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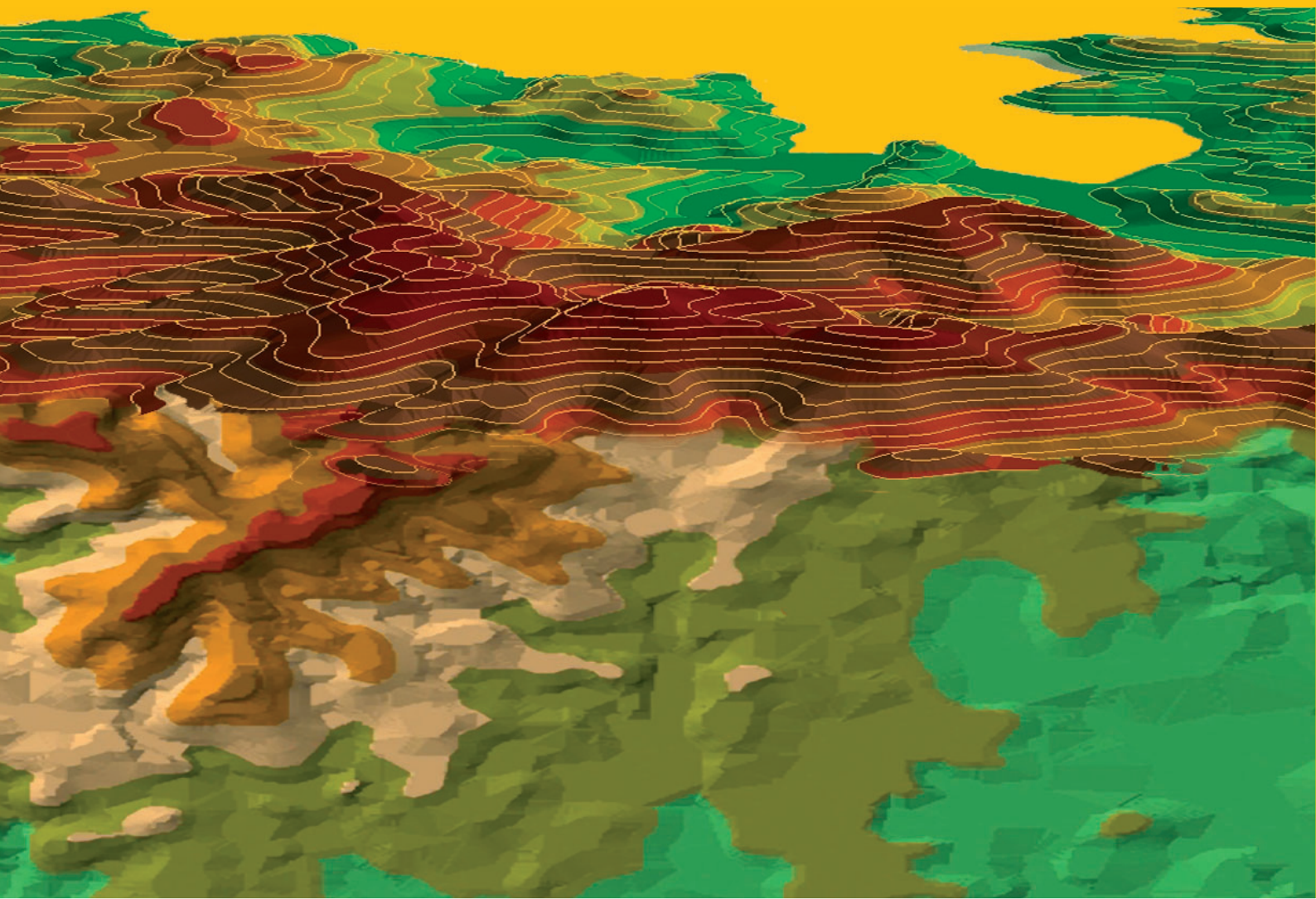

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(e-mail) mgr@geonika.cz
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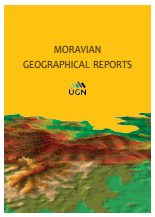

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Conflicting imaginaries in the energy transition? Nature and renewable energy in Iceland

Karl BENEDIKTSSON [a *]

Abstract

An improved understanding of the geographical unevenness of the global energy transition is important. The concept of 'sociotechnical imaginaries' has been used extensively for understanding how desired technology futures are envisioned and differentially articulated in various contexts. Supplementing this, the concept of 'nature imaginaries' is proposed in this article, to specifically address collective moral visions of human/nature relations that underwrite discourses and actions by various actors. Nature plays an active role in both types of imaginaries. Their complex interactions play a part in how energy transitions unfold. The article uses this framework for a description of the energy situation in Iceland, and its largely successful transition towards renewable energy through the development of hydropower and geothermal resources. Particular sociotechnical and nature imaginaries, sometimes opposed to each other, are discernible. The article argues that the analysis of conflicting imaginaries at work in specific energy transitions might help in identifying leverage points from where it is possible to work in a small way towards a global transition.

Keywords: *sociotechnical imaginary, nature imaginary, energy transition, renewable energy, energy landscape, Iceland*

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1. Introduction: Understanding energy transitions

In response to human-induced climate change, the world has taken a turn towards a low-carbon future. Renewable energy installations have grown considerably worldwide over the past decade (IRENA, 2020), and states have adopted a variety of policy instruments to encourage their deployment (Carley et al., 2017). It seems that the energy transition is proceeding at full speed.

Or, perhaps, not quite. Arguably there is no such thing as 'the' energy transition. Rather, various local and national transitions are underway (Sarrica et al., 2016; Labussière and Nadaï, 2018; Frantál and Nováková, 2019) – some reasonably fast, others excruciatingly slow, emphasising different technologies and institutional structures, and reflecting differing public concern and political will (Neofytou et al., 2020; Svobodova et al., 2020). Take, for instance, Germany's early and vigorous adoption of the concept of the *Energiewende* (Steinbacher, 2019) versus the stubborn adherence to coal by policy makers in neighbouring Poland (Kuchler and Bridge, 2018), and in a host of other 'recalcitrant nations' (Svobodova et al., 2020), including China and the United States – the world's principal CO_2-emitters.

Understanding this diversity of energy transitions requires not only an awareness of varied natural conditions and historical particularities, but also of ways in which the future of energy systems is collectively envisaged in different manners in various cultural contexts (Delina and Janetos, 2018). Such envisaged futures – or 'imaginaries' – generate public support for some technological or organisational innovations but can hold back the development of others. In this article, it is hypothesised that such different and sometimes incompatible cultural constructs can influence the progress towards carbon-neutral energy production. The alignment or mismatch between imaginaries that focus on different aspects might partly explain the different paths taken by energy transitions in different countries and regions.

The primary focus of this article is on the exploration of the general value of imaginaries for analysing energy transitions. The general theoretical position is elaborated at some length in the first part. The starting point will be the concept of 'social imaginaries', which has a long history in the social sciences (see Strauss, 2006, for an overview of key contributions). Building on that foundation, the idea of 'sociotechnical imaginaries' was suggested by Jasanoff and

[a] Department of Geography and Tourism, Faculty of Life and Environmental Sciences, University of Iceland, Reykjavik, Iceland (*corresponding author: K. Benediktsson, e-mail: *kben@hi.is*)

Kim (2009) for directing attention to nation-specific ways of imagining technological developments into the future. Having outlined this concept as it was originally formulated, I suggest that other – yet related – imaginaries can also play an important part, notably how ideal human relations with nonhuman nature are morally imagined, often at scales other than the national. These I will term 'nature imaginaries'. By speaking of 'nature' rather than 'environment' (cf. Peet and Watts, 1996), the intention is to allow room for non-human matter in its varied forms as active in the formation of such imaginaries. Indeed, in much recent theoretical work (see e.g. Bennett, 2004; Latour, 2005; Coole and Frost, 2010; DeLanda, 2016), agency has been conceptualised as a relational achievement between heterogenous entities of diverse kinds.

In the second part, the hypothesis of aligning or mismatching imaginaries is explored further through a description of the history and current situation of renewable energy in Iceland, a country where renewable energy is particularly abundant, and which is often noted for the high proportion of renewables in its energy mix. Prevailing sociotechnical and nature imaginaries are identified and their relations to each other are discussed. This part is based on previous research by the author (Benediktsson, 2007, 2008, 2014, 2018; Benediktsson and Waage, 2018, 2020), as well as other scholars. The database *timarit.is* was used to search for examples from printed media in Iceland, and general web searches returned further evidence from digital publications and other sources.

The article concludes with some thoughts about the implications and potential practical significance of this approach for the analysis of energy transitions in general. In short, the argument is that, if the hypothesis is true, advancing the ongoing transition to renewable energy may in some geographical contexts require a critical reconsideration of established imaginaries and even the cultivation of new ones.

2. Imaginaries and energy

2.1 Imagining the social

Attention to the imaginary dimension of society has a considerable history (see e.g. Anderson, 1983; Castoriadis, 1987; Appadurai, 1996). Very broadly speaking, two distinct emphases are discernible (Strauss, 2006). Both are concerned with analysing how the desired future is envisaged by social groups – of what the good and morally proper life should look like in years and decades to come. On the one hand, some scholars have theorised the social imaginary as "a unifying factor that provides a signified content and weaves it with the symbolic structures" (Castoriadis, 1987, p. 160): a common mindset that has been gradually articulated by a large collectivity – such as the nation – and adopted more or less in unison. Others, for example, Taylor (2004), have worked with the concept in a way that leaves more room for diversity, putting more emphasis on the imaginary as a construct of groups, small or large, rather than a broad abstraction at the national level. Taylor understands the social imaginary as "the ways in which people imagine their social existence, how they fit together with others, how things go on between them and their fellows, the expectations that are normally met, and the deeper normative notions which underlie these expectations" (Taylor, 2004, p. 23). It is deeply interwoven with practice, as it provides "that common understanding that makes possible common practices and a widely shared sense of legitimacy" (Taylor, 2004, p. 23). The scale of such collective imagining can range from small groups of people to the national or supranational level.

2.2 Imaginaries of technology and society

Technological choice and development are perforce future-oriented. Historians of technology and culture (e.g. Marx, 1964; Nye, 1990) have written insightful accounts of the uptake of particular technologies, and the role that popular and/or political visions and imaginings have played. They have warned against the idea that technology per se is the driving force of social change (Smith and Marx, 1994). For a long time, scholars of science and technology studies (STS) have also studied the role of imagination in technological and scientific development. The imaginings of scientists themselves have been extensively studied, for instance through the concept of 'technoscientific imaginaries' (Marcus, 1995). STS researchers have thus sometimes concentrated more on how technoscientific knowledge is produced by specific people at particular sites, such as in the laboratory (Latour, 1987), than on how such knowledge is imbricated with wider political processes and institutions. This runs the risk of a certain 'power blindness', which is partly what Jasanoff and Kim (2009) intended to rectify.

In their early writings on sociotechnical imaginaries, Jasanoff and Kim (2009, p. 120) define them as "collectively imagined forms of social life and social order reflected in the design and fulfilment of nation-specific scientific and/or technological projects" that "at once describe attainable futures and prescribe futures that states believe ought to be attained". As this suggests, they focus on the national level and the tasks and capacities of the state. Sociotechnical imaginaries influence the setting of policy priorities, which again reinforce or change prevailing imaginaries.

While this may run the risk of reifying the state, the concept is offered as a corrective to the tendency to ascribe imagining to selected individuals, notably in the STS context to scientists and technology experts. By contrast, what sociotechnical imaginaries highlight is the collective side of imagination. In a subsequent edited book on the concept, Jasanoff (2015, p. 4) reformulates the original definition in a little more nuanced way: "collectively held, institutionally stabilised, and publicly performed visions of desirable futures, animated by shared understandings of forms of social life and social order attainable through, and supportive of, advances in science and technology". This opens up the question for such collective imaginary work not only at the state level, but in various other social bodies as well, e.g. in advocacy groups, conservation organisations and other collectives.

Sociotechnical imaginaries are "imbued with implicit understandings of what is good or desirable in the social world writ large" (Jasanoff and Kim, 2009, pp. 122–123); hence they function as a guide into the future to attain 'the good life'. Such prescriptions are found in many places – in rather concrete forms in policy agendas and documents, as well as in media discourses; and in very basic terms both in religious beliefs and secular, usually unquestioned, cultural blueprints, such as the grand narrative of modernity and progress. Sociotechnical imaginaries encompass all these dimensions yet are somehow different: they are found "in the understudied regions between imagination and action, between discourse and decision, and between inchoate public opinion and instrumental state policy" (Jasanoff and Kim, 2009, p. 123).

The concept has been employed in a variety of case studies, involving different technological spheres and geographical contexts (see e.g. Jasanoff and Kim, 2015), proving its value for understanding not only how new ideas in science and technology are taken up and gain ground, but also how they come to be embedded in and expressed through material, institutional and cultural processes. Sometimes such ideas are extended into other fields and spaces, but they are also frequently contested and resisted. The concept has in fact been criticised for not handling diversity and contestation very successfully: "the analytic tool is calibrated to understand national policies, institutions, and elites" (Smith and Tidwell, 2016, p. 331) and "leaves under-theorized how differently positioned communities within sociotechnical systems imagine good societies" (Smith and Tidwell, 2016, p. 328). While it does not invalidate the core of the sociotechnical imaginaries concept, this is a very important critique which supports the analysis of multiple, diverse imaginaries.

2.3 Energy futures imagined

The original discussion of sociotechnical imaginaries by Jasanoff and Kim (2009) centred on nuclear energy – a hi-technology field that has developed in widely divergent ways in those countries which have embarked on it. Few topics in fact lend themselves better to the analysis of this kind than energy technologies. To take but one example, in their analysis of US energy history, Sovacool and Brossmann (2013) show how the advent of not only nuclear technology in the post-WWII era, but also the introduction of hydropower plants for electricity and the internal combustion engine for transport decades earlier, gave rise to certain socially articulated visions of the future. Now the focus has shifted decisively to renewable energy technologies. In a similar manner, the ways in which such technologies are taken up, imagined and included in a narrative of the future are at the core of the contemporary energy transition. Many researchers have already addressed this topic, analysing collectivities ranging from the multinational to the local and urban, and involving different energy sources and technologies (e.g. Eaton et al., 2014; Smith and Tidwell, 2016; Burnham et al., 2017; Cloke et al., 2017; Delina, 2018; Kuchler and Bridge, 2018; Schelhas et al., 2018; Tidwell and Tidwell, 2018; Tozer and Klenk, 2018; Longhurst and Chilvers, 2019).

The transition towards renewables involves "reconfiguring current spatial patterns of economic and social activity" (Bridge et al., 2013, p. 331). An important part of this centres on landscape and nature. Most renewable technologies impact profoundly on the landscape (Apostol et al., 2017; Roth et al., 2018). This impact varies considerably, however, in accordance with the differing energy densities and other characteristics of the source being utilised (Pasqualetti and Stremke, 2018). Despite the advice that humans should simply 'learn to love' the new 'landscapes of carbon-neutrality' (Selman, 2010), recurring disputes around various renewable energy projects show a mismatch between the ideas about technical development and human-nature relations.

The resolution of such contests is ultimately the subject of the political sphere. In their analysis of the emergent bioenergy economy in the north-eastern United States, Burnham et al. (2017) make an important point about the politics of imaginaries. In this case, two contending sociotechnical imaginaries have taken shape, one focused on regional production with corporate involvement, and the other on the community level. The authors show how the participants in the discussion about bioenergy futures "connect issues of technological choice, economic organisation, and land use decisions to their sociotechnical imaginary" (Burnham et al., 2017, p. 74) in widely different ways. At stake are basic visions of how society should be organised and how land should be used.

Recognising the politics of competing sociotechnical imaginaries is certainly a significant step towards understanding the geographical diversity of energy transitions. The strong focus on technology that is still inherent in the very concept of the sociotechnical imaginary, however, may be somewhat limiting: although technology itself can indeed be fundamentally understood as a way to deal with nature and exploit it for the benefit of humans, different ways of relating to nature do exist, which sometimes compete with the technical. Other collective imaginaries, sometimes having little to do with technology, but which focus on the environment – importantly including nonhuman nature – also manifest how ideal futures are envisaged.

2.4 Imaginaries of environment and nature

Geographers Peet and Watts (1996, p. 263) defined an 'environmental imaginary' as "a way of imagining nature, including visions of those forms of social and individual practice which are ethically proper and morally right with regard to nature." Coming to the topic from Marxist political economy and political ecology, they attempt to augment these bodies of scholarship with insights from poststructuralism, which emphasises discourse and power. Their approach stresses the social relations of production: environmental imaginaries are manifested in the "regional discursive formations" that "originate in, and display the effects of, certain physical, political-economic, and institutional settings" (Peet and Watts, 1996, p. 16).

Several researchers have picked up this concept. For instance, Nesbitt and Weiner (2001) analyse disputes in Appalachia between local landowners and environmentalists from outside the region, highlighting the conflict between very different environmental imaginaries articulated by the groups. McGregor (2004) shows how the environmental imaginaries of Australian environmentalists are constrained by the hegemony of 'sustainable development', the anthropocentrism of which, he argues, precludes the enunciation of more radical and ecocentric approaches. Other researchers have explored urban environmental imaginaries, both as a useful approach to critical urban research in general (Gabriel, 2014), and how the concept can be of value for particular cities (Millington, 2013).

To speak of 'imaginaries', of course, suggests a human-centred approach, which is further amplified by the 'environmental' qualifier. The emphasis on 'discourse' by Peet and Watts (1996), and most of those who have since used their concept for their own empirical studies, is also telling: discourse tends to be understood as human exchanges, representations, and social practices. Despite assertions to the contrary, therefore, the place of the non-human in environmental imaginary research generally seems to be more passive than active. This is somewhat problematic. While appreciating the all-too-real problems with speaking simplistically of 'nature', I would nevertheless try to work out the implications of talking about 'nature' imaginaries rather than 'environmental' ones.

I propose that nature imaginaries be defined as particular, usually unarticulated, premises held by certain groups of people about how human-nonhuman relations should be structured in order to ensure a morally sound future. Such premises exert their influence on thinking, talk and action by diverse collectivities: the state, market actors, and perhaps most notably civil society groups. They surface in the actions and events in which the groups participate, as well as in discourses and documents. They are future-oriented, yet always influenced by past events and historical memory.

Crucially, nature imaginaries are also shaped by nonhuman nature itself, its events and agencies. Far from the reified meaning that often is taken for granted when speaking of nature, I take it to be a collection of "heterogeneous, diverse, and often whimsical things that comprise the physical environments of the world" (Kaika and Swyngedouw, 2011, p. 104); things that come together and exert their agencies in particular ways in different locations. In this way, nature is an assemblage that is endowed with 'thing-power': "a force exercised by that which is not specifically human (or even organic) upon humans" (Bennett, 2004, p. 351). Work in geography and other fields has indeed extended the list of living and non-living 'things' in nature that exert such power through their relations with other things in a hybrid world (Greenhough, 2014).

While the analysis of sociotechnical imaginaries tends to highlight the state, this may not necessarily be the most relevant level for investigating nature imaginaries. They may certainly be formulated and manifested in legislation and state policy documents, e.g. in conservation policies, but then often as a reflection of sentiments and ideals that have taken their shape in other spheres than national politics, e.g. in the research of conservation science or international agreements and conventions. Market actors whose operations are based on natural resources also operate with certain nature imaginaries, but the backdrop to these is usually the pressure to maintain future profitability. If this is seriously threatened, the imaginaries may be tweaked so as to allow for new arrangements for natural resource management.

Finally, clear indications of nature imaginaries at work may also be identified in civil society. For small local groups or communities, specific nature imaginaries may take some form in confrontation with sociotechnical visions and practices promoted by state or corporate actors. Debates around particular wind energy projects, for example, often reveal concerns about nature and landscape, albeit sometimes vaguely articulated, to be the main source of community opposition. As hinted at by Hunold and Leitner (2011), for example, in their discussion of solar thermal energy in Southern California, environmental concerns can also lead to the articulation and expression of local nature imaginaries that previously had not taken on a coherent form, although their basic building blocks may have existed. This will be explored further in the second part of this article.

One may legitimately ask whether the nature imaginary, as I have defined the concept, is not simply another name for ideas, beliefs, attitudes or values pertaining to nonhuman nature. The concept certainly relates to all these terms, yet it does not equate fully to any of them. A vast and very diverse set of studies of ideas about human-nonhuman relations already exists. On the one hand, research concerning environmental attitudes, values and beliefs has a long pedigree (Ignatow, 2006), as well as how or indeed whether environmental concerns affect behaviours (Stern, 2000). Most of this work is marked by methodological individualism – the usually unstated assumption that aggregations of individual characteristics can reveal truths about larger social collectivities. Examples include Catton and Dunlap's (1980) survey-based identification of two opposing paradigms: an old but still influential 'human exemptionalist' one and a 'new ecological' one. On the other hand, there are very broad-brush characterisations of cultural realms, based to some extent on historical evidence, such as White's much-cited thesis about the influence of Judeo-Christian beliefs on how human-nature relations have been envisaged in Western cultures (White, 1967), or the idea, popular some time ago, that certain perceptions of nature existed in Asian societies where philosophies of Buddhism, Daoism or Hinduism have been prominent (Rolston III, 1987). Both can be questioned for their rather sweeping generalisations. By keeping an eye on the collective basis of nature imaginaries, albeit at different collective scales, it should be easier to avoid either methodological individualism or unwarranted generalisation when analysing environmental beliefs and attitudes.

Much of the above-mentioned work has been clearly marked by dualisms: society vs. nature; matter vs. meaning, and so on. The suggestion above, that nature be understood as an assemblage of heterogenous 'things', is an attempt to avoid this. Grasped in this way, nature does not enter into imaginary work simply as a primordial entity to be subjected to human desires and moral imperatives in a passive manner: its diverse living and non-living entities wield their 'thing-power' through the affective responses of humans to them (Thrift, 2008; Clark, 2011; Petersen, 2018). Importantly, while affects are produced by individual sensory engagements, they are also "saturated with collective knowledge and values" (Petersen, 2018, p. 7). The nature imaginary may therefore be understood as a collective, more-than-human construction – or co-construction. When it comes to renewable energy projects, the form that construction takes is by no means a foregone conclusion, but the specific outcome of the affects of nature and their cultural collective processing.

An intriguing recent example from South Korea (Kim, Chung and Seo, 2018) well illustrates the complexity and cultural depth of nature imaginaries, although the authors do not use the term themselves. In this technologically advanced country, the age-old East Asian tradition of 'pungsu' (fengshui) is still very much alive. 'Pungsu' centres on the mapping and manipulation of 'qi', the vital energy thought to affect human life in many aspects. Sites where wind conditions are favourable for the location of wind turbines are considered inauspicious in 'pungsu' terms. The erection of such turbines is resisted and likened in fact to the attempt of the Japanese occupational forces to thwart the flow of 'qi' by driving iron stakes into mountains, thus breaking the spirit of the people. One could interpret this as a very particular nature imaginary, based on ancient traditional beliefs for sure, but influenced by historically recent events, and deeply concerned about the future.

In other geographical settings, nature imaginaries will take different forms. For example, mainland European cultures generally operate with a conception of landscape that acknowledges the cultural imprint of land use on nature through history. This may have eased the recent remaking of agricultural landscapes in Northern Germany into wind energy landscapes (Krauss, 2010), and can be seen as involving a particular nature imaginary.

Such constructs can thus matter greatly when it comes to the deployment of renewable energy. Through them, human-nonhuman relations are crafted: imagining the future is

a performative act. Crucially, nonhuman agency, through various affects of the diverse things that comprise nature, is an integral participant in the act of imagining these relations. In the remainder of the article, I will explore the analytical value of this approach with a discussion of the Icelandic energy transition, and of the formation and ongoing contest of different imaginaries in this particular context.

3. Conflicting imaginings? The case of renewable energy in Iceland

3.1 The Icelandic energy mix: transition achieved?

Iceland's position regarding both energy production and use is quite different from that of its neighbours (Benediktsson and Waage, 2018). Climate, terrain and hydrological conditions create abundant possibilities from an engineering point of view for hydroelectricity and wind energy. Added to this are the geological peculiarities of the country. The geothermal gradient – the rise in temperature with subsurface depth – is high, not only in the currently active volcanic zones but also in many other areas (Arnórsson, 2017). High temperature fields are found only in the volcanically active zones that stretch from the southwest to the northeast, whereas low temperature fields are scattered over much of the country (Fig. 1).

Estimations of energy that would be technically able to be harnessed from these two major streams – hydro and geothermal – give figures in the vicinity of 60–70 TWh per annum for each (National Energy Authority and Ministries of Industry and Commerce, 2006). Notably though, these figures do not take into account the myriad constraints that exist, neither economic nor environmental. This notwithstanding, and especially when wind energy – still almost entirely untapped (Benediktsson and Waage, 2018) – is added, Iceland seems exceptionally well endowed with renewable energy sources.

