

borders and associated political discourses and geopolitical ambitions. Most countries of the interface have developed elaborated national environmental governance systems, yet they follow remarkably dissimilar patterns - starting from overarching values, approaches and governance styles through the most active actors and understanding of regionalism and to technical aspects. Federal structure of the Russian Federation and interaction of the two active neighborhood policies provide an increasing amount of possible institutional settings as options for region-making. The research addresses links between geopolitical conditions, types of borders and modes of regional environmental governance, including main actors and ways of defining a region.

## **NEW APPROACHES OF FINANCIAL SERVICES FOR THE INCLUSIVE AND SUSTAINABLE ENVIRONMENT**

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The concept of 'financial exclusion' developed in the last decades, so today, it means more than in the past. Leyshon and Thrift (1995) use 'financial exclusion' to indicate the limited physical access to banking services. This trend is the only one issue, the geographical form of the exclusion. Some groups of people or households are excluded from the mainstream or basic financial services due to their fiscal positions (low income, unemployed, etc.). This is the social issue of financial exclusion. In the 21st century this concept has expanded a new approach, with the digital exclusion. The original exclusion can be improved and mitigated with the opportunities provided by the internet (e-banking, phone apps, mobile payments and other FinTech methods), but this requires some basic conditions, e.g. internet network and connection possibilities, IT-knowledge, financial culture.

Some statistical data and complex indicators (branch density, operational or functional distance etc.) are appropriate for the analysing of geographical exclusion and the social and digital exclusion can be measured by some other methods from the basic statistical data analysis to the interviews and focus group meetings. These methods help for the measurement of the financial culture and knowledge of local society.

The main goals of this paper after the mapping of the problems of financial exclusion that it offers some innovative solutions for the inclusive and sustainable environment, for example:

- the development and spread of FinTech modes must be encouraged;
- increasing financial inclusion within poor neighbourhoods;
- promoting and development of sustainable and green finances.

## **SHRINKING RURAL AREAS IN HUNGARY – INQUIRING TYPES AND CAUSES**

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As a rule, rural population is shrinking in Hungary: from among the 81 rural districts (LAU-1 units) the population was growing or stagnating between the 2001-2017 period in as few as seven districts and was moderately shrinking in nine districts (an experimental typology for LAU 1 units is based on DEGURBA). Stagnating and growing has been exception from the rule in urban and suburban districts as well restricted mainly to the suburban districts of the metropolitan area of Budapest. In this context, shrinking rural districts were identified according the degree of decrease by drawing the line at -10% population loss between 2000 and 2017 (the rural average for this period was 9.2%). When socio-economic variables are looked at, two deserve special attention, ageing and labour-market

weaknesses both reflecting lacking dynamism. Spatial aspects do count as well: peripherality is certainly an important precursor to significant demographic degradation, inner and geographic peripherality alike. Relationship between shrinking and lagging is worth mentioning as well: in some most deprived rural border districts, where extreme poverty and Roma segregation prevail, shrinking does not come about understandably due to the relatively high birth rate among the Roma population.

#### **DELINEATING AND CHARACTERIZING FUNCTIONAL CROSS-BORDER REGIONS IN EUROPE**

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According to a recent European Commission communication, border regions are places where the European integration processes should be felt most positively – studying, training, working, receiving medical care and doing business across borders are activities that should be possible regardless of the existence of administrative national borders. Border regions are currently defined by the NUTS3 regions that share (or are sufficiently close to) an international land border. However, NUTS3's heterogeneous size and shape make comparisons across borders inconsistent, and may be detrimental to targeted and effective policy action and funding.

In this study, we propose a new delineation of cross-border areas in Europe based on a functional approach rather than a purely administrative one. The proposed 'functional cross-border areas' are based on driving time to land border crossings computed from a high-resolution pan-European road network. While the approach is flexible to consider different driving time thresholds, the current analysis applied 30 and 60 minutes drive-time thresholds to identify areas included in the functional border regions. In addition, we combined the resulting cross-border areas with detailed population data at municipality and grid levels to characterize them according to their demographic characteristics and trends since 1960.

The results obtained reveal that demographic growth in border areas is significantly lower than the EU average, suggesting lower overall attractiveness and economic performance. Notwithstanding, the results also show a huge diversity of accessibility and demographic trends across the EU border regions and between the two sides of each border. These findings highlight the need for renewed and more targeted policy action and investment in border areas. We argue that the proposed method to delineate and characterize cross-border regions is highly useful to support this endeavor.

#### **REGIONAL ASPECTS OF THE EFFECTS OF AIR POLLUTION ON MORTALITY IN URBAN AREAS IN POLAND**

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Air pollution is one of the key drivers of adverse health effects on a local and regional scales. Gases such as nitric oxides, sulfur oxides, carbon oxides or ozone have irritating influence on the upper respiratory tract. They damage the natural barriers against pathogens, induce chronic inflammation and may also induce neoplastic transformation in the respiratory system. Special attention has been also paid to air pollution with particulate matter PM<sub>10</sub>-PM<sub>2.5</sub> i.e. particles having the diameter between 2.5 and 10 micrometers. Particulate matter have different chemical composition and thus different biological effects in human organism. Considering human health, the most important seem to be metals (mainly in the form of oxides) and large group of polycyclic aromatic hydrocarbons (PAH) including benzo(a)pyrene which is considered as a model PAH in environmental monitoring and