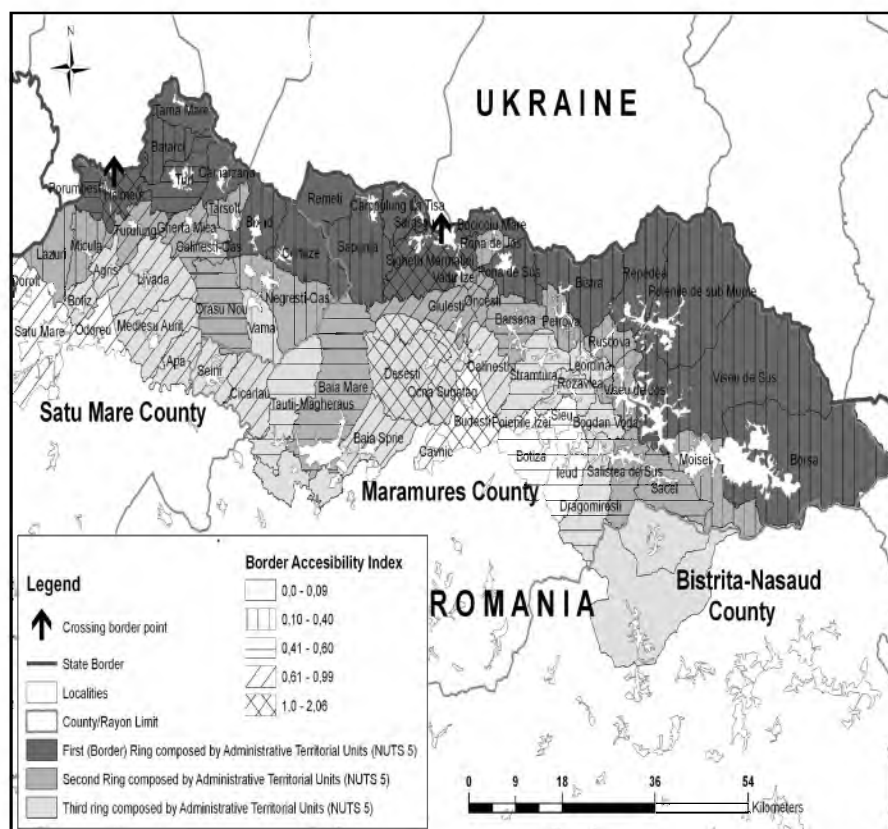
The calculation formula is  $L_{l-b}/L_{l-cbp}$ . The closer to one (1) the value of this indicator is, we can consider that ATU has the highest cross-border accessibility degree. The value of the indicator is influenced by the relief's morphology, configuration and quality of the access way network and at a lower extent by the border position. As we can also notice in the analyzed area, there are ATUs which, despite the border position, have a superior cross-border connectivity index (Baia Mare (0.54) compared to Borșa (0.23); Cămărzana (0.08) compared to Apa (0.82) a.s.o.

The interpretation of the resulted values is carried-out as follows (figure 2):

-value close to zero (0) means that the ATU or locality is found close to the border but does not benefit of a contact point (border crossing point) nearby. There is a situation which needs a careful study (calculation of the risks and costs) aiming at opening new connections in the close proximity. Examples: Bocicoiu Mare (0.04), Remeți (0.04), Tarna Mare (0.03) etc. In this situation, too, there can be orographic or hydrographic barriers which amplify the costs related to the building of such infrastructure (bridge, tunnel, viaduct, passageway etc) in the favour of a more remote version involving lower costs.

-value close to one (1) means an ideal position and accessibility, namely the border crossing point related to it assures immediate connectivity which determines for the ATU a border position with a high degree of favourability in the prospect of a cross-border connectivity.

These indicators represent useful tools in the elaboration of strategies and territorial planning designs since their values reflect territorial reality faithfully and can prevent possible errors determined by an exhaustive and superficial interpretation of a cartographic material devoid of reference materials (relief, hydrography, position of hearths versus the border line and access ways, road network configuration etc) as it happens in most cases in defining the status of border territorial administrative unit.



**Figure 2.** The Romanian borderland according with rings constituted by ATU level (NUTS 5) and *Border Accessibility Index* ( $I_{ba}$ )

### Conclusions

Analysed situation of the EU external border derives from the geographical position and dimension of the state, namely the morphologic particularities of the natural framework and the varied typology of the territorial administrative systems of Romania's contiguous states. In the view of an accurate interpretation meanwhile closer to territorial reality from the border location, within this study three delimitation criteria of some territorial border systems aim to identify the elements and mechanisms which lay at the basis of their functionality. In this sense, the introduction of

indexes of: *border harmonization*; *border accessibility* a.s.o., represent useful tools in the politics and territorial planning strategies in the interregional border and cross-border regime. Each composing part which makes up a territorial system can be analyzed, interpreted and applied at the level of existing territorial structures with the amendment that an application of the general criteria of spatial regionalization (Cocean, 2005) and identification of mechanisms which assure the determination and functionality of territorial systems (Ianoş, 2000) could group the identified structures on territorial units with a high degree of functionality triggering economic development.

Furthermore, based on the results obtained from calculation of these indicators, correlated with examples of the specialized literature we can issue opinions concerning the optimal length of a border subsystem, which is the distance from the border inland; until its effects can be sensed socially and economically on the one hand, and up to what distance from the border the involvement of decision-making actors can have direct effects on modelling the cross-border territorial systems. The values resulted in case of the proposed indexes highlight the asymmetry of the Romanian-Ukrainian cross-border system in terms of extension, internal structure and typology of the ATU rank, namely the morpho-structural differences between two contiguous border systems. All these, corroborated with the administrative decentralisation degree, role and functions of the decision-making centres (main actors) compete for the differentiated multiplication of number of the involved actors in the elaboration, application and responsibility assumption of a development strategy, namely greater difficulties in synchronizing the decision-making centres on panels and hierarchy. In case of the *border accessibility index* we can notice the influence which a border crossing point has by its existence and location in outlining and structuring the local and interregional relations.

Therefore, we may assert that the border and cross-border systems thus determined play an important role in the terms of social and economic integration, and considering elimination of traditional political border functions which trigger juxtaposed territorial structures.

**Acknowledgements.** This contribution presents results from research projects PN II 751/2007; Cultures, Module III – Partnership Romania/Slovenia 2010. The authors acknowledge to anonymous reviewer for their thoughtful suggestion and comments.

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