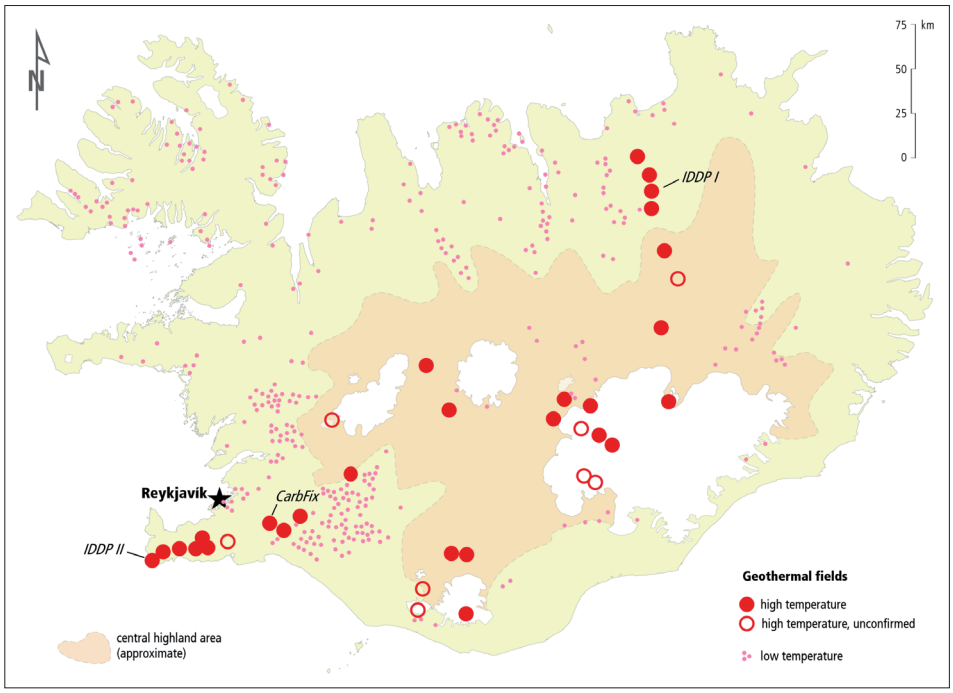

Fig. 1: Geothermal fields in Iceland. Also shown are the locations of innovation projects mentioned in the text
Source: Þorgeirsdóttir et al. (2015); map made by the author

At the beginning of the 20th century the country was overwhelmingly rural, relying on the traditional energy sources of a subsistence economy. With economic changes and urbanisation as the century progressed, the need for energy grew tremendously (see Fig. 2). At the very start of this transformation, it seemed that imported fossil fuels – coal and oil – would prevail, but electricity soon won the technological contest. Numerous mostly rather small hydropower stations were built. In the late 1960s, the first large one was constructed on one of the glacial rivers. Its construction was linked to the building of the country's first aluminium smelter (Skúlason and Hayter, 1998). Further development of large-scale hydropower has followed, culminating in the Kárahnjúkar dam and power station (690 MW), commissioned in 2007 (Karlsdóttir, 2010).

Geothermal utilisation has developed differently. In addition to traditional localised use of geothermal water for bathing, it became increasingly used for the heating of indoor spaces during the 20th century (Pálmason, 2005).

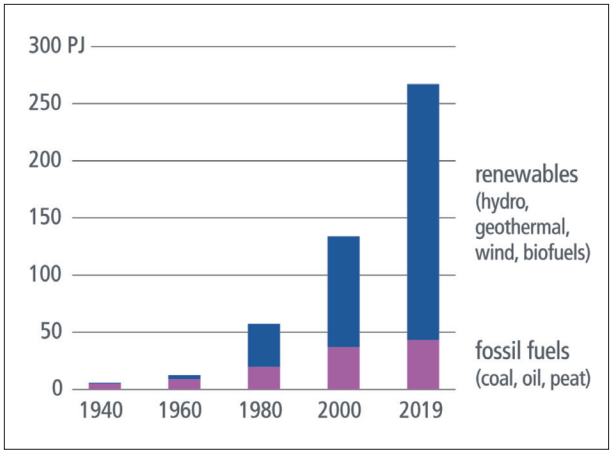

Fig. 2: Primary energy in Iceland 1940–2019
Source: Data from National Energy Authority (2020); graph made by the author

Now about 90% of homes and other buildings are heated with geothermal water, the remainder mostly using electricity from both hydropower and geothermal power stations for heating (National Energy Authority, 2019). Electricity production from geothermal sources is the most recent addition. The current energy mix indicates the vigorous development of renewables: fossil fuels now account for less than 20% of all primary energy in Iceland, whereas 80–85% comes from renewable sources (Fig. 3). Land transportation, aviation, fisheries and shipping remain dependent on oil and thus linked into the global 'carbonscape'.

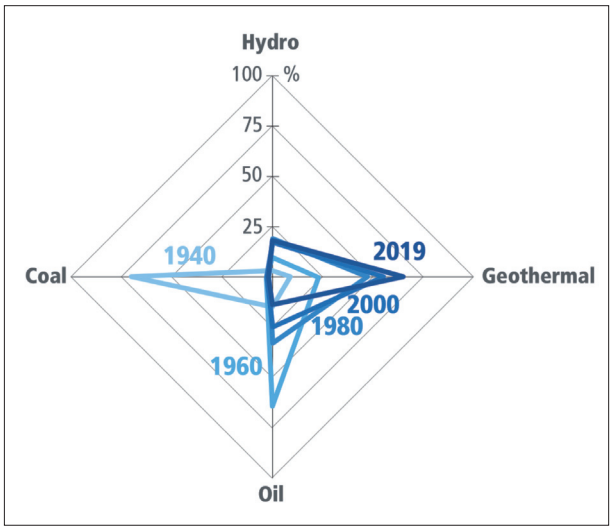

Fig. 3: The changing Icelandic primary energy mix
Source: Data from National Energy Authority (2020); graph made by the author

3.2 A geothermal sociotechnical imaginary

A new chapter in the history of geothermal energy commenced in the 1960s with the building of a small power station in northeast Iceland. Some years later, planning started for a much larger station close by. Construction began, but nature intervened: in 1975 a spate of volcanic eruptions started in the area, causing considerable delays (Ármannsson et al., 1987). Eventually the station started producing, however. Another geothermal station was successfully built in the 1970s in the southwest, without any subterranean interventions. Knowledge relating to things geothermal had started to accumulate, and Iceland's geoscientists and engineers gradually gained a reputation for expertise in this specialised field. In 1979 for example, Iceland's National Energy Authority became the host for a Geothermal Training Programme for trainees from developing countries, under the auspices of the United Nations (GRÓ-GTP, n.d.).

In the 1990s the political direction of the Icelandic government changed firmly towards neoliberalism (Benediktsson, 2014). This resulted in a far-reaching change in policies and visions pertaining to energy resources and their utilisation, not least geothermal resources. Cheap electricity became a trump card in the global game of national competitiveness. A new campaign was started for aggressively marketing the country as a location for energy-intensive industries (Guðmundsdóttir et al., 2018). In itself this was not entirely new, but the ideological change led to a much more concerted effort and contributed to the formation of a distinctive sociotechnical imaginary that centres on geothermal energy.

In 1990 the public utility company operating the district heating system of Reykjavík had gradually taken new high-temperature geothermal fields into use for the growing city, supplying both hot water and electricity from a new power station (Pálmason, 2005). This was a success. The company started planning for a much larger geothermal station some distance away, utilising the same geothermal field, albeit on the other side of the volcanic massif (Guðmundsdóttir et al., 2018). Another energy company also started constructing a new station in the southwest. Although in public ownership and originally set up to provide vital public services, both companies had adopted aggressive market-oriented strategies, eyeing good profitability with the selling of comparatively cheap geothermal electricity, marketed as 'clean and green', to bulk users.

In the first decade of the 21st century, tremendous optimism was thus in the air regarding Iceland's energy future in general, bolstered by grand proclamations of industry proponents about the country becoming a "Kuwait of the North" (Magnason, 2008, p. 198). Promoted by the power companies and supported by political heavyweights and mainstream media, it also became a part of the financial (mis)adventures that characterised Iceland at the time (Benediktsson, 2014). The tone of a newspaper editorial in 2006 provides a good example. The editor boldly states: "Nowhere has geothermal energy been harnessed to greater extent than in Iceland, and therefore no people have more ingenuity or better technology than Icelanders for exploiting it" (Anon., 2006, p. 26). In an interview a year later, the then-President of Iceland Ólafur Ragnar Grímsson no less boldly stated his opinion that Icelanders had by then "outstanding technical and commercial knowhow in this field, and there is no other nation in the world that comes close, we are the absolute leader nation" (Anon., 2007).

Impressive technological innovation, alleged financial acumen, and a perception of almost limitless potential for growth thus became components in a formative geothermal sociotechnical imaginary that often has found expression in rather nationalistic rhetoric.

This imaginary has been further strengthened with a host of innovative research-and-development projects. One is the Iceland Deep Drilling Project. A large research project, still in progress, it is a joint undertaking of public and private interests. In addition to the three largest Icelandic energy companies, large international players have joined the project, notably Statoil from Norway, the US National Science Foundation, and the aluminium giant Alcoa (IDDP, 2020). The project aims at exploring whether it is possible to access geothermal fluids under 'supercritical' conditions at much greater depth than that of ordinary geothermal wells, potentially giving access to energy at a scale previously unknown in geothermal fields. The first well, in the northeast of the country, was intended to reach a depth of 4.5 km, but drilling abruptly came to a halt at a depth of only 2.1 km when magma entered the borehole (Elders et al., 2014). The second IDDP borehole has since been drilled in the southwest (see Fig. 1), reaching the depth of 4,659 m in early 2017 (Friðleifsson et al., 2017), the temperature (427 °C) and pressure (340 bars) indicating that supercritical conditions had indeed been reached. At the time of writing, this well was undergoing flow testing.

Yet another and no less interesting strand has been added in recent years to the Icelandic geothermal imaginary. This is the so-called CarbFix project (CarbFix, 2019), a research project aimed at developing methods for sequestering

carbon by dissolving CO_2 in geothermal water and pumping it into the basaltic bedrock, where the carbon is mineralised as limestone. Geological conditions make the country particularly suitable for the process, but basalts are worldwide mainly found in volcanic areas and where the oceanic crust has formed through plate spreading. While subterranean carbon storage is not a completely new technology, the association with geothermal power production is novel. The technique has been proven to work very well (Matter et al., 2016). Numerous international media quickly picked up the story, some employing rather hyperbolic headlines proclaiming that CO_2 had been "turned into stone" and declaring this as nothing less than a "climate change breakthrough" (Carrington, 2016). The current impact is somewhat more modest, yet significant: the geothermal power station where the CarbFix project is located (see Fig. 1) is already sequestering a substantial part of the carbon that would otherwise be emitted by the plant itself. With prices of emission quotas rising rapidly on the European market (Hodgson, 2020), there are those who hope that the method will make Iceland an even more competitive location for CO_2-emitting heavy industry, providing unique opportunities for corporate actors to fix carbon in rock instead of having to buy expensive quotas. The experiment is thus intimately linked to the neoliberal financialisation of carbon that has been taking shape in recent years.

These are some of the developments that have led to the consolidation of a distinctive geothermal sociotechnical imaginary in Iceland: an imaginary that presents a future of almost unlimited geothermal energy with minimal environmental costs for the country, and even the potential for contributing with 'geoengineering' to address the most serious problem facing humankind: climate change. The imaginary is amply manifested in political, scientific and media discourses, as the glimpses provided above have shown. At its heart is an increasingly sophisticated 'techno-epistemic network' (Ballo, 2015) that embraces the narrative of ecological modernisation. New geothermal energy projects continue to be planned, the realisation of which will have corresponding imprints on the landscape. Twisting the title of Jasanoff and Kim's edited book (2015), one could perhaps talk about an emerging 'steamscape of modernity' that invokes a certain kind of aesthetic sensibility (Fig. 4).

3.3 The 'natural' landscape: an Icelandic nature imaginary

Concurrently with the formation of the geothermal sociotechnical imaginary outlined above, a different moral vision of nature has become increasingly prominent among sections of the public – a preservationist one. It is not specifically focused on the geothermal; in fact, hydropower projects have been somewhat more influential in the formation of this nature imaginary, as will be explained further below.

The nature imaginary has its roots in part in the imagining of Iceland's interior highlands as a sacred space of 'untouched wilderness' that was cemented as the 20th century progressed, but which can be traced much further back (Sæþórsdóttir, Hall and Saarinen, 2011). While the highlands had been frequently traversed during the first centuries of settlement, they took on an image of mystery and even terror and were generally an area to be avoided. This started to change with the rise of nationalism and Romanticism in the 19th century, which laid the groundwork for the prominent position that the natural landscape has since held in the island's culture. During the 20th century, new travel technologies opened up the highland landscapes to domestic recreation (Huijbens and Benediktsson, 2015). The surging international popularity of Iceland as a tourist destination in the 21st century has played right into this imaginary (Karlsdóttir, 2013). Compared with densely populated mainland Europe, Icelandic nature indeed appears rather empty, wild, and 'raw', and this has been used by tourist promoters in a skillful manner.

The first clashes between preservationists and energy proponents occurred during the first half of the 20th century (Karlsdóttir, 2010). These centred on hydropower, as ambitious plans were aired for harnessing some of Iceland's largest waterfalls. The plans were withdrawn, but hydropower development continued at more modest scales. In 1970 a major conflict between a public

Fig. 4: The geothermal picturesque? New power station at Ţeistareykir, NE-Iceland
Photo: Karl Benediktsson

hydropower company and local farmers arose in the north (Karlsdóttir, 2010), often said to mark the beginning of the environmental movement in Iceland. But it was not until the 1990s that the radically contrasting visions for the future – massive energy development on the one hand and landscape and nature preservation on the other – came head-to-head (Benediktsson, 2007, 2008). Apart from concerns about the impacts of new reservoirs and altered hydrological conditions on nonhuman life, the prospect of subjecting large swathes of hitherto 'untouched wilderness' areas to human construction was alarming to preservationists (Karlsdóttir, 2010).

This history of intense hydropower conflicts may explain why, well into this century, environmental activists seemed to think that geothermal energy was a more benign option than hydropower (cf. Guðmundsson, 2005). This is debatable. It is true that as large reservoirs do not accompany geothermal power stations, and their physical footprint on the landscape is usually smaller (Trainor et al., 2016). Yet, while localised, the direct landscape impacts of geothermal energy are considerable. These include borehole platforms, wellheads, a spaghetti of pipelines, and various other industrial-looking contraptions (Benediktsson, 2018). Added to this is the fact that the natural geothermal surface activity can be affected. Such landscape manifestations of geothermal activity are globally rare, and they are supposed to enjoy special protection in the Icelandic Nature Conservation Act (Alþingi, 2013) Concerns have been frequently aired about the expansion of the geothermal industry into new high-temperature fields. Reckless exploitation of some geothermal fields has also brought home what some geologists (Pálmason, 2005; Arnórsson, 2017) have actually argued for a long time: that geothermal energy production may in fact be more akin to the 'thermal mining' of a stock resource than tapping into a truly renewable flow resource.

Lastly, geothermal harnessing is accompanied by some emission of substances that are harmful to local environments, such as mercury and hydrogen sulphide or the global climate, notably carbon dioxide and methane (Kristmannsdóttir and Ármannsson, 2003). The release of greenhouse gases is very limited, however, compared with fossil fuel plants.

The strong association of these developments with heavy industry has increasingly led to the contestation of the very purpose of further energy development (Magnason, 2008; Guðmundsdóttir et al., 2018). Iceland currently tops the global list of nations in electricity consumption per capita, but in fact about 80% of all electricity produced in the country is used by a handful of industrial facilities (Benediktsson and Waage, 2018), three aluminium smelters being by far the largest consumers. The inherently dirty nature of these industries has been mostly glossed over in the rush to capitalise on the green image of Icelandic energy – actually the country's CO_2 emissions have increased very substantially since the development of heavy industry began (Guðmundsdóttir et al., 2018). The argument that the country would be doing the world a favour by attracting more heavy industry is summarily dismissed by those concerned with more and more local landscapes being subjected to demands of production for a voracious global market. The search for new large users has continued, but not the emphasis on other industries, such as silicon factories and especially data centres (Landsvirkjun, n.d.). The latter class of users has been growing rapidly, largely due to the mining of Bitcoin and other cryptocurrencies. Questions are being asked about the morality of allocating more and more resources to power production for this end (Eiríksdóttir, 2019).

A morally-imbued nature imaginary that centres on landscape thus seems to have taken shape. Having deep historical roots, it has been cemented through repeated confrontation with energy interests and their expressions. The idea of pristine, untouched wilderness is central to this nature imaginary (Ólafsdóttir and Sæþórsdóttir, 2020). The emphasis is on the tremendous intrinsic value of wild landscapes, which, it is argued, offer essential yet ever scarcer opportunities for humans to experience such landscapes and be affected by their nature (Fig. 5). The imagining of the country's landscapes as 'untouched' is in fact rather fanciful – they have after all been thoroughly affected by

Fig. 5: Austurengjahver, a proposed site for a geothermal power station in SW-Iceland
Photo: Karl Benediktsson

a millennium of human exploitation. Partly in recognition of this, the expression 'untouched wilderness' is now rather avoided in policy and legal documents, but it remains part of the vocabulary of many preservationists.

Another and no less important component in the formation of this nature imaginary is nationalism, which has been a prominent theme in the Icelandic environmental movement since it started to take shape (Jóhannesson, 2005; Karlsdóttir, 2010). In fact, at the turn of the century a prominent historian argued that nature had largely taken over from language as a signifier of Icelandic national identity (Hálfdanarson, 1999). Many protests against hydropower projects have involved strategies that appeal to nationalist sentiments, such as the planting of Icelandic flags into a geothermal area to be submerged under a hydropower reservoir, and the laying of stones containing words from the national anthem at another reservoir site (Brydon, 2010).

These sentiments are expressed by various groups: lay people, natural scientists, writers and artists. In fact, artists have played a large part in articulating the moral critique implicit in the nature imaginary, for example through visual artworks, installations, and land art (Brydon, 2010; Gremaud, 2014, 2017). Arguably, art has provided a way to give a particularly strong expression to the affective relations between Icelanders and non-human nature. A case in point is the work *Archive – Endangered waters* by artist Rúrí, analysed by Brydon (2010, p. 202). In this visual/aural work, first exhibited at the 2003 Venice Biennale and later in Iceland, the artist 'gave voice' to some 52 waterfalls that would be silenced – either emptied or submerged – if the numerous planned hydropower projects went ahead.

In sum, for those who have shaped and adopted the landscape-focused nature imaginary and see it as central to a morally proper future, further large-scale energy projects to produce power for the already sizeable heavy industry sector are seen as a decidedly wrong way for Icelanders to relate to the nonhuman nature with which they live. Although geothermal technology is still somewhat less contested than hydropower, the now-apparent substantial environmental impacts of geothermal electricity production have added to already existing concerns about landscape and nature.

4. Conclusion: Imagining energy futures

In this article I have argued that for understanding geographically diverse energy transition trajectories we need to contemplate how the social, the technical, and the natural fold into each other in varied ways through the imaginative futures that every society constructs, not only at the national level, but also within smaller social and geographical communities. At work are not only monolithic national sociotechnical imaginaries, but also nature imaginaries that concern the proper place of nonhuman nature for future human society.

This approach certainly has its limits. Inherent in these concepts of imaginaries is a tension between stability and change, which has not been fully resolved. Even if they are meant as help for understanding processes of temporal change and geographical diversity, they may still project rather too much stability. Imaginaries are analysed as stabilisations; sedimented world views and discourses that appear as static. While the study of nature imaginaries in addition to sociotechnical ones adds substantially to the understanding of energy transitions, both must be understood as only ever temporary solidifications of thoughts and practices that are far from immutable.

The analysis of the Icelandic imaginaries offered here is also somewhat limited, based as it is on a tentative interpretation of certain elements of national discourses, and the author's own observations through the years of Icelandic nature- and landscape-related conflicts. Yet some interesting suggestions emerge that support the hypothesis that aligning or mismatching imaginaries do influence energy transitions.

Renewable energy in Iceland is often seen as a spectacular success story, and with some justification. The country's energy landscape is the result of links between nature, scientists, technologies, corporations, and myriad other actors. But even here the energy transition is not completed, and questions remain about some aspects of its seemingly smooth progress. A distinctive sociotechnical imaginary is now in place, one which forcefully presents the continuing expansion of energy production as a moral obligation to provide the world with 'green', carbon-free energy. This is most strongly expressed in the geothermal sector, a site of intense technoscientific innovation. New experiments even present the possibility to mitigate climate change by returning carbon back to the earth. In recent years, a strong 'technological fix' approach has been evident. To be fair, some of the scientific protagonists of this exciting technology have duly acknowledged its limitations for tackling the scourge of global warming. Left mostly undiscussed, however, is the lingering concern that the enthusiasm for 'engineering Earth' (cf. Brunn, 2010), which includes even grander ideas of 'climate engineering' on a planetary scale, may not be the wisest response of mankind to this pressing problem (Hulme, 2014; Nightingale et al., 2020).

A particular nature imaginary has also emerged, that questions the very premises upon which the recent and ongoing expansion of the energy sector rests. Here the affective potential of wild landscapes assumes centre stage: the capacity of humans to be affected through encounters with nature 'in the raw'. This imaginary gains its expressive power from ideas about moral obligations to present and future generations – this time about the immense experiential value of landscapes and nature that is left without the marks of technological intervention. Added to this emphasis on wilderness landscapes are serious misgivings about the neoliberal approach to managing natural resources that is inherent in the current energy regime. This nature imaginary, although not undisputed, acts as a constraint on further expansion of the energy sector. Despite its basis in environmental concerns, however, it does not connect strongly with discourses of global climate change and any possibilities for halting it or slowing it down.

In this case, where technoscientific euphoria faces the glorification of the wild, adherents of both imaginaries could benefit from a more critical stance towards their own foundational ideas. Icelanders cannot pretentiously claim to be able to fix the global climate crisis on their own, but neither can they abstain from global responsibility when it comes to renewable energy. The crucial question is how such different and perhaps incompatible mental envisionings will affect the future development of the renewable energy landscape. Such development will not only be about the currently most significant energy technologies, geothermal and hydro, but also about other forms of renewable energy, most obviously wind energy. Several wind projects are

entering the planning stage. While there is no doubt that the aeolian conditions are extremely favourable, the landscape impacts of those projects, if realised, will be very significant. It is easy to anticipate a clash with the prevailing nature imaginary. Negotiating this new terrain will require new and sensitive methods for the evaluation of local impacts (Frantál et al., 2017).

Most importantly, acknowledgement and respect of differing imaginaries is a necessary condition for advancing the energy transition. Social imaginaries are surely never static, but constantly undergoing modification. A frank discussion about the ideological and cultural basis of both 'Icelandic' imaginaries is a precondition to their gradual adjustment, or a more radical re-imagining of relations between society, technology, and nature. This could allow for continued development of renewables without irrevocable loss of values to do with nature and landscape. This will not come about through top-down decrees: an open and democratic exchange is needed for the cultivation of new imaginaries.

A wider conclusion to be drawn is perhaps this: the realisation of a renewable energy future globally does not only depend on local physical contexts and available technical knowledge, but also on imaginaries that open new possibilities – or prevent their realisation. I have argued that nonhuman nature needs to be taken seriously in this aspect of energy transitions, in part through its often-veiled role in sociotechnical imaginaries, but also through the formation of specific nature imaginaries that may either be roughly in tune with sociotechnical imaginings or not. The analysis of how diverse imaginaries, contested and conflicting, may be at work in country-specific energy transitions might help in identifying leverage points from which it is possible to work in a small way towards the global transition that is so urgently needed.

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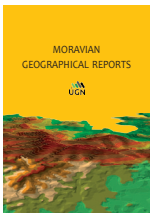

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Measuring environmental and landscape-related potential for tourism development in rural areas and assessment of its co-occurrence with tourist movement: The case of Poland

Marcin MAZUR [a]*, Maria BEDNAREK-SZCZEPAŃSKA [a], Jerzy BAŃSKI [a], Damian MAZUREK [a]

Abstract

The assessment of assets regarding their potential for tourism development is a well-recognised aspect of quantitative geographic research. This paper confines such matters to environmental and landscape-related attributes. The methodological objective is to propose a synthetic index for holistic measurement of a complex system of assets at the local level for Poland's rural areas, followed by its empirical verification. The natural and landscape-related potential of a given area is perceived broadly, as the aspects involved are diverse and complementary: the quality of the landscape, the value of the environment, forest cover, relief, accessibility to surface waters and local bioclimate. The cognitive advantage of this research project is attained by confronting this index against a measure of tourist movement, as well as classifying rural areas by means of combining both dimensions. A considerable number of communes in Poland are characterised by relatively high potential, albeit they are not being exploited for tourism development to a correspondingly large degree.

Key words: *local development potential, tourist attractiveness, local assets, synthetic index, rural areas, Poland*

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1. Introduction

Rural areas possess a variety of tangible and intangible resources shown to be significant for the development of tourism (Bański, 2019). Such items, being employed in this economic sector, are referred to as tourism assets, while the process of their assessment and measurement is known as tourism valuation. The assets in question are (or should be) known to authorities at key spatial tiers – the state, the region or the commune – as well as other institutions and organisations, given their objectives to develop and pursue a more effective tourism policy within the wider context of rural development.

While assessment of assets with respect to their valuable attributes is considered a well-known approach in quantitative research in the geography of tourism, this concept in fact represents one of sub-discipline's more-demanding tasks. One traditional division has been between environmental attributes and those of a non-natural character (Kowalczyk, 2001). Several authors employ the term environmental and landscape-related assets, which more accurately define attributes to be assessed.

The aim of this study is methodological in its attempt to construct a synthetic index of environmental and landscape-related assets for tourism development in Poland's rural areas, which would allow for both quantitative and holistic presentation, ensuring comparability of areas of diverse specificity in this respect.

In the section summing up the spatial differentiation found at present, values for the synthetic index are set against the distribution of actual tourist movement in rural areas of Poland. This provides for a proposed classification of communes from the point of view of the level of use being made of attributes of nature, and the landscape that represents a specific kind of measure of their significance as factors in local development, while also serving to exemplify ways in which the proposed index can be used in practice.

[a] Institute of Geography and Spatial Organization, Polish Academy of Sciences, Warsaw, Poland (*corresponding author: M. Mazur, e-mail: *m.mazur@twarda.pan.pl*)

2. Theoretical background

Natural (environmental) assets are particularly significant in choosing tourist destinations and are considered one of the main factors attracting tourists (Kowalczyk, 2001; Dupeyras and MacCallum, 2013). They represent one of the main purposes for visiting rural areas. Assessment of tourism-related natural characteristics in different spatial units has been the topic of numerous studies conducted in various parts of the world, not the least in Australia (Priskin, 2001), Indonesia (Rahayuningsiha et al., 2016), Nigeria (Obinwanne and Okpoko, 2015), Turkey (Alaeddinoglu and Can, 2011), and Romania (Iatu and Bulai, 2011). Research of this kind most often extends, not only to particular attributes, but also to other elements of tourism space, the aim being to assess aspects such as attractiveness, tourism function and potential. Various methods are employed for this purpose, including simple descriptive ones as well as advanced statistical GIS modelling. Valuation may also draw on the opinions of tourists, experts or inhabitants, in both assessments as such – and the typical approach of assigning rank/weigh to different resources (e.g. Ferrario, 1979; Priskin, 2001; Yan et al., 2017). Research at detailed scales, covering regions or their sections are most common, while there have been very few studies in which a specific method of valorisation of spatial units is applied to the territory of an entire state.

In Polish geography of tourism, nature-related valuation has a long tradition, although today researchers seem to be less attentive to the idea. This article is a continuation of prior achievements in this field. Attempts to assess the natural environment for the purposes of tourism were already undertaken before World War II. The first use of a "quality-class" type of points system was made by S. Leszczycki for assessing recreational attributes of Poland's Podhale region (Leszczycki, 1938). B. Mikułowski (1976) measured attractiveness from a tourism point of view by multiplying the number of attractive objects by defined categories using points total. Considerable input into the development of quantitative means to assess tourism space was made by J. Warszyńska (1974), who applied the so-called "model method" in processing quantitative information on given features of the environment via a defined mathematical function. Traditionally, the main elements of the environment considered in tourism-related valuations have been forest, relief and surface waters.

The valuation of Poland's rural recreational space was also a matter taken up by M. Drzewiecki (1992), who devised a method of assessing communes (in Polish: *gmina*, LAU 2 units) using seven diagnostic features: population density per km^2, proportion of meadows and pastures in arable land, share of forest and waters, proportion of individual (as opposed to collective) agriculture, settlements of defined types, and percentage of the population making a living from non-agricultural sources. After determining threshold values for the listed indicators, this author classified communes in terms of recreation conditions.

Many studies on attractiveness for tourism (*inter alia* in terms of nature and the landscape) have been pursued in Poland, though mainly in relation to the basic units of territorial administration. Exceptions have related to geometrical fields of reference. It needs to be stressed, however, that all were works concerning particular voivodships (provinces, NUTS 2 units) and districts (in Polish: *powiat*, LAU 1 unit at county level) or units within physico-geographical regionalisation. There is then an apparent scarcity of studies seeking to assign value to tourist space at the scale of communes for the entire territory of Poland.

Tourism-valuation research often deploys methods assigning units to quality classes based on certain received points. An obvious flaw in these studies is the typically arbitrary way in which points totals are determined for given features and attributes. Certain authors confer points having compared values for given features in a commune with an average arrived at for their study area as a whole (Parzych, 2010). The most common method nevertheless involves the determination – for the units studied – of values for a synthetic index constructed by weighting different measures (Gołembski [ed.], 2002; Hakuć-Błażowska et al., 2018) but justification for the weighting conferred on particular features is lacking. Weights may also be assigned based on surveys (Bednarek-Szczepańska, 2010).

It is more common to find studies in which measures relating to attributes of nature and the landscape are linked with others in the sphere of tourism management, in order generate a synthetic index of tourism attractiveness (Parzych, 2010; Gryszel and Walesiak, 2014). In turn, by also adding in a measure of tourist movement, an index of the level of development of the tourism function has been devised (Derek, 2007; after Durydiwka, 2012). Only more rarely are features valuable in tourism (be these natural or natural/cultural) treated as potential, the measure of which is then set against another relating to tourism management, so that types of area making differential use of their potential can be identified (Jezierska-Thole, 2007).

The valuations of local assets considering their significance for tourism have usually concerned areas of relatively limited spatial extent, but in fact distinguished by the presence of resources defined as valuable in advance. A plus-point of such studies may thus be the way applied methodology is more or less directed at exposing attributes regarded *a priori* as of greatest importance to the study area. Equally, there is a lack of studies of greater spatial scope, taking in more diversified areas. For many years, that kind of situation was explicable in terms of obstructed or limited access to data. Quantitative conceptualisation of numerous features important from the point of view of tourism required time-consuming measurements made on a detailed scale – hence the typical focus on relatively small areas. Today, however, these difficulties may largely be overcome by using spatial information in the form of digital data, as processed using GIS tools. In connection with this, the work described here took up the challenge of looking holistically at the most important local features of environment- and landscape-related profiles present in the spatially diverse rural part of Poland, as well as conceptualising these synthetically in line with uniform criteria.

3. Methodological assumptions and research procedures

The research entailed development of an abstract model (Falkowski, 1994) of rural tourism space in Poland, with the more specific aim to identify and measure valuable environmental and landscape features. In line with this approach, the model is understood as a hypothetical thought construct involving acceptance of a certain configuration of assumptions (at times clearly subjective), as well as simplification of a defined segment or extract of complicated reality. The objective sees the subject of

the research extracted, with the most important features of its internal structure presented, so that the complexity of the phenomenon under consideration is reduced to a degree allowing for overall understanding (see *inter alia* Rawski, 2011).

Following this approach, the modelling forming the key subject of this study proceeded on a series of assumptions working to achieve simplification, along with highlighting key features. Before developing the synthetic index of assets began, it proved possible to identify three key challenges of a methodological nature. The first involved differences in the significance of various environmental and landscape assets for tourism. This may depend on the preferences that tourists themselves display and is associated with different forms of tourism. Each method of assessment is burdened by a certain subjectivity (Kowalczyk, 2001; Priskin, 2001), and the subject literature's various compilations concerning resources underpinning given any areas' (regions' or localities') natural attributes (and weightings assigned to them) cannot be considered to represent the higher, national level. In this connection, an assumption of the work described here was that the set of diagnostic features used in valuation would focus on assets that are:

- Of key importance, i.e. referred to regularly in the literature, no matter which region is being considered;
- Mutually complementary (not doubling or otherwise reproducing the information expressed); and
- Representative of the different elements of the natural environment (relief, aquatic features, climate, etc.).

Given this way of ensuring by definition that the set of diagnostic features was confined to key ones, it was further decided that equal weight should be attached to each of the diagnostic indices brought together to yield the final value. The studies published so far offer no arguments powerful enough to justify conferring particular weighting schemes on assets contributing to a study of Poland as a whole, albeit targeted at the local administrative level (commune).

In fact, researchers have taken different approaches in this regard. The study edited by G. Gołembski (2002) saw different significances assigned to valuable features (with highest rank conferred upon forest areas and those with access to the sea), but in a purely intuitive way, with no concrete justification made available. A similar situation applied to the work by C. Iatu and M. Bulai (2011), concerning parts of Romania. Those authors adopted a very well-developed set of indices, even as the assumptions accompanying them would seem to raise doubts (e.g. with four times as many points potentially being awarded for relief as for the presence of waters – for no obvious reason). In turn, M. Derek (2008) did not assign weightings to measures representing different tourism-related attributes that comprised a synthetic index of the tourist function.

A second challenge concerns the way the research involves Poland as a whole, and hence an area markedly diversified from the point of view of both nature and the landscape. The attendant assumption was that the adopted assortment of diagnostic features should be "universal", to take account of assets relevant to tourist attractiveness in rural areas up and down the country.

Concurrently, no account was to be taken of assets representing very specific attributes that favour certain specialised and advanced forms of tourism (e.g. caving, climbing, angling, sailing, etc.) (cf. Kowalczyk, 2001).

A third challenge then relates to the need for a compromise between the consequences of the work's Poland-wide scope, and its considerable level of spatial detail, as well as limitations imposed by the availability of data. The basic spatial unit considered the commune, i.e. the unit of local administration of which Poland has 2,477. Like the Atlas of Rural Areas in Poland (Bański [ed.], 2016), this research project assumes that the "rural area" is the combined territory coming under the rural commune category, together with those part of urban or urban-rural communes' set in which a town present has fewer than 10,000 inhabitants. In 2017, the area meeting this definition extended to 86.3% of the entire area of Poland. Ultimately, the work detailed here employed secondary statistical data and indexes calculated on the basis of topographical data, aggregated spatially for a set of communes located in parts of rural Poland (in line with the aforementioned assumptions).

The first stage of the work involved selection of a set of diagnostic features in line with study assumptions, and of potential value in further parts of the study. It was accepted that an overall assessment of tourism-related features valuable from the point of view of environment and the landscape at the level of each commune, should attach key significance to six assets. Namely, they are as follows: (1) quality of the landscape; (2) value of the environment; (3) forest cover; (4) relief; (5) accessibility of surface waters; (6) features of the local bioclimate.

In practice, an area's significance from the tourism point of view is rarely seen to be based on a single asset being present, with a set of qualities instead being required, including but not confined to those of a natural character (Martin, 2005). To achieve quantitative conceptualisation and assessment of each feature mentioned, it was proposed to use the following set of diagnostic indices (w_i):

w_1 – the total area within the forms of areal protection known as Landscape Parks and Areas of Protected Landscape, as related to commune area (GUS, 2017);

w_2 – the total area of National Parks and Nature Reserves, as related to commune area (GUS, 2017);

w_3 – the share of the commune's land cover accounted for by forest (GUS, 2017);

w_4 – the average slope inclination of land in the commune (DEM – 100-meter grid-size);

w_5 – an index of accessibility to surface waters;

w_6 – an index of the stimulating effect of climate and health-related features.

The selection of each attribute and its expression using a defined index is linked with the adoption of further model assumptions, with a certain influence obviously being exerted on the result obtained. Considerable emphasis is thus put on full justification of our decisions.

Areas with attractive landscapes epitomise a key valuable feature helping sustain mass tourism (Kowalczyk, 2001). This is particularly the case for tourism in rural areas (including the more specific "rural tourism"), in which landscapes are seen to play their roles (Daugstad, 2008; Jepson and Sharpley 2014). "Picturesque scenery" is renowned as a prevalent element in tourists' imaginings when it comes to rural areas and the countryside (Aznar et al., 2007; Dubois et al., 2017; Frisvoll, 2013). Likewise, landscape is one of the key component parts of the "countryside capital" that tourism is based on (Garrod et al., 2006). Areas featuring landscape values are covered

by dedicated protection forms in Poland. Their share in the area of the commune was adopted as an index of landscape quality.

In the public consciousness, a rural area is likewise associated with nature and the natural environment (Jepson, 2015). Researchers apply the concept of *naturophilia* as they define a trend present in contemporary tourism to attach great significance to valuable natural assets and their protection. An interest in nature also reflects an increasingly higher level of environmental consciousness among tourists (Gossling and Hickler, 2005). Environmental values of rural areas were determined by a measure of the proportion of the commune area made up of National Parks and reserves. The literature most often features a different approach, whereby researchers apply a single measure encompassing all areas enjoying legal protection (e.g. Derek, 2008; Gołembski [ed.], 2002). Certain reservations can be expressed regarding this tactic, however, as the forms taken account of may differ markedly in terms of the subject of protection.

The presence of forests, especially large ones, is of significance in meeting tourism-related and recreational needs (Gossling and Hickler, 2005). Furthermore, it is anticipated that such importance will be greater in the future (Gossling and Hickler, 2005). Forest cover is in fact the index deployed most widely in tourism-related valuations.

In turn, while waters are regarded as one of the most precious attributes from the point of view of tourism (Jones et al., 2005), these attributes can still be omitted in research dealing with large sets of spatial units, because of the sheer difficulty of obtaining relevant statistical data (e.g. Derek, 2008). For similar reasons, researchers' assessments of assets valuable with respect to tourism often neglect the aspect of relief – even where an inquiry deals with mountainous areas (e.g. Gryszel and Walesiak, 2014). Relief is nevertheless regarded as a key environmental aspect determining the attractiveness of a given rural area for tourists (Durydiwka, 2012).

Climate obviously affects choices of tourist destination (Hamilton and Lau, 2005). On the global and continental scales, it is decisive as in the distribution of the main areas of mass tourism of the "3S" type (cf. Becken, 2010). Equally, it may be of importance locally as well (Martin, 2005). At this local scale, a crucial role in tourism is played by bioclimates (Krzymowska-Kostrowicka, 1997; after Derek, 2008; Knezevic, 2008). Bearing in mind the extent of the study area (located entirely within a single climatic zone), it was assumed that features of local climates are matters of overriding significance for the spatial differentiation of climatic impacts on tourist attractiveness, particularly when it comes to stimulatory effects.

While the first four indices are relatively simple constructs, w_5 and w_6 do require some more explicit comments. The w_5 index is a ratio between the conversion index for the area of surface waters (P_{wp}) and the overall area of a given commune (P_g). The category of a conversion index is introduced to take account of the differentiated inputs of the sea, a lake or a river on attractiveness to tourists. There is no doubt that the sea is of greater importance to tourism than a lake, while the latter is in turn more attractive than a river (cf. Gołembski, 2002) – hence the need for such a distinction to be drawn. The w_5 index was calculated according to the formula:

$$w_5 = \frac{P_{wp}}{P_g} = \frac{3\times P_m + 2\times P_j + P_r}{P_g},$$

where P_m is the area of land located up to 5 km from the seashore; P_j is the area occupied by lakes or located within 5 km of a lake shoreline (albeit not meeting the criteria qualifying it for inclusion within the P_m category); P_r is the area occupied by rivers or canals, or located within 5 km of such a feature (albeit not meeting the criteria for inclusion within the P_m or P_j categories).

The source of data on the different categories of surface waters was Corine Land Cover dating from 2012. Its defined (constant) level of spatial resolution provides for comparability of the index values across Poland, due to the standardisation of: a) the criterion of the size of bodies of water and watercourses taken account of, as well as b) the level of detail of the spatial generalisation thereof.

The value of the w_6 index was calculated by reference to: a) bioclimatic data for Poland after the map of T. Kozłowska-Szczęsna (1994) – as the mean rank for the stimulatory effect of the bioclimate as weighted by the area of occurrence within the commune (P_b); as well as b) the locations of health resorts (U). This is expressed by the equation:

$$w_6 = P_b + U = \frac{\sum_{r=0}^{3} r\times P_{b,r}}{P_g} + U,$$

where P_b is the area of the commune by different categories of stimulatory impact, in which:

$$r = \begin{cases} 0 \textit{ rates an area whose stimulatory impact is weak} \\ 1 \textit{ rates an area whose stimulatory impact is mild} \\ 2 \textit{ rates an area whose stimulatory impact is moderate} \\ 3 \textit{ rates an area whose stimulatory impact is strong} \end{cases}$$

and U – is the health resort index, in which:

$$U = \begin{cases} 0 \textit{ rates a commune in which no locality enjoys health} - \textit{resort status} \\ 2 \textit{ rates a commune in which locality enjoys health} - \textit{resort status} \end{cases}$$

In the cases of both of the indices described, certain values were adopted arbitrarily and thus require further discussion. Some are determined by reference to accessible data, e.g. resolution of Corine Land Cover images defining the level of detail for surface waters taken account of in research. Other values adopted arbitrarily were determined by applying the expert method. The subjectivism of this kind of approach needs to be seen as an inseparable aspect of each instance of modelling geographical space (including as regards tourism). In this sense it is no different from the arbitrary (if more or less universally accepted) decision to aggregate data, as well as research results, by reference to Poland's administrative division at the level of the commune, and even therefore the criterion for the study area adopted here which sees sharp boundaries delimiting the rural area.

Here it further needs to be noted that arbitrary decisions taken in regard to two indices described have only a limited influence on the value of the synthetic index. This reflects the way in which they account for only one-third of the weighting attributable to all six variables. Moreover, adoption of: a) determined weightings of different categories of water for the overall calculation; b) determined distances to surface waters delimiting an "area of enhanced tourism attractiveness"; c) a determined rank for different stimulatory levels of the climate, as well as d) a determined influence of health-resort status on the ultimate value assumed by the w_6 index, means that a considerable share of impact on index values noted from one commune to another is exerted, leaving only a relatively limited influence for the actual hierarchy of communes and the overall distribution of areas with high or low index values. For instance, the adoption of a defined

distance from surface waters is of marginal significance as regards hierarchy of spatial units, when we note the local extent of areas considered "attractive" in the context of a nationwide scope of research. Irrespective of the distance adopted, the given areas are located along the shoreline of the same body of surface water or watercourse. Equally, in line with the means of transforming statistical values for the diagnostic indices in the second phase of the valuation, a major role is played by the hierarchy of spatial units, with the importance of differences in values for various diagnostic indices being leveled out to a considerable degree.

The second stage of the valuation was intended to offer a synthetic conceptualisation of the state of six diagnostic features taken account of in each studied commune j, with these being expressed along one axis of valuable environmental and landscape-related assets, due to the use of the synthetic index W_{pk_j}. This objective was achieved through normalisation of the values for different diagnostic indices in commune j (w_{ij}), with these being expressed by reference to a synthetic index (W_{ij}). The expression of the same measure was achieved subsequently in terms of the arithmetic mean of component values ($\overline{W_j}$), as calculated in line with the equation:

$$\overline{W_j} = \frac{\sum_{i=1}^{6} W_{ij}}{6}$$

The aforementioned joint measure from different W_{ij} component values, as well as the W_{pk_j} synthetic index, was the probability of the obtainment at random of a value lower than the empirical one recorded in a given commune. That probability is a left-hand-side value in the cumulative distribution function f_i (w_{ij}), which fits best to the empirical frequency distribution of the given index w_i. In this connection, in the case of commune j:

$$W_{ij} = F_i(w_{ij}) = \sum_{k:w_{ik} \le w_{ij}} f_i(w_{ik})$$

It is most typical for this kind of analysis (i.a. synthetic Perkal or Hellwig measures) to assume *a priori* that the most optimal reference is a theoretical normal distribution $N(m,\sigma)$. However, in the present study, it would be an over-simplification to adopt an assumption of this kind, as most applied diagnostic indices serve to register "rare goods" in analysed tourism space, in connection with which there is natural tendency for it to be characterised by a markedly positive (right-sided) skewing of the frequency distribution.

The same measure as with component values was also expressed by reference to a synthetic index of environmental and landscape-related assets for tourism development of commune j (W_{pk_j}) Its ultimate value is therefore the probability that an arithmetic mean derived from random values for the six components ($\overline{W_j} = \frac{\sum_{i=1}^{6} W_{ij}}{6}$) is lower than the mean derived from component values relating to commune j ($\overline{W_j}$). Once again, this is the left-side value of the cumulative distribution function:

$$Wpk_j = F(\overline{W_j}) = \sum_{k:\overline{W_k} \le \overline{W_j}} f(\overline{W_k})$$

In this case, however, the central limit theorem gives rise to an assumption that the empirical frequency distribution for the index that is the arithmetic mean of uniformly normalised values for independent variables coincides with the normal distribution $N(m,\sigma)$. In connection with this, the cumulative distribution function in the case of the synthetic index W_{pk_j} is:

$$F(\overline{W_j}) = \Phi_{m,\sigma}(\overline{W_j}) = \frac{1}{\sqrt{2\pi}} \int_{-\infty}^{\overline{W_j}} e^{-\frac{1}{2}t^2}\, dt$$

The synthetic index W_{pk_j} was ultimately therefore expressed on a scale of 0–100%, where empirical values cannot be boundary values.

Notwithstanding a quite complicated procedure, this solution has the advantage of exceptionally clear interpretation of an obtained value for the synthetic index as compared with the indices applied most often in human geography. Also important is the way in which a value for the proposed synthetic index is relative, as it positions particular spatial units in relation to other elements of the given dataset over a defined time interval. The results of applying the described valuation method to another area, to another set of spatial units in the same area, or to another time interval, should therefore involve comparison as regards spatial structure, rather than in relation to concrete values.

A further stage saw the spatial distribution of W_{pk_j} values in communes set against the distribution of tourist movement, as measured in terms of the numbers of Polish tourists staying overnight in 2014 (R_{t_j}). This adopted measure of tourist movement is merely one of the possible ways of conceptualising the phenomenon (and in fact reflects just a small part of the overall spectrum of aspects). However, given the methodological objectives of this paper, this one-dimensional approach to the issue of tourism appears to be appropriate for the purpose, providing an example and illustrating how valuation results can be employed in practice to assess the distribution of tourism. In line with the cognitive goals, other measures of the development of tourism could be subject to analogous verification.

The co-occurrence of two features of rural space set against each other was assessed using a boundary value for the statistical significance p for obtained Pearson linear correlation coefficients: $r_{xy}(W_{pk_j}, R_{t_j})$. Then, through comparison of values for each of the two compiled indices with the arithmetic means (respectively equal to 50% and 3,346 tourists a year), it was possible to designate four categories of rural areas in line with the use made of tourist assets (Fig. 1).

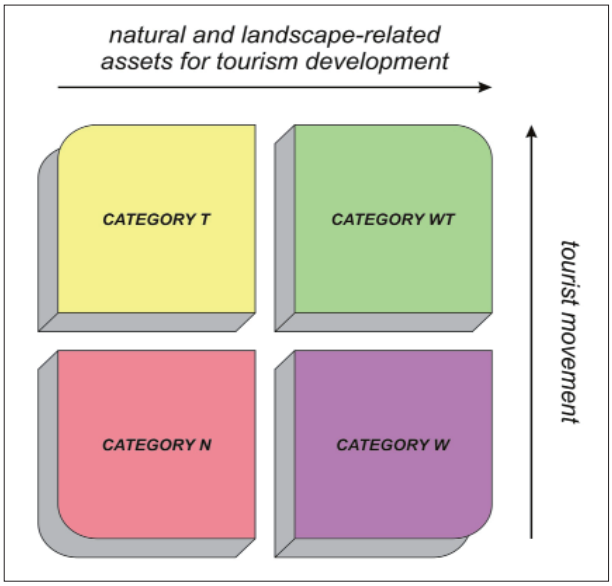


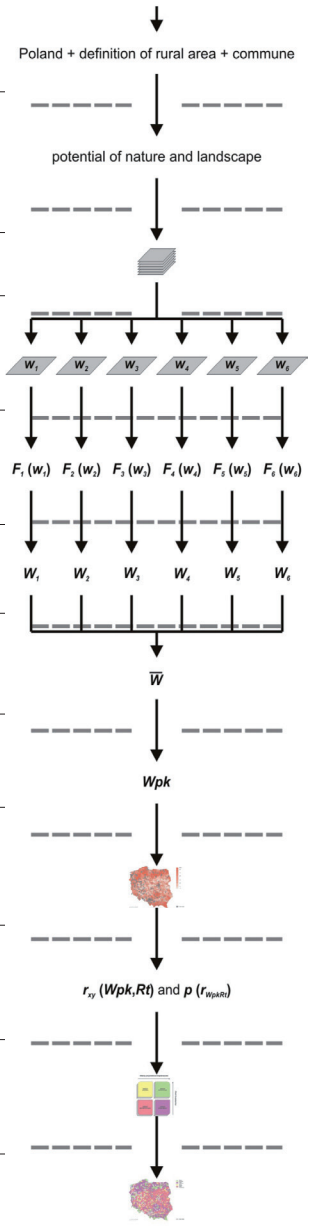
Fig. 1: Categories of rural areas as regards environmental and landscape-related assets for tourism development and tourist movement. Source: authors' elaboration

Areas in the "WT" category have features highly valuable from the point of view of tourism. They see use made of conditioning arising out of nature and the landscape that favours tourism, with the effect that tourist movement is of above-average intensity. In turn, "category T" areas are those in which tourism is developing intensively, even though they do not stand out for their particularly high values for natural and landscape-related features. They may thus be defined as areas of "local tourism success", given that the basis lies in features other than those of environment or the landscape (for example relating to ease of access from a large city and/or a high level of development of relevant infrastructure). That leads to areas in category "W", in which there is no high-intensity tourist movement despite the presence of highly valuable features. Resources here therefore go unused or underused by tourists, because of barriers or obstacles of one kind of another (e.g. infrastructural), unsuitable management of this sector's development locally, or even a conscious decision in development strategies to favour alternative priorities for the commune or higher-order unit of administration. Finally, category "N" relates to non-tourist areas which do not stand out in terms of assets and – in a sense justifiably – have no tourist movement of above-average intensity. Table 1 presents the entire research procedure applied, along with its chronology.

4. Results

The spatial breakdown of values for the synthetic index W_{pk} is in line with the widely-known distribution of areas in Poland most important for tourism (Fig. 2). These are first and foremost mountainous or hilly parts of the south; as well as the Świętokrzyskie Mountains; the Jurassic limestone landscapes in the Kraków-Częstochowa area; Roztocze; the Pomeranian, Mazurskie and Suwalskie

Stage	Task	Method	Result	Scheme and symbolization
Preliminary assumptions of the valuation	Designation of spatial scope	Delimitation of study area	Determined extent of area studied and set of fields of reference	
	Designation of subject scope	Review of subject literature	Valuation name	
Valuation stage I (Analysis of assets)	Identification of key assets		List of diagnostic features	
	Quantification of key assets	Review of sources of data, statistical transformation of data and spatial re-aggregation	Values of diagnostic indices for different fields of reference	
	Matching of theoretical frequency distribution to empirical distributions of different diagnostic indices	Least-squares error method	Theoretical frequency distributions and parameters for different indices	
	Normalisation of diagnostic indices	Left-sided distribution function of theoretical frequency distribution	Six component values for different fields of reference	
Valuation stage II (Synthetic conceptualisation of assets)	Synthesis of analysed assets	Arithmetic mean	Mean component values for different fields of reference	
	Normalisation of synthetic index	Left-sided normal distribution function fitted using least-squares method	Value of synthetic index for different fields of reference	
	Assessment of spatial differentiation characterising assets	Cartographic method of presentation (cartogram)	Map of synthetic index of analysed assets	
Distribution of valuable assets against distribution of tourist movement	Statistical assessment of co-occurrence of tourist movement and analysed assets	Pearson linear correlation and limit values for its statistical significance	Value of linear correlation and its boundary level of significance	
	Identification of main categories of area in terms of tourism-related use made of analysed assets	Two-dimensional classification of spatial units	Subordination of type to different fields of reference	
	Assessment of co-occurrence of tourist movement and analysed assets across space	Cartographic method of presentation (quality background method)	Map of distribution of communes by type	



Tab. 1: Chronology of research procedure
Source: authors' conceptualisation

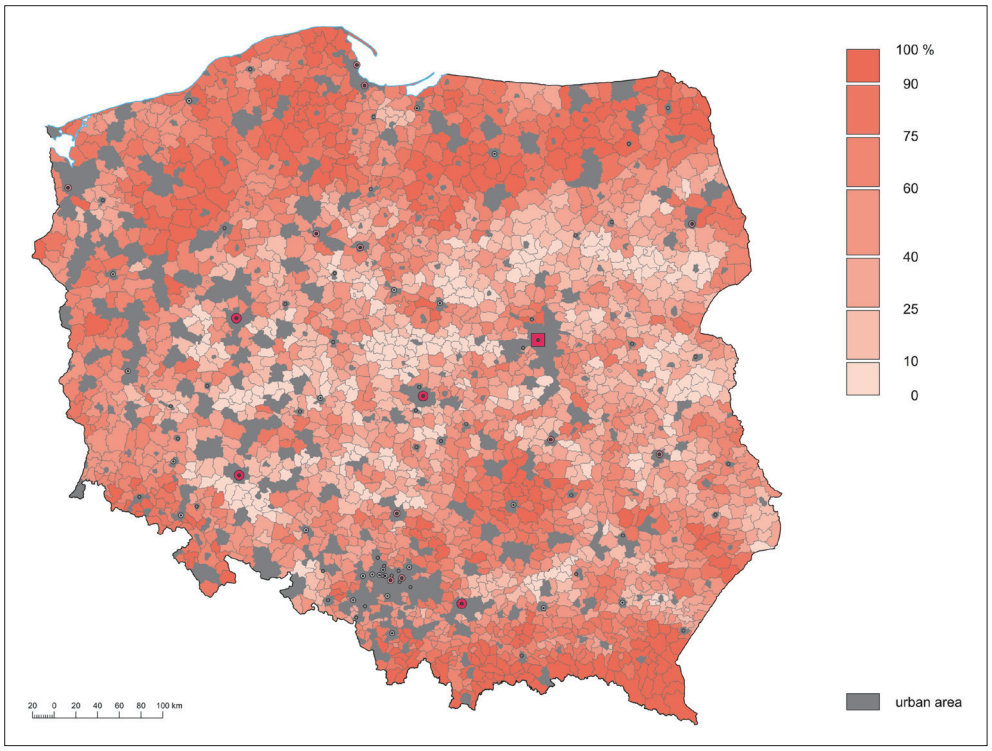


Fig. 2: The synthetic index of environmental and landscape-related assets for tourism development (Wpk)
Source: authors' elaboration

Lakelands; and the Baltic coast. At the absolute top of the ranking, more of the communes involved are located in the Carpathians than anywhere else. A value above 99.5% was achieved by two communes, i.e. Czorsztyn (in the district of Nowy Targ) and Lesko.

The largest area with communes achieving very high scores is in turn the country's Lakeland belt. A result above 95% was achieved by 125 units, or 6% of all communes in the country. Indeed, in Warmińsko-Mazurskie Voivodship, communes in this category account for as many as 27.2% of all of those analysed (as compared with figures of 15.6 and 15.0% in the cases of Małopolskie and Pomorskie Voivodships).

In contrast, lowest values for the index characterise parts of central and eastern Poland, with its relief of limited diversity, a low level of forest cover and a lack of large water bodies. In the rural parts of as many as 4 voivodships (Łódzkie, Mazowieckie, Opolskie and Wielkopolskie), there is not even a single commune with a W_{pk} value above 95%.

The distribution of tourist movement in rural areas, as measured in terms of the number of tourists staying overnight in communes, is correlated with values for the index representing these localities' attributes of nature and the landscape (Fig. 3). The value of the coefficient for the Pearson linear correlation $r_{xy}(W_{pk_j},R_{t_j})$ is of + 0,215, with n = 2,073 observations (units of administration). This achieves statistical significance at a very high level, the boundary level for this result being $p = 3.6 \times 10^{-23}$.

Equally, tourist movement in rural areas of Poland, as registered by Poland's Statistics (GUS), proves to be highly concentrated spatially – which is to say that it focuses on an area far smaller than that actually found to feature very high index values. An above-average number of individuals taking overnight stays in a given year is only characteristic for 19.4% of communes in the study area. Even among communes proving to have very valuable environmental and landscape-related assets (given W_{pk} values above 95%), only 56% are actually found to have such an above-average figure for visits.

At this point it should be stressed that the relatively low value for the linear correlation and high spatial concentration of tourist movement *inter alia* reflects the way in which GUS data on tourist movement completely (or almost completely) fail to take account of numerous agritourist premises scattered across rural areas, as well as other places operating on the small scale but nevertheless making guest rooms available. Thus, the intensity of tourist movement in rural areas assessed solely on the basis of data from GUS is bound to be underestimated. At the same time, there is no up-to-date database encompassing the full set of premises offering overnight accommodation as a small-scale activity that are present in different communes. Indeed, it is even difficult to state how many of these may exist in total

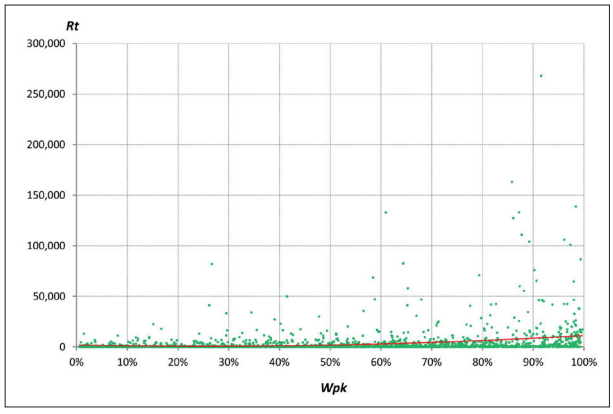


Fig. 3: Correlation between tourist movement (in terms of numbers making overnight stays – R_t) and the synthetic index of environmental and landscape-related assets for tourism development (W_{pk}), by commune in 2017
Source: authors' calculations

across Poland. One must also stress the way in which no notice is taken of tourist movement not needing to resort to overnight accommodation.

There is fundamental cognitive value to this study's spatial breakdown for the four categories of rural area identified by reference to the use (or lack of use) tourism makes of valuable environmental and landscape-related assets that have been identified (Fig. 4). Several key conclusions are to be drawn from it. The "WT" areas (active in tourism and with very valuable environmental and landscape-related assets) represent a relatively small number of communes concentrated in just a few places – the Bieszczady, Tatra, Pieniny and Beskid Żywiecki mountain ranges; the Kłodzko Valley; the Karkonosze Mountains; the coastal communes; the Kaszubskie Lakeland; a contiguous complex of communes in the Warmia and Mazury region; and just a few in the Suwalskie Lakeland and Świętokrzyskie Mountains. Remaining parts of the country generally have only single communes worthy of inclusion in the category in question. In Dolnośląskie Voivodship (Lower Silesia), above-average tourist movement is to be noted in all four such communes, and in Kujawsko-Pomorskie Voivodship the same is true of the two communes with a W_{pk} value exceeding 95%, while movement at this level characterises 31.8 and 16.3% respectively of all communes in these voivodships' rural areas.

On the other hand, as many as five voivodships have a majority of their communes characterised by the highly-valuable attributes that a W_{pk} value over 95% indicates, while still only having below-average tourist movement by Polish standards. In particular, there is only limited optimisation of the distribution of tourist movement in Zachodniopomorskie Voivodship (Western Pomerania), where there is above-average tourist movement in 22.5% of all communes studied, with only 30.0% having W_{pk} values above 95%; as well as in Śląskie Voivodship (Silesia), where the corresponding values are 25.0 and 33.3%. In the first case, considerably more-intensive utilisation in tourism is a positive feature reflecting a coastal location, rather than any greater diversity of resources in the Lakeland belt. In the case of the second of the voivodships mentioned, the communes with the most valuable assets are concentrated in the Beskid mountain ranges, along the southern border of Poland – which is to say areas least accessible from the point of view of transport. The remaining three voivodships in which a majority of communes with very highly valuable assets fail to stand out by having above-average tourist movement are located in eastern parts of Poland. These are Podlaskie and Świętokrzyskie (with 40.0% of communes in each experiencing above-average tourist movement); as well as Podkarpackie Voivodship (47.4%).

The greatest numbers of communes are assigned to categories "W" (with valuable features of nature and the landscape that are going unused) and "N" (for non-tourist areas). The former are mainly in the north and south, and often form a kind of "buffer zone" around markedly tourism-focused areas. It would seem that competition with nearby areas important for tourism (which are distinctly concentrated) impedes development in this sphere in category "W" areas. On the other hand, were account to be taken of tourist movement to premises supplying agritourism services or operating guest rooms, this would probably modify the assignment of communes to the two categories referred to. Furthermore, as has been noted already, there are no data on which to base an unequivocal claim that "WT" communes would gain at the expense of those in category "W" if account were to be taken of these kinds of facilities.

Areas in category "N" form the largest complexes in Mazowieckie, Podlaskie, Kujawsko-Pomorskie, Łódzkie and in Wielkopolskie Voivodships. Their distribution bears a close resemblance to that of areas characterised by a low level of development of the tourism function identified in the research by M. Derek (2008). Interestingly, prevalently non-

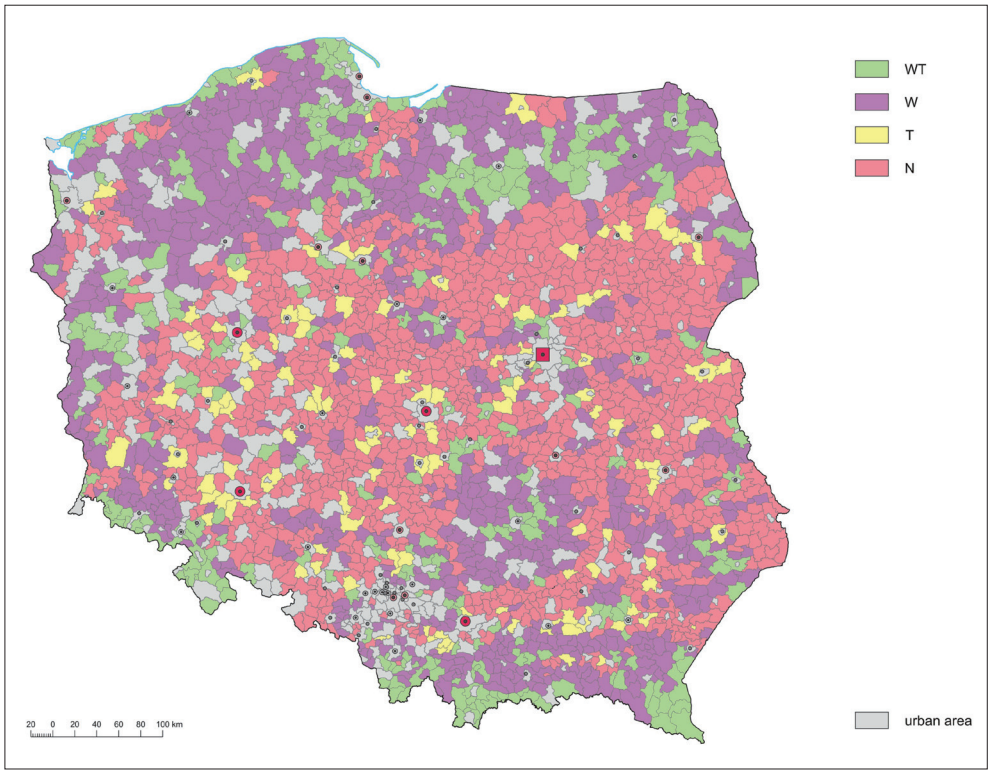


Fig. 4: The distribution of categories of rural area in terms of the utilisation of environmental and landscape-related assets for tourism development. Source: authors' elaboration

tourism areas only occasionally include communes enjoying success – these most often being located in the suburban zones of voivodship capitals and regional centres. These are probably areas playing host to weekend trips taken by individuals or groups, in which many premises providing for overnight stays are located. It can be anticipated that these are also objects rendering services to firms and schools, and catering for various one-off events. The existence of successful communes attests to the way a high level of development of tourism can be achieved in places with environmental and landscape-related assets of only limited value (Bednarek-Szczepańska and Bański, 2014). Equally, this can be presumed to require the establishment of an excellent and often highly-specialised tourist product.

5. Discussion

A discussion of these results can give valuable input to the current state of knowledge within each aspect of concern: cognitive, methodological and application orientations. In the first case, the proposed measure has been dedicated to the recognition of the environmental and landscape-related background for the development of tourism within rural areas. Obviously, this is not the only group of determinants, although researchers agree that in the context of such territories, probably the most important one. Therefore, these conditions are not able to provide an explanation for the variability of all tourist spaces but captured together within a one-dimensional index, seem to be an adequate case study of the analytical (reason-effect) approach. Moreover, if merged with using new spatial data sources and technological tools of analysis for extending the spectrum of diverse features taken into account by means of introducing other dimensions, it can reflect the broadly understood potential for tourism based on natural and landscape assets even more comprehensively than classical research on its quantitative assessment. Various indexes related to the traditional triangle – relief-land use-surface water (e.g. Drzewiecki, 1992) – can be enriched significantly by taking into consideration the value of the environment, local bioclimate and landscape. Each of these aspects is inter-related to the triangles studied previously. Nevertheless, it makes the subject of the interest essentially more extended and delivers some independent informative value. Regardless, as each of three non-standard dimensions can be discussed, transformed, or even undermined as being independent and of crucial importance, they are still valid as indicating a potential field of future methodological development. Another outcome relates to empirical study of the impact of particular dimensions on the actual assessment of environmental and landscape attractiveness by tourists. The equal weights proposed here are just an optimal starting point for further targetted discussion.

It is also worth mentioning that applying new data and technical infrastructure enables not only cognitive extension of a synthetic index, but also the spatial range and resolution of the analysis. This is not only a matter of a simple extension of the area to be studied. Using local units allows researchers to consider deeper insights into the spatial diversity of any rural area within particular regions. As a principle, however, taking into consideration a larger set of local units allows researchers to achieve comparability of the assessment across the regions in relation to studies undertaken independently for each of them. This factor exerts an essential impact on the results if the point of reference relies on the characteristics of a full set of spatial units to be analysed (e.g. Gryszel and Walesiak, 2014). For instance, the peripheries of regions having the highest potential for tourism development are assessed as uncompetitive if such a region is the only one to be studied, while the foothills, central Pomerania or the outskirts of Mazurskie Lakeland have still a great potential on the Polish background (see Fig. 2). Of course, one may emphasise that their position in relation to a close alternative destination matters, but also important advantages and synergies of being adjacent to the best-known tourist destination cannot then be omitted (complementing and specialisation, common regional marketing, etc.).

The cognitive value of these results strictly depends on methodological aspects of the research. Therefore, it is equally important, at least. As the synthetic index was being developed, much attention was paid to the statistical issues – with the ultimate result that a relatively complicated procedure was applied. While this did not influence excessively the overall spatial structure of the results obtained in comparison with studies applying standard methodology, two very important achievements at the stage of elaboration need to be noted.

In the first place, evident benefits arise from the consistent expression of different indices using a measure of the probability of a "worse" result being obtained by the random selection of values for the variables considered, than for empirical values noted in a given commune. This measure is much less abstract in nature than the synthetic indices applied typically in Human Geography, as well as in work on the development of tourism – such as the number of standard deviations, the Euclidean distance or the model lodged in multidimensional space (e.g. Gryszel and Walesiak, 2014). A probability in and of itself confers particular information on the spatial unit being described, even without values in other units needing to be evoked, or descriptive statistics for the whole set of data studied. This supports a perception of result content whose interpretation becomes more intuitive.

In the second place, an advantage of this measure is that the empirical frequency distribution which is quite close to a constant across the whole range of variability (limited on both sides). This ensures that values departing markedly from the mean do not impose a burden of differentiation from remaining values to the extent that they do with the most popular synthetic measures. The latter's universal application of standardisation and rejection or correction of values deviating from the mean beyond two standard deviations only partially evens out this unfavourable effect. In this connection, the result obtained using the method proposed here is much more useful as a component part of further analyses. An example may be furnished by this study's attempt to employ results from the valuation relating to environment and the landscape to assess how optimised the distribution of tourist movement as compared with types of valuable features is, and how adjusted in line with the assets that do exist. This attempt may also be assessed positively in terms of its effects. Two approaches to such an activity are possible. Where the priority is an overall assessment of the scale of the co-occurrence of these phenomena, the frequency distributions for the two measures should be transformed to show significant similarity to the normal distribution. In this study, no such transformation was performed, as this would have distorted empirically observed differentiation of index values in the entire assortment of communes in Poland's rural areas – being of major significance in the case of the adopted measure of tourist movement in particular. A second

approach gaining application here was the one in which the priority is to reflect the spatial structuring of the co-occurrence between two studied phenomena, with account taken of the spatial concentration of an index serving as the dependent or response variable (i.e. in this case, tourist movement).

The third key area of discussion involves applications. Two issues need to be emphasised in this regard: the analytical approach to the study, which focuses on the sphere of conditions for tourism development, and the problem of the intersection of continuous tourist space by artificial sharp boundaries of administrative units. It has been validated that the analytical approach to tourist space, with strictly distinguished spheres of conditions (assets) for tourism development and spheres of their effects (infrastructure, management, revenues etc.), gives a new perspective and applications opportunities. Therefore, in opposition to the research perceiving the entire tourist space as one complex system of relationships, impacts and feedbacks (e.g. Derek, 2007), its results can be compared with a measure of a given area's actual performance regarding tourist function development. The proposed approach can be applicable whenever one needs a tool for an identification of tourism relative underdevelopment within particular areas or searching for good practices within the areas of its relative overdevelopment. As such, it is not to be assessed as better or worse, but undoubtedly delivers cognitive added value, giving a new perspective.

Achieving valuation of attributes of nature and the landscape within the framework of a spatial model that features sharp boundaries between spatial units, especially where these are based around the administrative division of Poland, is problematic. A basic condition for that to be the case is naturally a spatial aggregation of numerous statistical data. An advantage of the solution from this research is the possibility of obtained results being referred directly to the administrative units responsible for shaping local development, including the development of tourism in rural areas. The effect is to raise the applied value of the study. On the other hand, it is clear that this benefit was gained at the expense of an "unnatural" way of aggregating data describing some of the assets that were studied, this leading to a certain distortion of tourism space in rural areas within the framework of the developed model.

Nevertheless, consciousness of the spatial aggregation of environmental and landscape-related assets is still a superficial insight into the problem of the model of tourist space. It is worthwhile to emphasise that it also denotes neglecting the movement between different localities and units of administration. Therefore, the tourist attractiveness of a given commune has a certain impact on the value that can be assigned to neighbouring units of administration at that local level. To take that into account, a further stage of the research would entail a transformation of the spatial portrayal obtained, using a solution that would correspond with the low-pass convolution (smoothing) filters used in the analysis of raster images. Among the latter, there are linear filters (using different kinds of distance function, such as the moving or rolling mean, weighted mean, reciprocal, power function, exponential function, Gaussian function, etc.), as well as non-linear ones (usually based on parameters for the statistical description of the vicinity) (Hsu, 1975; Glassner, 1995). In the case of cartographic depictions, an analogous effect is obtained by using smoothing interpolation (Mościbroda, 1999), especially methods of smoothing cartograms like the areal-raster method of moving means (Mościbroda, 1999), re-aggregation methods (Kolberg, 1970), or the so-called "pycnophylactic" methods (Tobler, 1979). This issue, however, signals a separate methodological concern extending beyond the sphere of interest of the present study. This is *inter alia* true when it comes to assessing the degree to which attributes raise the attractiveness of an area for different kinds of tourism, as well as the mathematical description of distance decay in this area (a function detailing the decline in the significance of different attributes in line with distance), and the method that is used to smooth the cartographic depiction.

6. Conclusions

The developed index of environmental and landscape-related assets for tourism development (W_{pk}) provides a characterisation and synthetic assessment of the features of this kind present in Poland's rural areas and related to an important significance in tourism. As it comprises six very diverse, but at the same time complementary diagnostic characteristics, the index is rendered relatively objective. Three of the assets (relating to relief, surface waters and forest areas) represent fundamental components of the natural environment, while two others assess environmental and landscape value by reference to the presence of different categories of protected area, and one relates to health aspects (including air quality).

The assessment has made it clear that many of Poland's communes are characterised by relatively high values. In many cases, however, these assets are not taken advantage of in tourism development. Dormant potential relating to environment and the landscape may of course be mobilised in such areas, as efforts are made to increase attractiveness to tourists. These could include marketing and promotion measures, efforts to revitalise villages or to develop dedicated tourist (or "para-tourist") infrastructure, new developments specifically designed to bring people in, and so on. These are subjects for an in-depth discussion beyond the scope of this paper.

It should be emphasised that the synthetic index of environmental and landscape-related assets for tourism development reported here, is proposed as just one of many possible measures by which tourism's actual state of development can be assessed. This approach has allowed the identification of four categories of rural area in relation to which it would be possible to propose different strategic actions ranging from action being unjustified in non-tourism areas, through to intensified steps in some areas that do support tourism, where assets of nature and the landscape are highly valuable, but tourism has not yet been activated to a great extent. It would be equally possible to analyse correlations between the index proposed here and other measures, such as valuable features that are not related to nature, or to measures related to the management of tourism. Undoubtedly, there could be different important conclusions drawn regarding the development of tourism in rural areas. Equally, there should be defined categories of 'area' or 'locality' established in the process.

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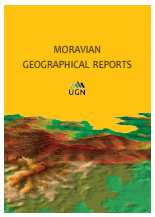

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General population perceptions of risk in the Covid-19 pandemic: A Romanian case study

Liliana POPESCU [a], Cristiana VÎLCEA [a *]

Abstract:

The COVID-19 pandemic has created complex socio-political situations, as the health crisis was paralleled by the reshaping of lifestyle patterns and induced severe economic changes. By means of an online survey, this study aims to investigate the population perceptions of risk in Romania: it examines important psychological and social factors related to risk perception and behaviours, as well as attitudes toward quarantine and physical distancing. By means of statistical analysis, the data were analysed and a GIS environment was used to visualise data distributions. Our findings indicate that if the perceived risk associated to the epidemic is high, people will change their normal behaviours, adopt preventative measures, adhere to strict hygiene practices and are willing to self-isolate for the benefit of their peers, which they tend to see as running a greater risk than themselves. Women and people with higher educational status tend to be more worried about the current situation, but regarding the severity, almost all men believe they would risk a severe state if infected. In conclusion, the perception of high risk associated with COVID-19 can lead not only to positive behavioural changes (mainly physical distancing and improved hygiene), but also to a rapid mobilisation and active involvement of communities, which are vital for stopping transmission of the virus.

Key words: *risk perceptions, online survey, public health, hot spot areas, Romania*

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1. Introduction

Throughout the centuries, humankind has experienced numerous major virus outbreaks, yet none has had such a thorough documented evolution and media focus as the Covid-19 pandemic. As the number of infected persons grew exponentially and new cases spread throughout the world at a fast pace, governments of more and more countries responded to the pandemic by initially implementing travel restrictions for non-citizens and non-residents, then urging the population to respect social distancing, which is also geographic (Klapka et al., 2020), and subsequently imposing drastic lockdowns.

To control the spread of COVID-19 in Romania, public health officials urged physical distancing and strict hygiene practices. Consequently, on February 26th, the same day the first case was confirmed in Romania, the Ministry of Health issued an order enforcing the quarantine for persons that returned from areas with a large community spread of the virus. The reaction of the Romanian government was very early, quick and extremely cautious, with numerous preventive measures at the very beginning of the epidemics in Europe (see Fig. 1). At the beginning of March, the same day Italy declared lockdown, Romania shut down schools and kindergartens, although having registered only 10 confirmed cases of COVID-19, and then followed only two weeks later, on March 25th, by the country lockdown (903 confirmed cases). Similar actions were taken throughout Eastern Europe as fear of underfunded and struggling healthcare systems being quickly overwhelmed, helped with decisiveness (Walker and Smith, 2020; Popescu, 2020). Hence, Poland, Hungary, the Czech Republic and Slovakia have drawn praise for taking swift action (Bostock, 2020) and largely avoided the coronavirus first wave (Guenfoud, 2020). Although Romania is not ranked among the countries with a serious crisis generated by the pandemic, it is important to highlight the fact that during the early phases of the outburst in Europe, there were several hundred thousand people[1], mainly

[a] Department of Geography, University of Craiova, Craiova, Romania (*corresponding author: C. Vilcea, e-mail: *cristiana_oana@yahoo.com*)

[1] In just 2 days, 11–12 March 2020, there were 107,000 persons that entered Romania, coming mainly from Western Europe, and more than 40,600 returning during February 26th – March 10th, 2020 (Romanian Border Police 2020).

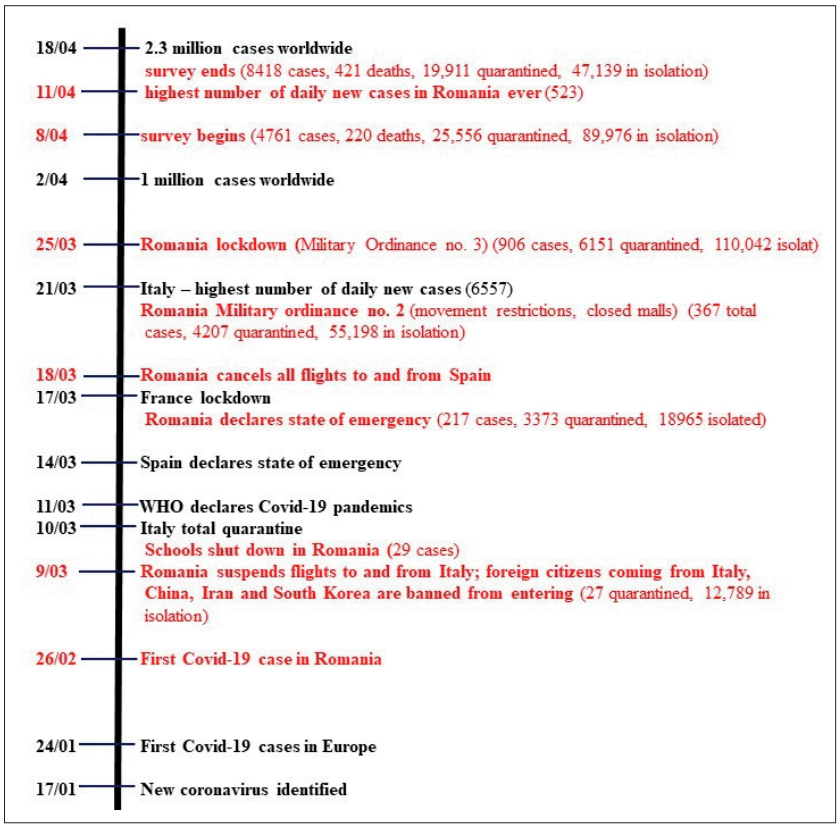

Fig. 1: Timeline of COVID-19 related events in Europe and Romania (January–April 2020)
Source: authors' elaboration

Romanian nationals that fled to their origin places from the severe situation in Italy and Spain. The countries facing the most severe situation in Europe in the spring of 2020, also host the largest communities of Romanians abroad (1.2 million Romanians in Italy and 1 million in Spain with residence permits, which makes them the largest ethnic minorities in both countries). Thus, the number of quarantined persons increased considerably, and media reports presented almost daily the situation at the western border crossing points, the influx of people and, most importantly the conflicts that arose due to the enforced quarantine. Meantime, the government agreed to an exemption for several thousand Romanians, most of them from the poorer regions that were already affected by COVID-19, but who were "needed" abroad for agricultural work, to board crammed flights to Germany and other EU member states (Creţan and Light, 2020).

2. Theoretical background

Health is influenced not only by genetics and medical care, but also by social circumstances and behavioural patterns, and as difficult as it is to change individual behaviours, there is an undeniable need to do so from a medical and societal perspective (Kahan et al., 2014), all the more considering the present context of the COVID-19 pandemic. For the last decades, organisations, researchers and professionals throughout the world have been increasingly interested in behavioural change, many of them focusing on health behaviours, since many problematic behavioural patterns may be automatic or habitual in particular contexts, so changing the context may be crucial to changing the behaviour, while changes in the physical, commercial and social environment can prompt widespread behavioural change without attempts to persuade or change individuals (Abraham and Denford, 2017).

One of the classic models of intervention for behavioural change is the "antecedent-behaviour-consequence" (A-B-C) model, which emphasises causal relationships between the three elements, according to which, in order to change behaviours, interventions are possible on the antecedents (that precede a specified behaviour and serve as triggers for that particular behaviour) and consequences (follow a behaviour and serve as a reinforcement, which increases or maintains the behaviour) (Osborn et al., 2014). Using mathematic modelling to study a disease break out in a human population, Funk et al. (2009) found that changes in behaviour can alter the progression of the infectious agent, which in a well-mixed population can result in a reduced size of the outbreak. This is also in line with the results obtained by other researchers, specifically that spontaneous behavioural changes (if the perceived risk associated with an epidemic is sufficiently large) which are fast enough, can have a remarkable effect in reducing the daily prevalence of infection and the final epidemic size (Poletti et al., 2012).

The capability to undertake personal protective behaviours requires people to understand what needs to be done, under what precise circumstances it needs to be done, how to do it and why it is important (West et al., 2020). In this situation, that is why the messages of policy makers and leaders during the various stages of the pandemic is most effective when they:

i. Emphasize benefits to the recipient;
ii. Focus on protecting others;
iii. Align with the recipient's moral values;
iv. Appeal to social consensus or scientific norms; and/or
v. Highlight the prospect of social group approval, and thus tend to be persuasive (Bavel et al., 2020).

People are essentially rational actors working on a "stage" based largely on their perceptions; however, even if these perceptions toward a particular health outcome are not to be neglected, the specific perceptions regarding the severity of the outcome or perceived susceptibility are paramount. According to "value-expectancy" models, which are focused on decision making and cognitive processes, perceptions can be modified by health promoting activities. Increased relevant information leads to improved behavioural skills, which, in turn, may promote increased odds of actually performing the behaviour. Sometimes, no skill is needed and behaviour is dependent mainly on information and motivation (DiClemente et al., 2013).

On the eve of the current epidemic outbreak, Taylor (2019) argued that during the next pandemic, many people would become fearful, some intensely so, such that the psychological effects of the next pandemic would likely be more pronounced, more widespread and longer-lasting than the purely somatic effects of infection. Indeed, people around the world have been responding strongly to the COVID-19 pandemic in terms of preventative behaviours and beliefs (mainly that taking health precautions is effective, voluntary compliance behaviours and prioritising one's health) as documented by an accumulation of qualitative and quantitative research (Clark et al., 2020; Fetzer et al., 2020; Pfattheicher et al., 2020; Zajenkowski et al., 2020).

Public perceptions of risk are an important consideration in public health and risk management decision-making (Krewski et al., 2006), and an understanding of how psychological factors influence behaviours in global pandemics such as COVID-19, facilitates disease minimisation strategies. As behavioural changes and psychological perceptions of risk are often culturally specific (Wise et al., 2020), and understanding and changing health behaviour is the first step to effecting change in a positive direction (Crosby et al., 2013), more researchers recognise the value of studies focusing on risk perception across nations and across cultures.

Over the last decades, risk perception research has gained momentum and not only did it focus on the factors and predictors of risk responses, but it also shifted from dealing with a single culture, mainly American, to a cross-cultural perspective. Moreover, this last year witnessed a surge in research on understanding coronavirus disease risk perception among the public throughout the world (Atchison et al., 2020; Cori et al., 2020; Dryhurst et al., 2020; Geldsetzer, 2020; Hou et al., 2020; Kwok et al., 2020; Lohiniva et al., 2020; Manderson and Levine, 2020; Motta Zanin et al., 2020; Ruiu, 2020; Wise et al., 2020). All of these recent studies point to several general conclusions:

i. Wherever the health risk perception is high, people engage in protective behaviour;
ii. The risk can be greatly influenced by media messages and sometimes political orientation;
iii. There is a disruption of daily routines due to the epidemic; and
iv. The uncertainty and low predictability of the disease affect people's emotions, cognition and behaviours.

Building on these notions – the psychological motivations related to behaviour, risk perception and behavioural responses in an epidemic – the present study aims to document public perceptions of risk in Romania and to investigate psychological and social factors related to risk perceptions and behaviours, as well as the attitudes toward quarantine and physical distancing during the early stages of the COVID-19 pandemic.

Since the experience of Romania regarding a thorough procedure for massive quarantine and measures to prevent the community spread of contagious diseases, does not rival that of Western states, and the country did not face any real international epidemic threat[2] during the last decades, there are significant differences in the timing and motivation of preventive measures, the economic context and the cultural and political milieux.

3. Data and methods

3.1 Survey design

We used an open-source online survey application to develop a 'risk perception-knowledge-behavioural implication' questionnaire for online use. Core questions were developed using the Health Belief Model (HBM), which has been used continuously in the development of behaviour change interventions for 40 years (Jones et al., 2014), and which is one of the most popular frameworks for explaining various health behaviours (Sulat et al., 2018), including people's behaviours and reactions regarding COVID-19 (Clark et al., 2020). We prepared a draft that was reviewed by a panel of experts to determine face validity, then pretested the instrument with fifteen respondents with various educational backgrounds, age and health conditions, who were questioned on length, item comprehensibility and relevance, to ensure that the study objectives were being met. Participant comments were largely positive regarding presentation and ease of completion, but to a lesser extent regarding the time taken to complete it. The survey was described as a research project about risk perceptions of COVID-19 carried out by researchers from the University of Craiova; hence, the questionnaire was posted on the web page of the university Geography Department, distributed and shared online using social media. A few social media influencers located in various regions of the country helped us to raise awareness about this study, particularly in three focus areas, where the research was advertised more: Suceava (as it was the first national hotspot declared due to the large number of infections among doctors and the population); Bucharest (the capital city and the second place in number of cases); and Oltenia (which was among the regions with a low number of cases). For purposes of comparison, the research also covered all other regions in Romania, as much as possible. As the questionnaire was publicly available, everyone had access to it. The data were collected from the 8th to the 18th of April, i.e. during the third and partially fourth week of country lockdown. All questions were mandatory. Within this time frame, the number of COVID-19 infections worldwide grew from 1.5 million cases to almost 2.3 million, and deaths surpassed 160,000, while in Romania the number of cases

[2] There were no cases of SARS, MERS or Ebola in Romania, and the media only briefly mentioned the outbreak of the epidemics worldwide. The most severe infectious diseases in the history of the country that affected the population was typhus, which happened more than 100 years ago.

almost doubled (08.04.2020: 4,761 confirmed cases, 261 deaths; 18.04.2020: 8,418 confirmed cases, 469 deaths (source: www.datelazi.ro; www.covid19.geo-spatial.org).

3.2 Participants

There were 734 persons, 18 to 88 years of age, who completed the online questionnaire and who were not infected by COVID-19, as far as they were aware. Respondents came from all over the country (every region is covered), with a higher concentration in the South-Western Development Region (which had the lowest number of infections), the northern part of the country – mainly Suceava (with the highest number of cases by far), and Bucharest, the capital city. In each county and region, participants were invited to respond by means of social and mass media (Marsden and Wright, 2010). After data cleansing, 716 respondents remained in the data set, 245 men and 471 women. Most (86%) respondents lived in urban areas, with 14% from rural areas. Also, seven out of ten (70%) declared to have higher education, the rest (19%) having some form of intermediate education.

3.3 Survey content

Section 1 of the instrument focussed on risk perception using the core HBM measures, consisting of Likert scale items assessing perceived susceptibility (asking respondents about the sensed likelihood of being infected with Covid-19, considering the government's measures), ascertained severity (awareness of symptoms if they would be infected with COVID-19), realised/noticed benefits, barriers and self-efficacy. In Section 2, knowledge about COVID-19 was assessed regarding five potential transmission routes, with response options being true, false and I don't know. Respondents were also asked to rate the information about COVID-19 epidemics presented by media, social media and authorities. To assess behavioural implications, in section 3 respondents expressed agreement or disagreement with 21 statements addressing the causes for a different behaviour, behaviour changes, consequences, induced stress, as well as three questions focusing on emergency food preparedness. The last section consisted of six items concerning demographic information.

3.4 Data analysis and representation

Before analysis of the survey data, additional processing was needed (Fowler, 2013). All responses were saved in a Comma Separated Values (CSV) file and before the analysis of data, we ran a script in Jupyter notebook for primary processing and data visualisation of the survey results. For statistical analysis, R functions and packages were used, all computations being performed in RStudio Cloud. Raw data was standardised by calculating the coefficient of variation and z-scores and by examining their values (Sauro, 2010).

Survey data and GIS were linked using spatial analysis with georeferenced data. GIS methods were used as a visualisation tool to depict spatial relationships (concentration of responses; evolution of cases and deaths; location of persons in urban or rural settlements). Moreover, survey data is better explained by using visual displays. Mapping spatial coverage of responses across the country was provided by geocoding, namely linking the individual-level survey data to the specific location on the map that corresponds with the name and location of the settlement provided by each respondent (see Fig. 2).

Statistical data about confirmed cases and deaths were taken from governmental sites (www.mai.gov.ro) and other open-source sites that present trends in the statistics from the mentioned official sources (www.covid19.geo-spatial.org; www.datelazi.ro).

As noted above, 734 questionnaires were completed on-line, out of which 716 were validated. With a response rate of 97.54% and a confidence level of 95%, the confidence interval calculated was ± 3.62%. For the relevance of the study at national level, the authors tried to cover all regions, with respondents coming from 150 urban and rural settlements, excepting Tulcea and Covasna counties, where no case of Coronavirus had been confirmed by the end of the study.

The spatial distribution of responses (Fig. 3) indicate high levels of contraction in three regions: Oltenia, Suceava and Bucharest. As a result of the high concentration of responses and the different characteristics of the three regions, the three areas were selected in conducting a comparative analysis regarding risk perceptions (see Tab. 1).

The following criteria were also considered: (i) the region with the smallest number of confirmed cases and a subsequent slow evolution of the epidemic (Oltenia); this region also had the first confirmed case of COVID-19 in Romania, registered in Bâlteni (Gorj county) on 26th of February 2020, and the first death caused by the COVID-19, declared in Craiova (Dolj county) on the 22nd of March 2020. Both patients were males. The other regions were selected because (ii) Suceava county was declared the hot spot of the pandemic, while Bucharest is the largest city (2.1 million inhabitants and the capital of the country) and (iii) was the second area regarding confirmed cases of Coronavirus. The

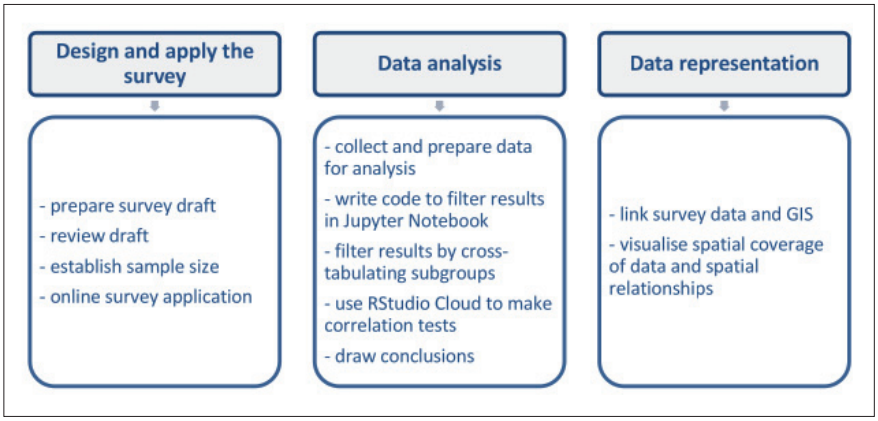

Fig: 2: Workflow of the research
Source: authors' elaboration

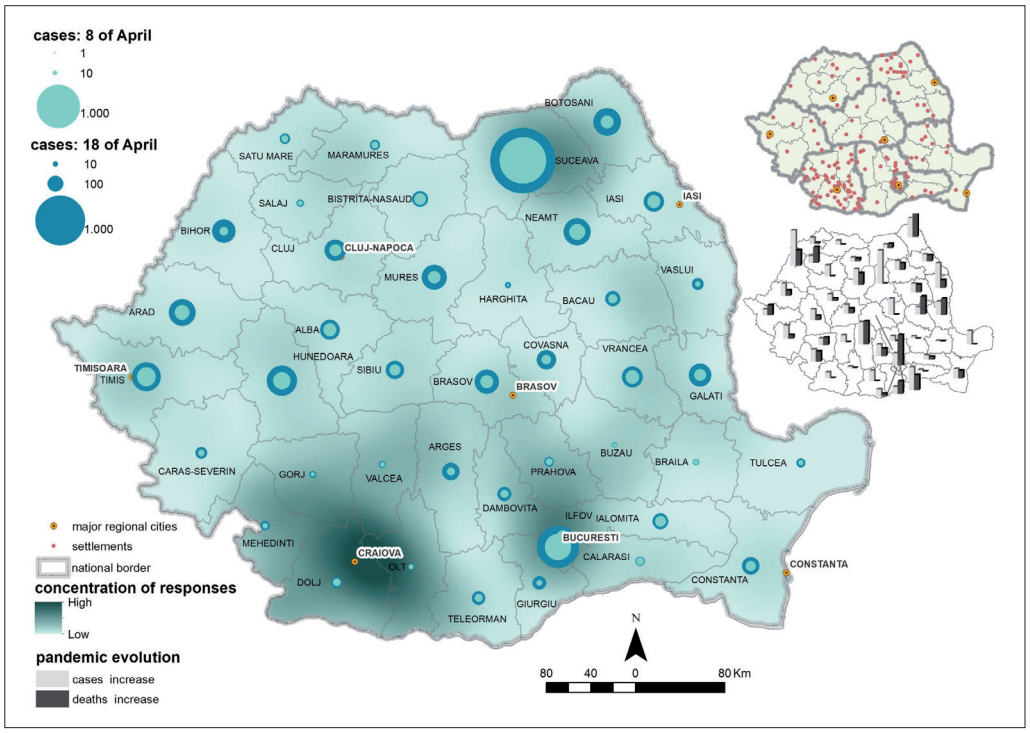

Fig. 3: Case evolution during 8–18 April, 2020, and location of respondents
Source: authors' elaboration

Region		Romania	Oltenia	Suceava county	Bucharest city
Population	Total	19,317,984	1,909,752	622,533	1,832,883
	%		9.88	3.22	9.48
Area km^2	Total	238.390,71	2,921,169	855,350	23,787
	%		12.25	2.92	0.09
Number of cases	Total	8,418	72	663	378
	%		0.85	7.87	4.49
Number of responses	Total	716	329	58	121
	%		45.94	8.10	16.89
COVID-19 incidence (18.04.2020)	No of cases/1,000 inhabitants	0.38	0.06	2.64	0.45
Health infrastructure	No of doctors/10,000 inhabitants	28.5	28.2	12.4	65.6
	Hospital bedplaces/10,000 inhabitants	60.4	60.2	39.9	103
GDP/capita	€/capita*	9,122	6,788	5,729	21,145

*Tab. 1: Basic characteristics of the three analysed areas (Note: * data refer to the Development regions)*
Source: authors' calculation using statistical data from the National Institute of Statistics

three selected regions concentrate 80% of the responses from persons located in 76 settlements (about 51% of those covered by the study).

4. Results

The questions concentrating on the determination of the risk perception were included in the first section of the questionnaire (Couper et al., 2019). The participants were asked first about perceived susceptibility and severity (see Tab. 2). We found that risk perceptions of COVID-19 are relatively high among the population (more than one third were concerned, 22% of respondents were very concerned about the national situation, and just 8% declared they were not worried). The analysis of the results shows that women tend to be more worried about the current situation (62.8%), than men do (49.7%); however, regarding the severity, almost all men (95.1%) believe that in case of an infection their state would be severe. By cross-referencing the responses with the degree of education, we found that people with higher education tend to be more concerned about the situation (60.8%), than those with intermediate education (47.1%). As closed-ended rating scale data are easy to summarise, but hard to interpret, we compared the responses to a benchmark used to compute the z-score values.

Z-scores values calculated are negative, indicating that they fall below the mean (Tab. 3). The most distanced values from the mean in standard deviation (SD) units are those registered for the stress induced by the restrictions imposed

during the quarantine period (– 40.7672). Other high values below the mean for the z-scores have been calculated for behavioural changes (– 31.7679), increased measured taken to prevent infection (– 14.3192), and for the three most common transmission routes (direct contact with an infected person – 18.5771; air borne – 17.7374; contaminated surfaces – 15.6194).

Although the standard deviation is commonly used to express variability, it is difficult to interpret its values, especially in this case, when a mixed scale of points is being used. Therefore, the authors used, in addition, the coefficient of variation to identify more easily the values that indicate a higher variability, as in the case of concerns of being infected (84.49%) and impulsive shopping (83.27%). The highest value

Characteristics	Perceived susceptibility/ Worried of being infected		Confidence that they can protect themselves against infection	Perceived severity/Severe state in case of infection
	YES	NO		
Women	62.8%	36.7%	52.6%	84.5%
Men	49.7%	50.2%	23.3%	95.1%
urban	59.0%	41.0%	49.2%	19.8%
rural	58.0%	42.0%	54.7%	23.1%
intermediate education	47.1%	52.9%	57.2%	18.8%
higher education	60.8%	39.2%	48.3%	20.4%
Bucharest	62.0%	38.0%	39.6%	23.9%
Suceava county	60.0%	40.0%	37.9%	25.8%
Oltenia region	57.0%	43.0%	53.3%	18.1%
Total	**59.0%**	**41.0%**	**50.0%**	**20.0%**

*Tab. 2: Percent of perceived susceptibility/severity (Note: *calculations resulted after processing survey data)*
Source: authors' calculation based on the survey data

Risk perception	SD	mean	coefficient of variation (%)	Z-score
Perceived susceptibility/Worried of being infected	0.4933	0.5838	84.49	– 6.9256
Confidence that they can protect themselves against infection	0.9896	3.4372	28.79	– 0.5688
Perceived severity/Severe state in case of infection	1.0869	2.7123	40.07	– 1.1847
Concern about the infection of a:				
family member	1.0376	2.7514	37.71	– 1.2034
friend	0.9785	2.7622	35.42	– 1.2650
Knowledge about COVID-19				
Transmission routes:				
direct contact with an infected person	0.1630	0.9727	16.75	– 18.5771
air borne, if someone infected coughs/sneezes	0.1708	0.9700	17.61	– 17.7374
contaminated surfaces	0.1946	0.9606	20.26	– 15.6194
water	0.3991	0.3991	201.33	– 9.5255
contaminated aliments	0.4756	0.4756	72.55	– 7.0313
Confidence in the utility of information transmitted by:				
mass-media	1.1542	3.1369	36.80	– 0.7478
social media	1.1950	2.8979	41.24	– 0.9223
authorities	1.1093	3.8042	29.16	– 0.1765
Behavioural implications				
Measures taken to prevent infection	0.2128	0.9525	22.34	– 14.3192
Behavioural changes	0.0982	0.8818	11.13	– 31.7679
Stress generated by the pandemic	0.0894	0.3549	25.19	– 40.7672
Impulsive shopping	0.4989	0.5992	83.27	– 6.8168

Tab. 3: Coefficient of variation for level of risk perception, knowledge about COVID-19 and behavioural change for sampled Romanian population
Source: authors' calculation based on the survey data

of the coefficient of variation (201.33%) was calculated for the responses given when participants were asked if they considered water as a transmission route. Responses with similar means but with noticeably different coefficients of variation indicate that the respondents have inconsistent attitudes, as in the case of behavioural changes declared (mean = 0.9525 and coefficient of variation of 22.34%) and measures taken to prevent infection (0.8818 and coefficient of variation 11.13%). An extreme difference in the value of the coefficient of variation (201.33% and 72.55%) was noted for the close mean values calculated for two of the transmission routes: water (0.3991) and contaminated aliments (0.4756).

For further analysis, from our entire data, we created a dataset composed of socio-demographic variables and variables regarding the degree of concern and belief about one's own health condition in case of infection. Using RStudio, we calculated a correlation matrix between five variables to examine the level of correlation between sociodemographic features (age, sex, living environment and education) and the level of concern regarding the possibility to become infected (see Fig. 4). A correlation was also computed with a person's belief regarding the severity of the state it may develop, using Spearman's rank correlation (Rübsamen et al., 2015).

The correlation matrix shows that the highest positive correlation (0.25) of risk perception is with age and education, while a negative correlation is with sex (– 0.21). But a correlation coefficient different from 0 does not mean that the correlation is significantly different from a null value. This needs to be tested with a correlation test. Using the *rcorr()* function in R from the Hmisc package applied to our dataset, we computed the p-values of the correlation test for several pairs of variables at the same time (Tab. 4).

P-values smaller than the significance level ($\alpha = 0.05$) indicate that there is a strong correlation between sex (0.001) and the level of concern regarding the risk to get infected, while age is not correlated with the concern about the situation (0.205). As for one's belief to be in a critical shape in case of an infection, we find a strong correlation with age (0.0001), but not with the sex variable (0.538). To obtain more information for the associations between sociodemographic factors and risk perceptions about COVID-19 manifested by the participants in the study, we used the *correlation()* function from the easystats correlation package to combine correlation coefficients and correlation tests (see Fig. 5). The correlogram adapted from the *corrplot()* function represents a more concise overview of correlations between all possible pairs of variables present in a dataset with intense colours for high correlations, while the correlations not significantly different from 0 are represented by a white box.

5. Discussion

This research assesses risk perceptions determined for the Romanian population in regard to the current Covid-19 pandemic. The preliminary results indicate that, although people are aware of the infection risk, they tend to see their

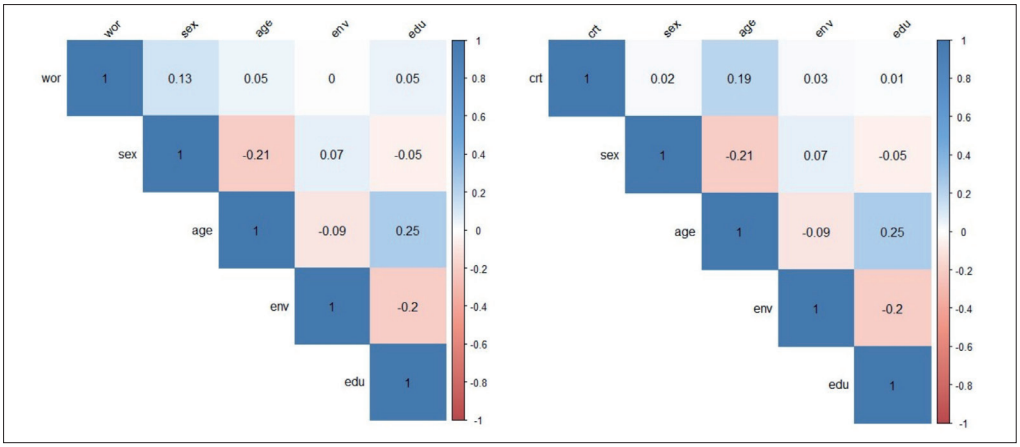

Fig. 4: Correlation between perceived risk (left) and critical state (right)
Source: authors' calculation based on the survey data

	wor	crt	sex	age	env	edu
wor	NA	0.000	0.001	0.205	0.918	0.149
crt	0.000	NA	0.538	0.000	0.458	0.788
sex	0.001	0.538	NA	0.000	0.082	0.179
age	0.205	0.000	0.000	NA	0.013	0.000
env	0.918	0.458	0.082	0.013	NA	0.000
edu	0.149	0.788	0.179	0.000	0.000	NA

Tab. 4: Correlation matrix for dataset containing several pairs of variables
Source: authors' calculation based on the survey data
(Legend: wor = level of concern regarding the risk of getting infected, crt = ones belief to be in a critical shape in case of an infection, env = urban or rural environment, edu = level of education)

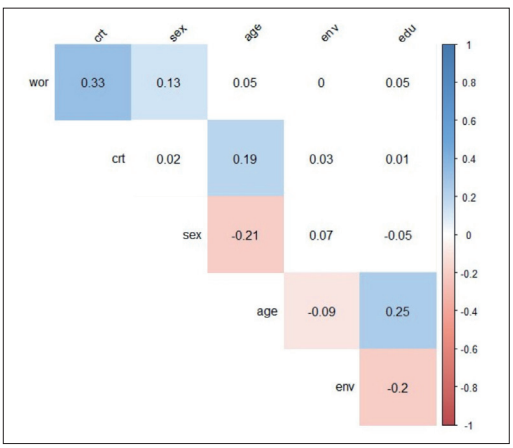

Fig. 5: View of correlation coefficients
Source: authors' calculation based on the survey data

friends at a greater risk compared to a family member and mostly themselves, which is a typical instance of optimism bias (Sharot, 2011).

Interestingly, among the predictors of risk perception, trust in government was very significant. The majority of the participants (54%) trusted the measures taken by the authorities, unlike other nations (Fetzer et al., 2020), but manifested a lower confidence in the capacity and preparation of the medical staff to manage the current situation (69%). The current mistrust of the population in the professionalism of the medical staff can be explained by the general lack of confidence in the outdated Romanian medical system (Haivas, 2010; Popa et al., 2017; Scintee and Vlădescu, 2006; Spiru et al., 2011). This was exacerbated by the present situation when faulty management caused the infection of a high number of medical personnel, which subsequently passed the virus to their patients (68% of the respondents declared that visits to a doctor have an increased level of infection risk). Authorities declared Suceava a red zone because of the high number of cases registered, many of them being among doctors.[3]

Given the fact that a large number of questionnaires were concentrated in three areas (Oltenia, Bucharest and Suceava), the authors paid additional attention to these regions to see if there are any variations as compared to national general values, or between them. It must be noted that respondents from Suceava, the county with the highest incidence by far at that time (2.64 cases/1,000 inhabitants compared to only 0.38 in Romania: Tab. 1), and one with the poorest medical system in the country, ranking among the last counties with regard to the number of doctors/10,000 inhabitants, number of hospitals and hospital beds, not to mention the media coverage of the protocol breaking by the medical personnel in the county, did not see themselves as facing a much greater risk of being infected as compared to other people living in other parts of the country. Interestingly, the highest perceived susceptibility was claimed by people living in Bucharest, the capital city, having the best medical infrastructure in the country and better access to health care, despite a low incidence of COVID-19 cases. It is a kind of paradox.

The analysis of the results coming from the three areas showed a slightly different situation in the case of peoples' confidence in their own protection capabilities. For example, more than one half of the people residing in Oltenia region (53.3%), the region with the smallest number of cases (hence the lowest incidence: 0.06 cases/1,000 inhabitants at the end of the survey period), are more confident that they can protect themselves against a possible infection, than those living in Bucharest city (39.6%) or Suceava county (37.9%), which represented the red zones of the country at the time of the study. Also, 18.1% of the respondents located in Oltenia believe that they might be in a severe state in the case of an infection. This proportion slightly increases in the case of Suceava (25.8%) or Bucharest (23.9%). Although most of the people considered the information released by the authorities as useful and trust in the measures taken by the government, only 39% believe that the general public respected the legal provisions.

Public transport and shopping (68%) were the most frequent responses to questions concerning the infection risk in different situations, followed by public places (65%), and visits to a doctor (62%). As expected, people in Suceava and Bucharest perceived a much higher risk of being infected following a visit to the doctor (85% and 73%, respectively), compared to those in Oltenia (only 55%). As a matter of fact, a visit to the doctor ranks highest among the places where one could get infected, according to the responses provided by residents in Suceava and second for those living in Bucharest, no matter the gender or education level. Also, 74% of the participants manifested their concern generated by the large number of persons returning from countries strongly affected by the Coronavirus pandemic. All three focus areas scored higher values than average, with Bucharest ranking first (89%), while both Suceava and Oltenia are closer to the average, despite being important emigration areas for temporary low-skilled workers.

In Section 2 of the questionnaire, the authors intended to rate the knowledge levels of people about COVID-19 in terms of transmission routes and possible places where one could be infected. Participants were also asked to say if they considered useful the information presented by mass media, social media and authorities, and if they obtained additional information from other official or international sources. To analyse the relations between the responses, correlations were carried out between the degree of education of the respondents, their stated knowledge about the virus and the confidence in the sources of information.

Regardless of their education, most of the respondents correctly indicated the transmission routes of the virus as per the information and studies available at the respective moment (CDC, 2020; Morawska et al., 2020; Peng et al., 2020; Zhang et al., 2020). So, over 90% mentioned as sources of infection the direct contact with contaminated surfaces or infected persons or transmitted through the air exhaled by an infected person when coughing or sneezing. Only half of the respondents considered that the virus can be spread by water or goods imported from affected countries. Regarding the importance of the information publicly transmitted, a majority of the respondents (no matter of their level of education) incline to trust more the information shared by the authorities (about 65%), while mass media and social media have almost equal shares (see Fig. 6).

The assessment of behavioural changes was quantified by processing the responses expressed by participants as an agreement or disagreement to 21 statements addressing the causes for a different behaviour, behaviour changes, consequences, induced stress and emergency food preparedness. The analysis of the processed data indicated that most of the participants had similar attitudes toward specific measures taken to prevent the spread of Coronavirus (over 95%), the same as their friends (56%) and employers (70%).

Quite interestingly, most of the respondents adopted preventive behaviour and were willing to self-isolate mainly for the protection of the family/friends and colleagues, and to a lesser extent to reduce the risk of self-infection, while the threat of sanctions was deemed the least important.

[3] The number of infected medical personnel throughout the country grew rapidly, peaking at 1,031 persons on April 18th, accounting for 12% of the infections at that time, almost half of the cases being registered in Suceava and a significant number in the capital city. Moreover, several days before the survey started, there was a massive media coverage of the situation from Suceava, where the government sent a military doctor to run the hospital, as well as from Arad County Hospital, in the western part of the country, where 40 persons from the medical staff (out of which 19 were doctors) resigned and 127 applied for sick leave.

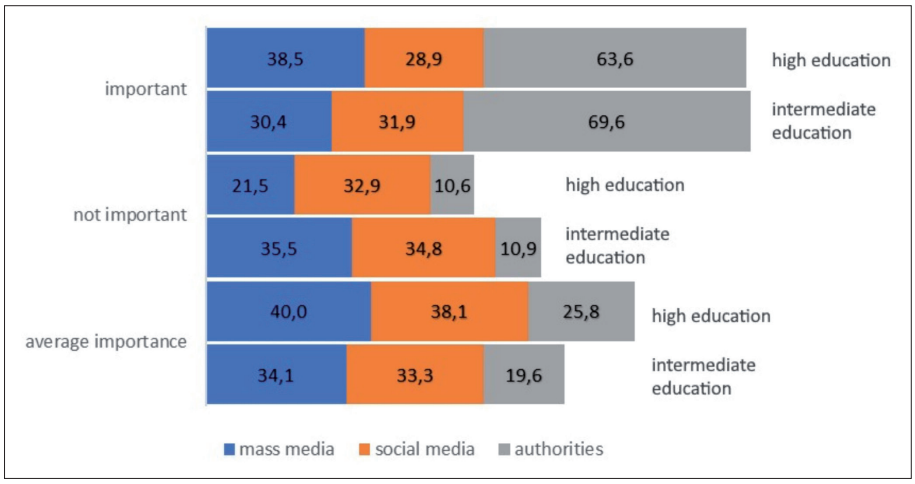

Fig. 6: Share of the people trusting in different information sources according to their education
Source: authors' calculation based on the survey data

The participants declared they have changed their normal behaviour when it comes to meeting with friends and other family members (94.5%), reasons to get out of the house (93.2%), keeping the recommended distance (92.5%), avoiding persons returned from red zones (97.6%) and crowded places (88.8%), but more than half of them (56.8%) stated that they did not make food stocks. The changes also occurred in terms of a stricter hygiene and use of disinfectants (89.3%).

Although a majority of the respondents in this study declared they felt an increased stress during the lockdown because of their family (69.9%) and for financial reasons (59.2%), most of them stated that their health was not affected. Thus, 80.4% said that did not have trouble sleeping, 87% declared that they did not increase the consumption of alcohol, as a result of stress, and only 35% of the participants felt more nervous than usual. Women also reported being more stressed than men.

Although risk perceptions differ considerably among social and cultural groups, the results of our study are in accordance with those of researchers around the world, mainly showing that: (i) women perceive a higher risk than men do (Atchison et al., 2020; Szabo et al., 2020); and (ii) risk perception correlates positively and significantly with preventive behaviour (Atchison et al., 2020; Clark et al., 2020; Dryhurst et al., 2020; Harper et al., 2020; Hou et al., 2020; Kwok et al., 2020; Pfattheicher et al., 2020; Wise et al., 2020; Zajenkowski et al., 2020).

As a result, Romanians concerned about COVID-19 quickly adopted public-health compliant behaviours, just as other nations (Harper et al., 2020). Overall, these results suggest that currently, the higher the perceived risk, the higher the compliance with preventive measures and behavioural change. Consequently, in times of health crisis, authorities should consider strategies that target raising awareness regarding the need for preventive behaviour, as well as on the efficacy of health behaviour in pandemics. It should be noted once more, however, that people living in areas with higher COVID-19 incidence and high infection rates of the medical staff (at least during the first wave of the epidemics) avoid paying a visit to the doctor for fear they may get infected, not to mention that they believe that the medical staff lack the capacity and preparation to manage the current situation. This may partly explain why, beginning in July, following the decision of the Constitutional Court, COVID-19 patients with no or mild symptoms could no longer be hospitalized against their will. Consequently, increasingly more persons that tested positive have discharged themselves from hospital, despite still being sick and going home, thus increasing the risk of infecting their family members and friends.

The lack of trust in the medical system and medical care avoidance should be a wake-up call for the government and health officials alike, which should seek to understand behavioural responses as they provide valuable insight into the processes of decision-making surrounding avoidance. The results of this study might also be used to inform intervention development, which is critical to extending the reach and effectiveness of patient care.

Limitations

There are several limitations to our work.

Due to the online approach, which was the single feasible means of collecting data during the epidemic, people lacking internet access, mainly from the rural areas and the oldest age groups, might be under-represented. Furthermore, the education level of the participants was also higher than that of the general population (70% had a bachelor's degree, compared to only 14% of the national average for Romania), and the median age of the respondents is relatively young (48% are in the rage of 18 to 34 years). Younger people, however, are typically the primary target of efforts to encourage physical distancing (Wise et al., 2020).

The use of a spatial statistical methods to measure variability has its limitations (Netrdová and Nosek, 2017), as the standard deviation quantifies only absolute levels, therefore the authors used in their study the coefficient of variation. Also, correlations were made between variables like age, education, living environment to establish the level of risk perception (Husnayain et al., 2019; Komperda, 2017).

The analysis of responses from three different heterogenous areas revealed that despite their differences in social and economic areas, or the extent in the covered area, the results were quite similar compared those reflected by the rest of the respondents coming from other parts of the country. The conclusion was that risk perceptions of COVID-19 are relatively high among the population, no matter the region they are located in. The reported risk perceptions and attitudes are conditional for the situation in Romania as of April 2020.

6. Conclusions

Against the background of a rapidly evolving pandemic, the Romanian government took what might appear to be drastic preventive measures at a very early stage, by closing schools and universities, then public places, restricting movement and urging people to work from home when possible. Authorities aimed to avoid a peak in COVID-19 cases that would exceed hospital capacity, one of the main reasons for increasing these preventive measures being the rapidly growing and mobile diaspora that decided to return home, following the severe situation in Italy and Spain, the worst affected countries at that time.

Public perceptions of risk can change with the passage of time and the unfolding of new events (Krewski et al., 2006). The statistical analysis of data indicated an average level of concern, as only 56% of the participants stated that they feel worried about the situation in Romania at the time of the survey, with a similar proportion (58%) for the acknowledged possibility of being infected. The study did not indicate a link between the number of cases registered in one county and a high level of public perception risk. So, at the national level, as well as in all three selected areas, there were no major differences regarding the level of population concern or fear manifested toward the risk of being infected. Despite the fear of getting infected, expressed by 58% of the respondents, half of the participants claimed that they trusted their own measures of protection taken against a possible infection, with women showing a higher degree of confidence (35% as compared to only 15% of men).

We found that risk perceptions correlated positively and significantly with preventive health behaviour, such as hygiene practices, physical distancing and travel avoidance. Among the psychological predictors, personal knowledge, the social amplification (frequent information about COVID-19), trust in government and personal efficacy, rank as the most important factors for Romanians' risk perception.

This survey provides useful insights on how the public perceived the health-risk associated with the COVID-19 pandemic, which was considerably influenced by risk communication transparency by government and official health agencies. The degree people understand this threat and media coverage point to timely and consistent behavioural responses of the community, in compliance with the national strategies for the control of the crisis.

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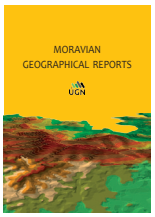

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Vulnerable Roma communities in times of the Covid-19 negative quarantine

Cătălin BERESCU [a], Filip ALEXANDRESCU [a], Ionuţ Marian ANGHEL [a *]

Abstract

In contrast to other countries in East Central Europe, Romania stands out because of a high number of small and segregated Roma settlements. As an ethnic minority, the Roma are overrepresented in marginalised and impoverished settlements and, given the basic recommendations to contain the pandemic – wash hands, keep the distance and work from home, their situation was disproportionately exacerbated by the imposition of lockdown measures. We use secondary data to interpret the deprivation features that puts them at greater epidemic risk. In addition, the Covid-19 crisis led to a sudden return of the Romanian Roma living in Western Europe. The slums and ghettos were more strictly quarantined than regular areas, suggesting a form of negative quarantine. Quarantine was – next to its medical purpose – used as a rhetoric and disciplinary device. Roma were portrayed as infection spreaders, and racism was channelled mainly through the media. While the spread of the disease placed them at risk, the lockdown itself induced major survival challenges. By using media and social media analysis, we show how the discourse of negative quarantine unfolded. The latter was diluted in the general relaxation of containment measures, but its legacy as a practice raises questions for the future governance of areas inhabited by the Roma.

Keywords: *Roma, ghetto, Covid-19, negative quarantine, racism, Romania*

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1. Introduction

In a Facebook post entitled ”An unsafe Romania” and dated April 22, 2020, five weeks after the beginning of the lockdown in Romania, the former mayor of Târgu Mureş, a mid-sized Transylvanian city, wrote that he felt rage against the feebleness of police forces who “simply watch as certain social categories refuse to obey the measures against the spread of the coronavirus”. In a previous post, entitled ”The birth of a child should be a great responsibility in a civilised state”, he clarified which “social categories” he had in mind: “the Gypsies are a serious problem for Romania”, especially those that “come from socially deprived areas, which are completely out of control”. In a few short sentences the mayor, who had already been fined before by The National Council for Combating Discrimination (NCCD), portrayed the Roma settlements as hotbeds of the spread of Sars-Cov-2, even before the first case of Covid-19 was recorded in Romania and two months before the state of emergency was declared.

The return of the Roma migrants proved to be as equally troublesome as their “irregular” mobility towards the West (Anghel, 2019), not just in Romania, but also in other Central and Eastern European countries (e.g. Slovakia and Bulgaria). During the first four months of the pandemic, the Roma have repeatedly been constructed as vectors of spreading the disease among the majority population. Special measures to contain mostly larger Roma neighbourhoods were taken in Romania and Bulgaria, where entire streets were patrolled by police cars and special checkpoints, or makeshift walls were installed in order to prevent people from leaving (Bulgarian Institute for Legal Initiatives, 2020, EURACTIV, 2020b). A senior member of a coalition government party in Bulgaria has urged the government to “close the ghettos everywhere”, while the Interior Minister justified the additional measures because: “we are obliged to protect the rest of the population” (Krasimirov and Tsolova, 2020). In Romania, several Roma neighbourhoods were quarantined and patrolled by police and military forces after some residents tested positive.

Slovakia’s Prime Minister, Igor Matovič, announced at the beginning of April 2020 that the government will mobilise its military doctors, backed by the army, to test 33 Roma settlements with nearly 1,500 individuals who have recently returned from abroad. The measure was justified by government experts to contain a possible spread of the

[a] Research Institute for Quality of Life, Romanian Academy of Science, Bucharest, Romania (*corresponding author: I. M. Anghel, e-mail: *ionut.anghel@iccv.ro*)

coronavirus, because of the "poor hygienic standards'' (Virostkova, 2020). Moreover, the mayor of Košice stated bluntly that the Roma can spread the coronavirus because they are "socially unadaptable people'', and thus accused of being less inclined to follow preventive measures (Tudor, 2020). Meanwhile, five Roma settlements from Eastern Slovakia, with around 6,000 people were quarantined and patrolled by police, although the then-current legislation upheld a 10% threshold for introducing a quarantine (Gabrizova, 2020). This political framing of the Roma resulted in intimidation, police brutality and sometimes in the strict quarantining of "Roma colonies" or ghettos.

Our paper addresses the imposition and logic of quarantining to show how the application of the prevailing measures of fighting Covid-19, namely – quarantining, physical distancing and curfew, with a disproportionate use of penal means, policing and discursive disciplinary devices – created the premises for a dual system of control. This dual system supervises the majority society relatively loosely while concentrating its resources towards the policing of precarious Roma ghettos.

We observed a rational adaptation of most citizens to the constraints of the lockdown, which we term "neutral" quarantine. But on the other hand, we observed a "negative"quarantine that instituted a supplementary layer of surveillance in segregated Roma ghettos. The latter has a dialectical pair in terms of a "positive" quarantine, a cultural construct of the middle class, which identifies itself as the bearer of "civilisation" and fights for the "salvation" of various public goods and values. Due to an incessant dynamic and to the slightly different nature of the categories employed in the analysis, the neutral was a state-sanctioned form of governance, while the positive and negative were mostly a set of attitudes and practices that reinforce each other, suggesting emerging forms of governance, albeit we are aware that the three forms occasionally overlap. We engaged in a comparison of negative and neutral/positive quarantine, to highlight their interrelated forms but also their consequential outcomes.

Negative quarantine overlapped with the general measures taken during the lockdown but differed in the fact that it embedded a reactivation and intensification of pre-existing racial tropes and forms of institutional control. The administrative practices of quarantining applied to Roma areas were thus likely to yield different results than those applied to the rest of the population. The ultimate aim was not the re-establishment of normalcy but the further control of a minority and of the area it inhabited on account of what appeared to be places of a new biological threat. Negative quarantine consisted at this stage of the flows of discourses, images, policies and spatial containment practices that went beyond medical interventions and were used to discipline the quarantined ethnic populations, along racialized lines. Those policies were forged in long-established practices of racialisation (Teodorescu, 2019; Vincze et al., 2019) that included evictions, administrative abandonment of settlements and discriminatory access to health, education and housing (Arpagian and Aitken, 2018). What was left unexplored in the Roma related literature was the sudden and radical deployment of a racially-charged discourse in an unprecedented medical-*cum*-economic crisis. We therefore ask how did the imposition of a (negative) quarantine affect the segregated Roma communities during the lockdown? At the outset, many Roma who did informal work in recycling, day labouring in agricultural activities, or other jobs on the grey or black market or seasonal migration, saw their meagre opportunities dwindling, leaving them with less to no income. In addition, in households with children attending pre-school or compulsory education, many children lost their only adequate daily meal.

Given these circumstances, our paper is structured around four objectives. First, we analyse the pre-existing conditions found in Roma segregated settlements before the onset of the pandemic. Second, we explore the securitisation challenges posed by the sudden return of some Roma to Romania and their discursive overtones. The third objective addresses the media representations related to Roma mobility during the state of emergency. The fourth objective is meant to advance and theorise the concept of negative quarantine as a way to draw attention to the implications of quarantining measures that are adopted in a racially charged socio-economic environment. Each objective will be addressed, in turn, in the four results subsections.

This article starts by presenting the theoretical background against which the negative quarantine concept is built. Next, we introduce the secondary and qualitative data on which we forged our analysis of some media-reflected conflicts surrounding the imposition of quarantining measures in several Romanian towns. The following two sections describe the sudden return of the Roma from Western Europe, including the challenges with which the health and local authorities were faced and the subsequent process of "making ethnic" the quarantined areas. The next section compares the features of the negative quarantine, enforced on some Roma ghettos, and the neutral quarantine applied to the rest of the population. We conclude by showing that many Roma communities have been on the losing side of quarantining policies, in particular those that relied on informal work or on work abroad. The implications of negative quarantine are nevertheless open ended and aggravating since they reverse the logic of protecting public health into a logic of social punishment in segregated areas.

2. Theoretical background: Securitisation, transnational mobility, and the threefold logic of quarantine

The EU's "big bang" enlargement over a decade and a half ago has been considered a "security moment" (Goldstein, 2010, p. 487) regarding Roma mobility towards Western Europe. As many scholars have already argued (Balch, Balabanova and Trandafoiu, 2014; Hepworth, 2012; Sardelić, 2017), processes and practices of securitisation, "nomadisation" and criminalisation have characterised Roma westward mobility since 2004–2007 and have also legitimated contestable measures of dismantling Roma camps.

The EU-extension eastwards posed a large – yet anticipated – migration concern of impoverished Eastern Europeans towards the West. As a result, EU member states targetted this pauperised group (consisting disproportionately of Roma) with various securitisation techniques that are normally intended for non-EU migrants (van Baar, 2014). Within the ongoing process of securitisation of CEE Roma in the West, we theorise the securitisation of the opposite movement – of their return as potential "infectious super-spreaders" (van Baar, Ivasiuc and Kreide, 2019; Vrăbiescu, 2020).The restrictions of movement imposed by the Covid-19 pandemic in early 2020 have reactivated concerns with the excessive mobility of the Roma (Creţan and Light, 2020), this time articulated as

prejudice against the infectious Other. This took the form of two interrelated processes that were thrust into prominence between March and May 2020. First was the swift reaction to the return of Roma migrants from Western Europe, which took the form of a crackdown against "undisciplined Roma" and the rapid imposition of local quarantines throughout Central and Eastern Europe (CEE). This created a new layer of hardships for segregated Roma groups, who used open spaces and connections to places beyond the ghetto to secure their survival (Málovics et al., 2019). The second process made visible the deeper logic of the early crackdown. The imposed quarantine was not meant as a temporary measure to protect all citizens against the spread of Covid-19 but rather as a one-sided device, similar to the *cordon sanitaires* in French-dominated Rabat (Picker, 2017). In other words, the quarantine was an attempt to "gut the ghetto". To summarise, the pandemic has been used by national authorities in CEE to temporarily raise the securitisation bar to a new level by introducing the negative quarantine as a form of bio-securitisation.

In its current meaning, the quarantine has a limited term during which the mobility and exchange of goods or services of an individual or group is restricted to prevent the spreading of a disease. Its practice has to comply with the general human rights framework and can only be limited in time. Baldacchino (2021, p. 1), however, argues that: "today, as in the past, these practices operate [in terms of] race, gender and citizenship, shielding some while exposing others to risk and even death". On the other hand, Simpson (2021) pinpoints to an emerging "prefigurative pandemic politics", which produces a racial colonial quarantine. Reflecting this background, we advance a theoretical distinction between positive, neutral, and negative quarantine regimes. In this article, we build on the streams of literature presented above by conceptualising the negative quarantine. This form refers, as we argue here, to a set of attitudes and policies that converge into the idea that the state should, under exceptional circumstances, exceed the legal framework and instantiate a form of ethno-racial control over Roma settlements.

The term "negative quarantine" is used here to describe the racialisation of the epidemic, to observe the changes in the governance of the ghetto and to reveal its institutional nature. Negative quarantine enables a distinct spatialisation of racism. It is the more or less arbitrary imposition of a state of quarantine without concern for the ability of the locked-up community and its members to actually survive during this time. The negative quarantine is not finalised by a restoration of normalcy but by a more or less harsh accentuation of extreme conditions that existed before the quarantine. It makes visible the outer shell of the community and makes invisible the innards of the quarantined place since the problem of their survival becomes one of individual struggle. Extending Wacquant's (2012) account of the institutional nature of the ghetto, the negative quarantine is thus a process that lays bare the relationships between a state that uses the pandemic to reinforce marginality and a racialised group whose vulnerabilities are exploited in a crisis situation.

While at the very beginning of the Covid-19 pandemic, the virus likely spread with comparable speed in Roma and non-Roma communities, it is only that the former were subject to over-policing, and the breaking of quarantining rules resulted in heavy punishment and large fines. The "ethnicisation of the pandemic" (Berta, 2020; Costache, 2020) was based on and reinforced by the racist tropes that portray the Roma as a gregarious, indivisible community, undisciplined and potentially violent. A "negative quarantine" is thus a way to keep under control a group that appears to exhibit unacceptable behaviours. Its counterpart, the "positive quarantine", is manifested through a display of willpower of a moral subject unaware of its privilege and proud of his or her capacity for self-discipline. Both attitudes gravitate around the "neutral quarantine", a rational and legal form of medical practice, adding to it some values and attitudes that eventually lead to further discriminatory actions.

The discussion so far has furnished the essential conceptual elements for the negative quarantine concept. In what follows, we assemble some observational basis for this concept, drawing on diverse sources of media information and secondary data.

3. Methodology and data

With the spread of the coronavirus to CEE, a state of emergency was declared by the governments to tackle and contain the spread of the virus. The lockdown started in Romania on the 16th of March and ended on the 15th of May, followed by an uninterrupted state of alert in which most of the stricter measures of isolation were lifted. For our research we used both quantitative and qualitative data (Berescu, 2010; Horváth, 2017; IRES, 2020) in order to better grasp:

a. The structural conditions that hamper Roma to better cope with the spread of the coronavirus, such as poverty, lack of space, lack of access to public utilities in the households, and overcrowding; and
b. The portrayal of negative quarantine in mass media and social media.

We use both hetero- (identified by others as "Roma") and self-ascribed ethnic identification from recent policy-driven research. The methodological difficulties of using a certain type of identification is described by scholars such as Messing (2014) and Surdu (2016) that showed that Roma ethnicity may have different meanings in different socio-economic and political contexts. Our aim was to relate the data gathered through the media survey with the monitoring of social media, and the secondary data from recent quantitative studies on the quality of life in segregated Roma ghettos.

For the structural conditions of segregated communities, we used the SocioRoMap (2014–2017) database, the most recent major research on compact Roma communities in Romania. The database contains, among other elements, information on the number of households in segregated areas, their sources of income, access to public utilities and living conditions (e.g. overcrowding). As will be shown in the next section, the segregated Roma were ill equipped to cope with the medical and economic consequences of the coronavirus outbreak.

On the other hand, we use discourse analysis from mainstream news platforms and newspapers as well as pieces of information from Roma related platforms (RomLink and Aresel) and social media, to define the practice of negative quarantine during the state of emergency. We also scrutinised the mainstream newspapers and news platforms for information on the most visible cases of quarantined Roma ghettos, in order to interrogate the discursive mechanisms and practices through which negative quarantine was imposed and normalised.

We selected our mass media articles and social media posts as follows. We monitored the national news online platforms: Hotnews, G4media, Mediafax and Agerpres between 15 March and 15 May 2020. We identified the articles and news items using combinations of keywords such as "Roma", "Covid-19", "quarantine", "Roma scandals", "ghetto" or "colonie" (Romanian word for segregated Roma settlement). We collected 163 media and social media items, reporting on 30 Roma-inhabited places from Romania, of which 14 are shown in Figure 1. Media arguments often have an ideological overreach that suggest that the quarantining of the Roma neighbourhoods should go beyond the medical interventions and serve rather as a disciplinary mechanism to govern the "uncivilised" and "undisciplined" Roma. The titles from national and local news platforms were translated into English and referenced only in the body of the article.

We complemented our information from media news platforms with social media posts from the Facebook page RomLink, one of the most active Roma social media pages, whose goal is "to inform about Roma issues and support networking between Roma activists and employees in public administration and state institutions working to improve the situation of Roma, combat racism and discrimination and promote respect of human rights" (RomLink, 2021). The page hosted many posts related to the quarantine conditions and illustrations of the over-policing that took place in several segregated settlements.

4. Results and discussion

Our findings have been grouped under four main headings. The first subsection provides secondary data from a recent research project on Roma from Romania. The subsection outlines the conditions that affected Roma ghettos before the pandemic, which made their coping with the Covid-19 effects even more difficult than for the rest of the population. The second subsection reveals the discursive response to the sudden return of the Roma from Western Europe to Romania. It highlights the racialised underpinnings of this discourse relayed by political and opinion leaders in the media. The third subsection pays attention to the ways in which Romanian media have portrayed the lockdown through an ethnic frame. The final part of the findings broaches the key features of the newly minted concept of negative quarantine as a form of governance. This is characterised by a set of framings and practices that guard society against the threat posed by the "infectious Other" through over-policing of the quarantined areas and regulation of movement. All these went beyond medical interventions and were used to discipline the quarantined ethnic population, along racialised lines.

4.1 Data on pre-existing conditions in Roma ghettos in Romania

The state of emergency and the self-isolation measures in spring 2020 have likely deepened the poverty in ghetto settlements, since many inhabitants worked in low paid jobs that depended on contacts with other people or were involved in the recycling industry or collecting scrap materials (Cace et al., 2010). The "at risk of poverty" rate for Roma reaches 80%, while one quarter of the persons live in households where at least one person had to go to bed hungry at least once a month (FRA, 2018). While the health experts recommended physical distancing, strict personal hygiene and the protection of vulnerable categories, this is hardly possible in many settlements, where overcrowding, living in multigenerational households and poor access to sanitation are common. The most impoverished Roma were thus doubly hit by the lockdown measures because of the informal and mobile economic activities that generate most of their income, as well as their substandard, overcrowded housing conditions.

The state of exclusion of the Roma is well embedded in history (Barany, 2002; Powell and Lever, 2017; Anghel, 2018) and the recent developments of the post-socialist era saw, at least in the first twenty years after 1989, a worsening of the situation of the ghettos. First, the total number of ghetto

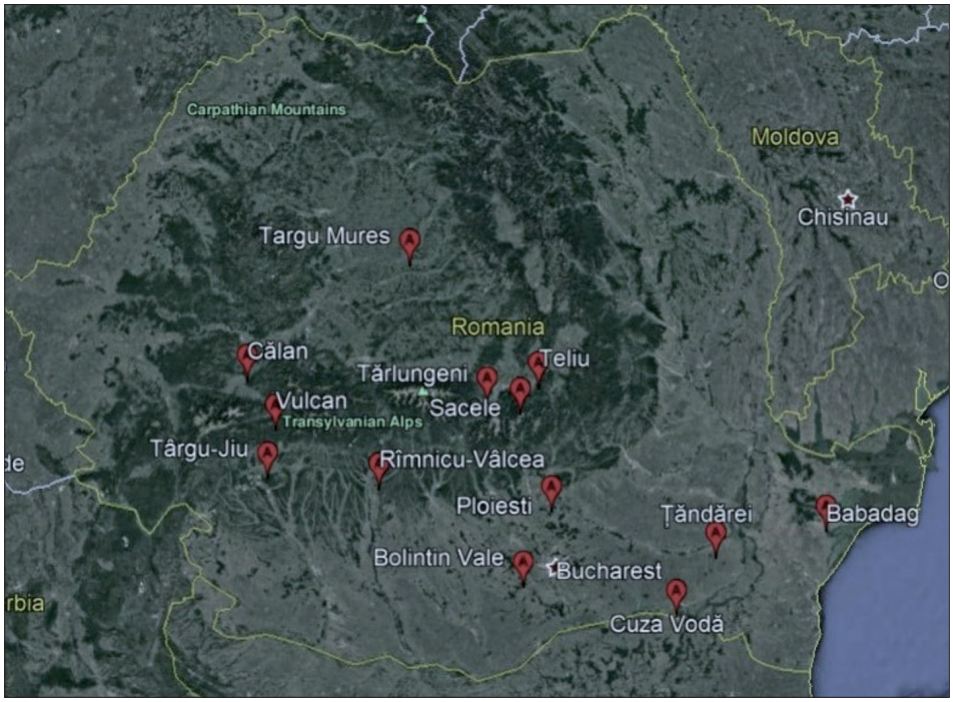

Fig. 1: Places of most intensive media-reported conflicts between segregated Roma and local police forces/ authorities during the state of emergency in Romania. Source: authors' compilation

inhabitants, exceeding half a million or 46% of all Romanian Roma according to the SocioRoMap data (Horváth, 2017), is large in comparison to other CEE states. For example, in Slovakia, it is estimated that over 68,000 Roma live in segregated settlements, or 17% of the Roma population, while in Hungary a rough estimate of 20–26% or 134.000 Roma are presumed to live in "colony-dwellings" (Kosa, Darago, and Adany, 2009; Mušinka, 2014).

Second, the Roma ghettos in Romania are widespread and diffuse across towns and villages, suggesting that patterns of negative quarantining are potentially extensive. According to SocioRoMap, 97.6% of all Roma live in 3,490 territorial units corresponding to 27.6% of Romania's territorial units (Horváth, 2017, p. 79). Additional in-depth information was collected for 2,315 segregated communities, totalling 557,137 Roma persons out of the 1,215,846 hetero-identified Roma. For our research interest, we used indicators regarding access to potable water, number of households with running water inside their house, overcrowding, living conditions and informal sources of income that require work outside the compact group, for all 2,315 segregated communities.

Figure 2 shows that there were several layers of hardship imposed on the Roma during the lockdown. The first one was at the macro level, which referred to restrictions on travel for most Romanian migrants working abroad. According to SocioRoMap estimates, there were 284 compact groups, comprising 125,300 people in which more than 30% of the working age population worked abroad. Once the cross-border travel was restricted, all these communities were potentially affected by the reduction in foreign-based income. The Roma were particularly hard hit, since their main means of travel were cars and small vans which were easily targetted by border police. Many ended in improvised quarantining centres, some of which were criticised for their unhygienic conditions.

Second, based on SocioRoMap estimates, we compiled the income sources of the 30% most precarious segregated Roma communities. In a total of 527 compact groups with a combined population of 147,600 individuals, at least 30% of those able to work did so as daily labourers, and for this they most likely had to leave their segregated areas to find employment. Although fewer in number, there were also compact Roma groups that relied on even more precarious sources of income, such as the collection of forest fruits, the collection of recyclable materials or begging, all of which were outside their living areas. These instances show that Roma ghettos were heavily dependent on external resources and the curtailment of their daily movement had a negative impact on their livelihood.

Thirdly, the imposed quarantine has tended to increase the pressure on community resources, such as water and access to services. Self-isolation was very difficult when the source of water was located outside the home. There were 1,495 compact groups with a total population of 397,200 individuals, in which running water was available for at most 30% of households. Private bathrooms were even rarer in such communities, with 1,882 groups (527,200 individuals) having bathrooms in at most 30% of households (Horváth, 2017). For both these indispensable facilities in the fight against Covid-19, namely running water and private bathrooms, there was acute deprivation compared to the majority, only 49% being equipped with indoor running water and just 59% with private bathrooms.

Fourth, Roma households were ill equipped to cope with the medical and economic consequences of the coronavirus outbreak. More than two thirds of them were at risk of poverty, almost three times higher than the national average (FRA, 2018, p. 33). Some were engaged in economic practices that required physical and social interactions or work in the informal market, which meant that they could not receive any compensation for the loss of income suffered as a result of the restrictions imposed by the state of emergency due to the current pandemic. The social protection system has poor efficiency and does not always reach those most in need. The World Bank's Report on Roma Inclusion in Romania revealed that social protection programs reduced by a mere 9% the share of Roma households living in poverty in the lower quintile (from 82 to 73%) (World Bank, 2014, p. 135). The Guaranteed Minimum Income, the main instrument for anti-poverty alleviation, has devalued over time, reaching now only

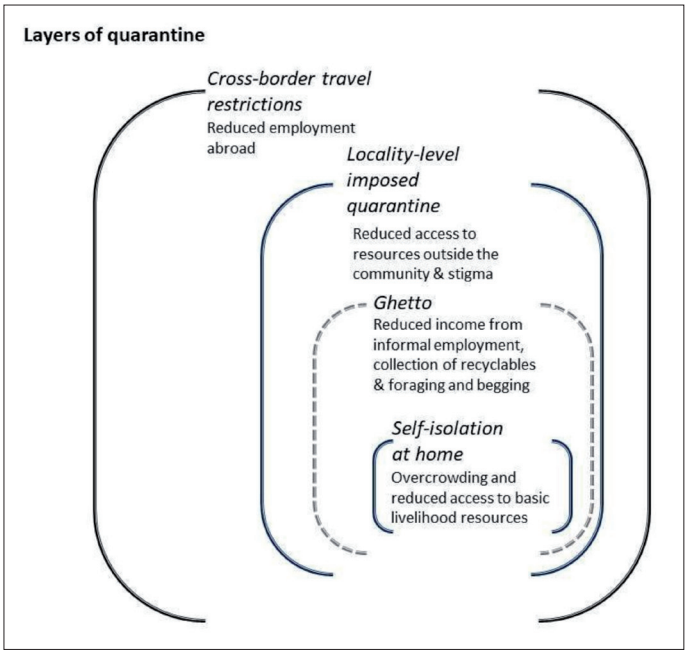

Fig. 2: The layers of quarantine and their impact on the mobility of the Roma
Source: authors' conceptualisation

one tenth of the net minimum wage at just 29 euros/person. This made the acquisition of disinfectants and masks difficult. Moreover, cash savings were absent in these communities, completely dominated by loan sharks, therefore the inhabitants were more prone to starve in times of hardship.

Recent and previous research reveals that most of the Romanian Roma from compact and segregated communities live in overcrowded or crowded households. For example, Horváth (2017) used the last Romanian census data from 2011 to show that the average number of persons per room in Roma households was 2.7, while their own research on compact communities indicated that half of the Roma lived in overcrowded households, meaning more than 4.5 persons/room, while another quarter lived in crowded households, with between 2.7 and 4.5 persons/room (Horváth, 2017, p. 104). This means that almost 75% of the Roma live in overcrowded households which made physical distancing difficult if not impossible. Also, almost half of the families lived in just one room, while in 13% of the cases, multiple families reside in one room.

Half of the Roma from compact communities live in households that are inadequate for living, such as improvised shelters, containers, abandoned industrial facilities, former socialist workers' dormitories, or colonies (Horváth, 2017, p. 109). The very low quality of housing, linked with the disappearance of the social housing sector (Şoaită, 2017; Turcu, 2017) and with the inefficient administrative policies directed towards large housing estates, especially those with vulnerable populations (Marin and Chelcea, 2018), led to a major housing crisis for the poor, further deepened by a policy of evictions (Berescu, 2010; Lancione, 2019).

The pre-existing conditions have revealed that ghettos lacked the basic resources that would have made their inhabitants self-sufficient for more than a few days. Securing their precarious income through informal activities, which was quite common as shown above, prevented the ghetto residents from having access to the legal permissions issued by formal employers. Lacking these legal documents rendered their subsistence work illegal and thus punishable by the police. As will be shown below, the limitations on movement, abroad and internal, went beyond the formal level and acquired a whole discursive edifice activating distinct racialised tropes. The way in which the negative quarantine affected Roma ghettos was by cutting-off the vital flows, economic and social, between the ghetto and the outside world.

4.2 Migration, sudden return, and the epidemiological outcry

Since Romania became an EU member state in 2007, the migration of Roma towards Western Europe has been highly politicised and framed as presumably "natural nomadism" by mass media and political actors. Anthropological studies have revealed however that the motivations behind their migration are linked, as in the case of non-Roma, to the lack of better socio-economic conditions in the countries of origin and to the attempt to build a better future in the West (Cherkezova and Tomova, 2013). The Roma have adopted a circular transnational labour migration (in agriculture and construction) that helped improve their socio-economic status in their home country and to contest their symbolic subordination *vis-à-vis* the majority (Troc, 2012; Toma, Tesăr and Fosztó, 2014, 2018). As with many other CEE migrants, however, the pandemic signified the return of many Romanian Roma, which led to a heightening of racist and stigmatising discourses.

One of the most obvious instances of scapegoating Roma migration occurred in May 2020, when former president Traian Băsescu affirmed that "the nomad Roma, who are incapable to integrate [...] have now returned home, because isolation has been introduced throughout Europe. And if they were to remain in Europe, only they would be on the streets with the *carabinieri*, the police and the *gendarmerie*, and they would not like it, because they would be treated worse than the [treatment they] receive from our *gendarmerie*!" Nicolae Bacalbaşa, a former Romanian deputy, inflamed the public sphere by stating on his social media page that while "the Chinese got their virus from their bats, we'll get it from our crows" (the latter is a slur word for Roma). These kinds of public statements coming from high-level political figures reveal an ideological background for the practice of negative quarantine, eagerly backed by the media. In April 2020, while still at the outburst of Covid-19, a renowned journalist created on a television post a build-up of threatening narratives suggesting an actual Roma "invasion":

> [A]lthough data on ethnic affiliations of the returnees are not available in the last 20 days [April 1–20], the daily average of entries in the country was 1,000 Romanian citizens, of which 800 are Roma… there is no discrimination, they are our compatriots, but we know very well that this area of crime is very important to understand from the perspective of entering the country […] We are going to show you a moment when Rome is put under terror. It is about the way in which some Romanian citizens of Roma ethnicity practically placed the capital of Italy under terror (Antena 3 TV station, as cited by Centrul de Resurse Juridice et al., 2020).

The conceptualisation of Roma migration in terms of "welfare scroungers", who do not want to work but prefer to live from illegal activities, is not novel. The permanent policing and racial targetting of Roma in Western Europe have rendered an "un/free mobility" (Yildiz and Genova, 2017) regime, in which many Roma are unable to exercise their EU citizenship because of the securitisation practices that subjects them to exceptional measures and renders them in a permanent state of deportability (De Genova, 2002) or evictability (van Baar, 2017). The effects of mobility on Roma communities are complex and multidimensional, however, and they also entail complex positive effects (Toma and Fosztó, 2018), not only through remittances, but also in terms of their human rights self-awareness and capacity to communicate. This was demonstrated by the intense communication on social media of the Roma that were quarantined in hastily improvised special quarantine centres at the beginning of the pandemic, and in which the conditions were dire. This intense communication took the form of live videos on Facebook and their extended sharing. In some cases, there were ad hoc protests by the Roma against the inadequate accommodation and substandard utilities.

The pendular migration process in which they were involved had suddenly faced several barriers, which laid bare the structure of governance that overwhelmingly affects marginalised people that live in segregated areas (Picker, 2017). For the Roma returning from Western European marginalised areas, such as *campo nomadi* or informal camps, plagued by similar conditions (Stasolla and Vitale, 2020), this meant entering a state of limbo, as authorities grappled with the solutions to their mobility. Also, the perspective of returning to their modest living conditions from which they had left, added to their distress.

4.3 Ethnicising the lockdown: how media portrayed Roma neighbourhoods

Imposing the strict lockdown by local authorities met little to no resistance from the general population, due in part, perhaps, to pre-existing racial stereotypes. The latter were revealed by a recent survey on the perception of the Roma during the first stage of the Covid-19 pandemic that were collected by a Romanian polling institute (IRES) in June 2020. According to the poll, more than two thirds of Romanians saw the Roma as creating a bad image for Romania, while 60% thought that police violence against the Roma was justified (see Fig. 3). The same pollster revealed that when respondents were asked about the main vectors for spreading Covid-19, Roma were assigned the third position, after the diaspora and the mostly imaginary category of "the immigrants" (IRES, 2020).

As the national TV station Antena 3 claimed in a popular talk show: "The worst part of the coronavirus pandemic in Romania [was] the return of the clans that terrorised Europe". They mentioned the return of some 16,000 Roma, without providing any source of information, a failure for which they were sanctioned by the National Audio-Visual Council of Romania. The focus of much news reporting was the breaking of quarantine rules by the returning Roma. A case in point is the small town of Ţăndărei (population 12,000), where, according to police sources, 800 Roma who returned from the UK, Germany and Spain were guarded by police to remain indoors. Similarly, 900 Roma returned to the city of Babadag, a situation which was described by the national news platform Hotnews (2020), under the title: "A town quarter of 2,500, mostly Roma, has been quarantined", as follows:

> People in the city quarter [where several Covid 19 cases were detected] move freely, without consideration for the limitations imposed by the military decrees. The buildings which they inhabit have multiple entries and as soon as the police officers withdraw, they re-emerge on the streets or move between their yards, as the fences separating them are in disrepair or missing.

To contain these potential rule offenders, the local police force asked for support from the national police. The description of these facts was associated with racialising observations, such as the alleged reasons for the return of the Roma from abroad was that they had apparently lost their "employment" there – a derisive term associated with petty or organised crime – and have now come back to Romania to break quarantining rules and infect the majority population. This is nothing new in the history of pandemics and, as Matache, Leaning and Bhabba (2020) aptly put it: "Racist scapegoating of outsiders in times of epidemic is a strategy with an ancient pedigree."

Less visible are the low-profile cases in which segregated areas inhabited by poor Roma were quarantined. In such cases, the areas were cordoned off from the community. This happened in a Roma ghetto in the city of Târgu Jiu, where the local media news platform gorjeanul.ro informed the reader that "The Roma from two districts of Târgu Jiu, [were] kept in quarantine at gunpoint! Police crews guarded the exit from Obreja neighbourhood" and "[outside the quarantined areas] the rest of the population was very relaxed, the streets teeming with pedestrians and shoppers".

In some cases, food and other vital supplies were offered to the quarantined ghettos to confront local significant challenges. For example, one regional media outlet, replicaonline.ro, titled at the beginning of May: "Hell on earth at Cuza Voda: People are howling for food behind fences, the authorities are overwhelmed", a cruel account of a real situation, described with a visibly dehumanising touch. Many other cases, like Vulcan, Călan, Vâlcea, etc, were only visible on social media, and pointed to the same severe food shortages and institutional abandonment.

Mainstream media were less prone to racist attacks; nevertheless, the selection of outbreak cases was far from being colour blind. Even when the Roma were not mentioned, the images were telling a racialised story. The combination of blatant racism and the ignoring of structural problems lead to an invisibilisation of the social and economic conditions under a plethora of "exotic" cases. In brief, the stress on the scandalous brushed aside the structural conditions of disadvantaged Roma neighbourhoods.

In several localities, such as Săcele, Teliu, Tărlungeni, Bărbuleşti, and Ţăndărei, major police interventions took place. A news website titled: "City hall under siege: After their return from England, the *stranieri* (ironic name for capped Romanian football players playing abroad) have broken the quarantining rules and terrorised the locality". In the Transylvanian village of Teliu, the Roma rioted for food, threatening the mayor to "give them food or else they

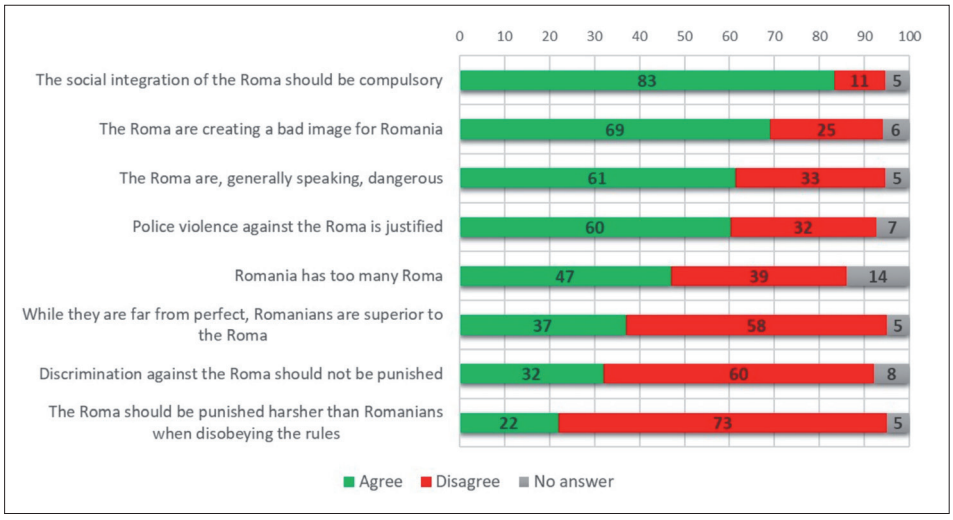

Fig. 3: Political positions of Romanian citizens towards the Roma
Source: IRES (2020)

will cut off his throat", as reported by the Naţional news blog in April 2020. Their request for food and other necessities made local authorities claim that they felt "under siege", and did not result in major conflicts in the end, but it pointed out to the fact that the communities experienced acute hunger in the short term, and they were contemplating severe undernourishment in the long run.

Several family feasts organised by some Roma were taken as indicative of the entire group's failure to obey quarantining rules. On occasion, as the national news platform G4media stated, "violent scandals in Roma-inhabited quarters in Bucharest, Ploieşti and Săcele" caused the police forces to intervene. While the events themselves were based on a challenge-response mechanism, as the police were occasionally challenged by some Roma to intervene, the reactions of the public through social media revealed racist attitudes. The regime of imposition of the quarantine and the means through which it was exercised can be characterised as over-policing, sometimes with an overwhelming show of force against those who broke the rules (Ivasiuc, 2015).

In a Facebook video posted by the Romanian Police, an armada of police vehicles with wailing sirens was shown entering the town of Ţăndărei in early April to contain a Covid-19 outbreak in the Roma quarter. A similar video of an oversised intervention was broadcast at the end of March on a regional media outlet in Târgu Mureş, where police cars and unarmed soldiers patrolled in early March the Roma quarter of Valea Rece urging people to stay indoors. The national television Digi24 showed a night video of helicopter surveillance of the Rahova quarter of Bucharest, following a violent conflict with "Roma clans". Keeping the infectious Other at a distance is a regular securitisation practice, which is not efficient as a sanitary measure but is employed for its performative value.

Fig. 4: A very long convoy of national police vehicles on their way to the quarantined town of Ţăndărei, labeled as "Action in Ialomiţa County!". Source: https://www.facebook.com/www.politiaromana.ro/videos/687997445275761/

In this tense context, a well-fed individual from the Roma-inhabited Rahova quarter of Bucharest, nicknamed "Spartacus", challenged the police to come to his place, where he was having a big party with around 40 guests and threatening that he would turn over their cars. He instantly rose to national notoriety and was portrayed as representative for an entire minority, as part of a recurring strategy of representing Roma as unruly, violent, rough and abusive scandalmongers. The episode ended with lots of gunshots in the air and with the imprisonment of five people. Soon "Spartacus" became a common noun for non-law-abiding individuals, also dubbed as *bombardieri* (bombardiers, i.e. boxing people), seen as the spearhead of the community transmission of the virus. The real victims, however, were two Roma neighbours who were severely beaten by the police, though innocent and definitely not part of the scandal.

The helicopters sent above Rahova to survey other possible illegal parties also marked the apex of the lockdown policies and were not just a surveillance action, but also a media stunt through which the invisible enemy was meant to become visible. This was based on the fact that Bucharest's urban ghettos of Rahova and Ferentari are the epitome of unruly, informal areas of Bucharest (Berescu, 2011; Teodorescu, 2018) with nationwide fame. The excessive use of violence was partly enabled by a temporary suspension of the Council of Europe (CoE) human rights provisions, taking advantage of Article 15, which allows signatory countries to derogate from the CoE convention in times of a "public emergency threatening the life of the nation." (EURACTIV, 2020a). The performative value of these interventions is shown in the fact that these police actions were not repeated after the end of the state of emergency.

4.4 A breakdown of quarantine features as applied to the ghetto

While the neutral, medical aim of isolation was to prevent the community transmission of Covid-19, in negative quarantine terms, the aim was to safeguard society from a major threat posed by a distinct part of it, namely the infectious Other. Antithetically, the aim of positive quarantine was to demonstrate the capacity of the "civilised" part of society to align to a common moral goal.

While regulation of movement and curfew were the major measures that supported the aim of isolation, in their negative dimension they were intended to prevent the mix with a population that was already perceived as "unmixable", a common racist stereotype. For the "positive quarantine" endorsers, the conformation to the rules was framed as a rational adaptation to the risks associated with Covid-19. From the latter standpoint, any movement of the poor in search of means of subsistence was "excessive", hence irrational. The opposition between a majority that sees itself as a settled population vs. a nomadic one, though fake, is constantly mobilised and reactivated whenever it serves the purpose to make a distinction based on the legitimacy of movement (see also van Baar, 2017).

For example, a Romanian daily, Gândul, titled one of its articles: "The Roma camps from London return to Romania", and this turned into a Facebook meme which showed a murder of crows on a fence with the title: "All flights grounded on Ţăndărei airport". The 12,000-inhabitant town became prominent on the media scene even before the pandemic, due to a scandal related to child trafficking, spectacularly stormed by joint British-Romanian police

Fig. 5: Military police patrolling Rahova in Bucharest, Sector 5. The subtitle says that it arrived "in the area of the slaughter" in an article titled "Spartacus put the army on fire. Military patrol in front of his house after "the circus" ended". Source: https://www.stiripesurse.ro/spartacus-a-pus-si-armata-pe-jar-patrula-de-politie-militara-postata-la-casa-barbatului-dupa-circul-din-rahova_1455583.html

Fig. 6: Facebook meme suggesting that the quarantining of a Roma (crow)-inhabited town was like the grounding of planes on an airport. Source: https://romania.europalibera.org/a/cncd-vladimir-tismaneanu-amendat-cu-5-000-de-lei-pentru-postarea-despre-tandarei/30595800.html

forces that used helicopters to arrest several local leaders. After one well-known Romanian intellectual shared it on his page, it triggered a huge reaction of protest among civil society and a fine by the NCCD (Necula, 2020).

This hard line of racist remarks was briefly reversed during the asparagus harvest in Germany. Due to the sudden demand for agricultural workers to harvest the asparagus, the image of the threatening low-skilled worker returning to Romania was replaced with that of the "essential worker" saving German asparagus production, and thus became an almost heroic figure of the anti-pandemic fight.

The lack of access to goods and services was what distinguished segregated communities from the non-segregated areas of the locality. Underequipped places had to supplant the lack of services through the enhanced mobility of their residents. With the imposition of the quarantine, any sort of vital movement became not only immoral, but illegal. The moral superiority of the middle class was based on socio-economic privilege and was epitomised by the use of digitally mediated work, while household consumption was based on delivery services (Bădoi, 2020).

This was turned into a discourse about a morally desirable form of quarantine – a positive one – which became dominant and revealed an asymmetric access to the media. The fundamental need to access physical services or manual work was diminished. While the material challenges that affected the entire society generated unequal effects across various socio-economic groups, they were more severe for the Roma ghettos.

The policies of visibility were part of a discursive device that was employed by the media to render visible processes that were elusive, such as the spreading of Covid-19. The

images during the lockdown showed partying or congregating Roma, suggesting that the disease might easily spread from those places. This helped visualise the rationale for imposing negative quarantine. While the neutral quarantine was fed by images and messages of shared responsibility for flattening the curve of infections, the positive quarantine was a parade of virtue signalling on social media. The latter was suggested by Facebook posts and pictures championing creative home-based activities, mediated social activities and various self-restraint initiatives, all in the name of keeping the spread of the virus at bay. After the lockdown was lifted, these images were less frequently used. The discourse of positive quarantine was briefly revived, however, on the TV station Digi24 through statements of the self-proclaimed King of the Roma advising everybody, including all Roma, to respect the protection measures.

The reflection of several incidents in Roma communities in the mass media closely followed the ill-famed Roma quarters, which largely illustrated the practices of sensationalism and poorly informed reports. Although one third of the respondents from the above-mentioned IRES poll acknowledged an increase in the anti-Roma hate speech, just one in ten associated the spread of the virus with the Roma. This should be read in the particular dynamic of the popular understanding of Covid-19, one in which solid knowledge was built up very slowly and is still incomplete, while a variety of conspiracy theories gained a prominent place for various groups (Stoica and Umbreş, 2020).

5. Conclusions

This article engages with the idea that the quarantine imposed by the Covid-19 pandemic can be conceptualised through a threefold classification of positive, neutral, and negative quarantine. Each of these categories applies distinct but interrelated logics of quarantining for different socio-economic groups. Since the outbreak of the pandemic, the Roma living in segregated ghettos and slum areas have experienced what we have termed negative quarantine. This had both a structural and a discursive dimension and can therefore be used as an exploratory tool for upcoming epidemiological crises. Since quarantining is not exclusively a medical act, we can only ask whether it is, in the case of the Roma, a form of moral panic. In terms of urban governance, the inability of the authorities to have a quick and decent response to the problems raised by the pandemic, indicated that the effects of negative quarantine might be not only hunger and social unrest, but a deepening of urban segregation.

By blaming the Roma for their weaker hygiene standards, the securitisation practices that have sprung in many of the poor, often informal and segregated settlements in CEE tended to invisibilise complex mechanisms of socio-economic and political exclusion and marginalisation that have historically plagued Roma settlements. Special measures of containment were enforced in several places, arguing that it is the Roma who do not respect hygiene standards and physical distance, obliterating thus the lack of access to basic utilities and the overcrowded and substandard housing conditions, which made isolation and proper hygiene nearly impossible. As reflected in the perception of the Roma during the pandemic, this might serve in future crisis-prone situations as an argument for enforcing a disciplinary policy that goes beyond the aim of medical intervention.

We have showed that Roma communities have been on the losing side of quarantining policies, in those areas with many return migrants from Western Europe. The sudden influx of Covid-19 suspects had led to exceptional measures of quarantine, with little regard for, or even total disregard for the livelihood effects on the quarantined ghetto areas. The early 2020 climate of fear was soon replaced by a climate of distrust in authorities and by the proliferation of conspiracy theories. Surprisingly, this did not include the Roma, the racist attacks stagnated, and the negative quarantine did not develop for the time being.

"Negative quarantine" is offered in this contribution as a concept to reveal diverging institutional logics of safeguarding public health during and after an epidemic. This concept problematises processes of social sorting that are activated during crisis situations, such as epidemics. Its origins are largely path-dependent, as the "infectious" communities or individuals are those that have been stigmatised and marginalised before. The implications are open ended and aggravating since they reverse the logic of protecting public health into a logic of social punishment of segregated areas. For the time being, the scapegoating of the Roma did not escalate, but the problem is still present and can worsen at any time. From a policy perspective, the quarantine can no longer be seen as a neutral, technical, and medical procedure, but needs to be considered as a complex practice with ramified implications in the governance, administration and planning of marginalised areas.

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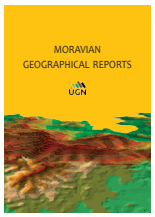

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The influence of the Covid-19 pandemic on Czech-Polish cross-border cooperation: From debordering to re-bordering?

Hynek BÖHM [a,b] *

Abstract:

The COVID-19 pandemic brought many changes to social behaviours in Europe. One of its major consequences was the temporary closure of borders, which was introduced as a measure to prevent the uncontrolled pandemic spreading and involved internal Schengen borders. This has had a major impact in the way in which cross-border cooperation has been conducted in Europe, including the Czech-Polish borderland, as it dramatically restrained all flows across borders. In this paper, we evaluate the impact of the pandemic on five roles of cross-border cooperation: 1) as a multi-level governance form; 2) as a regional development tool; 3) as a para-diplomacy form; 4) as a post-conflict reconciliation tool; and 5) as Europe-building. We argue that the impacts of the pandemic complicated regional development and the Europe-building role of cross-border cooperation in the Czech-Polish borderland. The article envisages re-bordering processes also in the Czech-Polish borderland, but with important exceptions in the regions with a high level of cross-border integration, mainly in the Euroregion Těšínské Slezsko/Śląsk Cieszyński. The paper also calls for the elaboration of the guidelines for possible repeated (Schengen) border closures and proposes modifications of the INTERREG microprojects schemes, to keep them attractive also in times of expected cuts in public finances.

Key words: *COVID-19 pandemic; re-bordering; cross-border cooperation and its roles; Czech-Polish border; Poland; Czech Republic*

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1. Introduction

The Schengen space and the narrative of free border crossings constitute cornerstones of European integration (Scott, 2016). The developed cross-border cooperation (CBC) is an integral part of this story. A substantial part of Europeans (used to) cross national borders on a daily or weekly basis for education, work or leisure (ESPON, 2018; Jaansoo, 2019) and contributed thus to de-territorialism (Medeiros et al., 2020). The decreasing importance of national borders, studied as debordering, created a mainstream of border scholarship (Brunet-Jailly and Wassenberg, 2020).

This story started to be harpooned by growing Euroscepticism, which had Brexit as its main consequence so far (Riedel, 2018). Migration crises and the related increase of populism based on identarian/localism discourses in the world and European politics brought along observable re-bordering (Wassenberg, 2020). Despite some European Union (EU) Member States introducing temporary border-checks as a reaction to migration waves and terrorism acts in 2015, the borders were generally open until March 2020. Then the epidemic danger affected Schengen space and imposed physical barriers on EU internal borders, which dramatically lowered the intensities of cross-border flows.

The border closure of March 2020 was imposed as an immediate, yet doubtful (Espinoza, Castillo-Chavez and Perrings, 2020) reaction to the COVID-19 pandemic, as a universal panacea for the EU and much of the world. It reminds one very much of the role of borders as a barrier to protect from a neighbour – implicitly suspicious to be the infected one. It also constitutes an example of applying the "us and them" logic (van Houtum and Van Der Velde, 2004), a major mental CBC obstacle, which can sometimes be more severe than the 'hard' versions (Havlíček, Jeřábek and Dokoupil, 2018). Given the relatively recent outbreak of this health crisis, there have been few robust research projects finished so far. We can work, however, with the first reactions in the form of scientific articles (Medeiros et al., 2020; Opiłowska, 2020), blogs and non-peer-

[a] Institute of Political and Administrative Sciences, University of Opole, Opole, Poland (*corresponding author: H. Böhm, e-mail: *hynek.bohm@uni.opole.pl*)

[b] Department of Geography, Faculty of Science, Humanities and Education, Technical University of Liberec, Liberec, Czech Republic

reviewed papers (Klatt, 2020; Jańczak, 2020; Berrod and Bruyas, 2020; Böhm, 2020). They observed massive re-bordering tendencies, as most of the measures based on social distancing were introduced on a strictly national basis and contradicted steps desired by the European institutions (Brunet-Jailly and Vannet, 2020). These restrictions made CBC very difficult to implement. Moreover, the pandemic has introduced a new level of uncertainty in all international – including cross-border – affairs and led many to question whether citizens will be able to continue enjoying the freedom of movement once the crisis is over (Calzada, 2020). Nevertheless, the pandemic also pointed to high levels of cross-border integration in some European cross-border regions, where the locals voiced themselves loudly against the closed borders (Opiłowska, 2020).

National borders were closed in many countries of the world. The border closures caused by the pandemic occurred mostly with the support of most of the public in the EU Member States (Euronews, 2020). Most European citizens have accepted the necessity to temporarily close the border due to public health reasons. In some EU Member States, however, citizens would agree on border closures also for mid- and long-term horizons. The public opinion polls conducted in the Czech Republic during the first pandemic wave revealed that about one third of the Czech population would agree to having the border closed for a longer period and 5% of them even forever (National Pandemic Alarm, 2020). This implies a fertile ground for re-bordering.

This article attempts to outline the principal influences of the COVID-19 pandemic on the development of CBC implemented in the Czech-Polish borderland, where the border was closed from March to June 2020. It tries to identify whether we can expect re-bordering trends in this territory in a long-term perspective. We also examine whether the concept of the five roles of cross-border cooperation (explained later) can be used to study the impacts of the pandemic on cooperation.

We worked with the hypothesis that these influences will appear to be negative and will substantially complicate Czech-Polish CBC. These prospects might result in studying re-bordering rather than de-bordering of this territory in the near future. This could bring a relatively new view on Czech-Polish CBC, as its scholarship has up to now predominantly focused on debordering (Pásztó et al., 2019; Böhm and Drápela, 2017; Böhm and Opioła, 2019). Scholars have identified a very high number of local cross-border connections between municipalities (Furmankiewicz, 2007). Dołzbłasz (2015, 2017), and Vaishar et al. (2013) have underlined the importance of cross-border tourism. Divided cities, mainly Cieszyn – Český Těšín, play an important integrating role in Czech-Polish CBC and its scholarship (Jańczak, 2014; Boháč, 2017; Zenderowski and Krycki, 2014).

This article is organised as follows: the first section provides an overview of the main research directions in border studies. While it identifies debordering as the current dominant part of the border studies research agenda, it dedicates special attention to the re-bordering processes in Schengen space. The next section outlines the methodology and the main materials which were analysed in the article. The fourth section deals with the recorded and possible impacts of the pandemic on Czech-Polish CBC on the basis of the latest texts covering other border contexts in the EU, unpublished reports and data, and presents an expected impact of the pandemic-related border closures on five different CBC roles – these roles are specified in subsection 2.1. The final section draws conclusions, which also advise on potential directions for further research of the Czech-Polish CBC.

2. References to study the impact of the pandemic on cross-border cooperation

The principle theoretical approaches to the study of CBC are outlined here. It introduces border studies as a specific intersection of several social sciences. Then it points at an expected shape of conceptual approaches to study borders, co-evidenced also by the pandemic: we could probably expect more studies of re-bordering in the near future. This contrasts to the border studies "mainstream", which has accented debordering/de-territorialism research endeavours.

2.1 Border studies as a specific intersection of several social sciences

We can argue that border scholarship focuses on frontiers and boundaries. The decreasing importance of borders is connected to the process of frontierisation, as it prompts the erosion of boundaries, which can be described as "sharply drawn lines that mark the limits of authority and ownership (…), marked, and managed, sometimes loosely and sometimes strictly in accordance with the various and changing purposes of the adjoining states" (Custred, 2011, p. 265). Limited border controls and the declining importance of borders lead to their increasing porosity, more intense interaction and consequently the emergence or reconstruction of the elements of a frontier (Jańczak, 2014; Böhm, 2019). Frontierisation applies to social, economic and political elements referring chiefly to borderland communities (O'Dowd and Wilson, 2002). As a result, frontiers are "zones of varying width, either political or cultural in nature" (Custred, 2011, p. 265). Assimilation or even expansion by one of the dominating parties is becoming a common frontier occurrence (Walters, 2004; Jańczak, 2014). A boundary is a mainly legal concept which separates state structures (O'Dowd and Wilson, 2002). The boundary not only separates from what is outside but at the same time bounds what is inside (Kristof, 1959).

We should not forget that these two processes unfold in a context of historical legacy, as well as in the actual border reality (Jańczak, 2014). Keeping in mind the historical origin of borders, both boundarisation and frontierisation reveal their two-fold nature. On the one hand, they reflect ongoing existing processes, therefore they constitute an element of a real policy specific to a time and place. On the other hand, they are set in a historical context where, until recently, borders served a different purpose, had a different form and ran along different lines. Both processes, however, debordering analysing frontierisation and re-bordering studying boundarisation, create the very core of border studies.

Brunet-Jailly (2005) proposed a theory of borderland studies, which is based upon the interplay of the following four analytical lenses: (1) market forces and trade flows; (2) policy activities of multiple levels of governments on adjacent borders; (3) the particular political clout of borderland communities; and (4) the specific culture of borderland communities.

According to this theory, if each of those analytical lenses complements/enhances one another, it enables an emergence of the culturally emerging and integrating borderland region. Brunet-Jailly's concept understands border studies as a specific interdisciplinary field, where geography meets

sociology, political sciences, cultural sciences, legal and administrative sciences, economics and history (Beck, 2018). Decoville (2013) identified structural, functional, ideational and institutional functions of CBC. Böhm (2020) follows the same interdisciplinary logic and argues that the CBC has five principal roles:

1. The role of multi-level governance of the territory: entities responsible for the management of CBC are composed of members, who represent various levels of public administration, most often municipalities and regions. Most of the cross-border groupings in the EU have the form of an Euroregion, while other legal forms such as European Groupings of Territorial Cooperation (EGTC) are on the rise in the EU (Dura et al., 2019). These groupings generally follow multi-level governance principles (Hooghe and Marks, 1993) in practice;
2. A regional development role: CBC can benefit from mutual cross-border complementarities. The existence of the Schengen space and European single market led to an increase in cross-border employment in the EU, as well as in the Czech-Polish borderland (Böhm and Opioła, 2019), and the growth of cross-border public services, which are implemented in areas such as transport, leisure or healthcare (ESPON, 2018). Sometimes, the existence of these services can lead to functional cross-border regions – for example the cross-border labour market region around Luxembourg, where massive cross-border flows take place, which required equal policy measures (Decoville et al., 2013);
3. The role of a para-diplomacy tool: for many municipalities, mainly smaller ones, the CBC is their only engagement in international cooperation (Klatt and Wassenberg, 2017; Duchacek, 1990);
4. The role in post-conflict reconciliation: many of the border regions in the EU are places of former conflicts, as is also the case in the east of the Czech-Polish border (Böhm and Drápela, 2017). The CBC is a tool which helps to mitigate the consequences of those conflicts, which has been demonstrated on the French-German or German-Dutch border (Klatt and Wassenberg, 2017); and
5. The previous four roles represent functions of the CBC. All of them exist to mitigate the barrier effect of the national border. They support the principle of mutual interdependence of neighbours and comply with the principal ideas of European integration (e.g. Scott, 2016). Hence, we can conclude that the CBC is a European integration element because it contributes to political and economic as well as cultural integration – see Figure 1.

The five above-mentioned roles cover functional, ideational, structural and institutional dimensions of CBC and reflect the interdisciplinarity of border studies. Hence, we decided to structure part of our research according to these roles: see Section 3.

In this article, we study the EU Schengen Area internal border between the Czech Republic and Poland. The question of EU internal borders is fundamental, as it reflects the ambiguity of European construction and its neither federal nor confederate nature. We no longer refer to "national borders" but to "internal borders", often without referring to the EU. This means, on the one hand, that the internal borders of the EU are special ones, but, on the other hand, that the border remains between the Member States or at least that it may be called upon to reappear (Bouveresse, 2020).

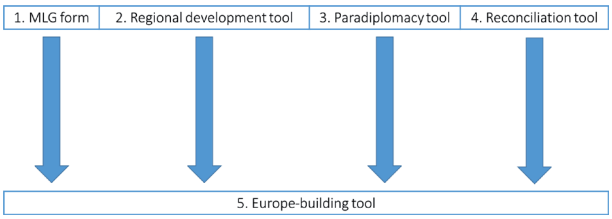

Fig. 1: The five roles of cross border cooperation
Source: author's elaboration based on Böhm (2020)

2.2 Researching debordering

Before the refugee crisis of 2015, most of the scholars focusing on CBC studied debordering. They claimed that multi-level governance, EU regional cohesion policies – especially the INTERREG programme, the Europe of Regions discourse and an increase of paradiplomatic activities of sub-nation state authorities – supported a consensus on rescaling Europe with an increasing influence of regional and local actors from a cross-border perspective (Klatt, 2018; Keating, 1998; Scott, 1999; Telo, 2007; Warleigh-Lack and Rosamond, 2011; Hooghe and Marks, 1993). The CBC, which is based on mutual interdependence, is associated, then, with the tangible successes of the European integration process (Scott, 2016).

In the last 20 years, the number of CBC structures has, especially with respect to the INTERREG programme, exploded in Europe (Zumbusch and Scherer, 2019). The proliferation of CBC and related discourses in political science are linked with the following international tendencies that have affected the status of national borders in recent years, as well as enhanced integration processes across these borders by various mechanisms (e.g. Perkmann, 2002; Scott, 1999):

- Globalisation and continuous internationalisation, Europeanisation as a top-down stimulus;
- Regionalisation and corresponding multi-level governance approaches as bottom-up emerging drivers;
- A changed understanding of borders from detrimental limitations to a source of opportunities;
- Increasing orientation from a territorial logic of space to functional spaces; and
- The opening of government and resultant governance processes in multi-actor, multinational constellations (Zumbusch and Scherer, 2019).

The Covid-19 pandemic has challenged all the above-mentioned cornerstones of debordering research. The pandemic showed that despite national borders which were once thought to be a feature of Europe's past, the pandemic has underlined how resilient and meaningful they continue to be (Castan Pinos and Radil, 2020).

2.3 Researching re-bordering

The systemic and everywhere-present closures of national borders during the Covid-19 pandemic introduced the largest re-bordering in the history of European integration. According to Falludi (2018), territorialism, understood as a collection of states, currently shapes national identities and perceptions of the world, which remains largely Westphalian, and the pandemic showed us that nation states continue to be the basic "social containers" which define the world system (Rufi et al., 2020) – even in the EU. Medeiros et al. (2020), in one of the first responses of border scholars to the new reality of Covid-19, related re-bordering to the term 'Covid-fencing', explained as the systematic closing

of national borders to the circulation of people. This Covid-fencing indicates that these territorialism perceptions enjoy an overwhelming acceptance, despite the authors' denial of the fact that the issue is black or white, and that they understand CBC to be a cement of European integration.

It was the 2015 refugee crisis, however, which led to a questioning of both the functions of borders in controlling migration, as well as European integration as a whole. The ideal of a "Europe without borders" was questioned because both the Schengen agreement and the Dublin convention were unable to deal with this crisis (Brunet-Jailly and Wassenberg, 2020). According to studies of the French-Italian border, the impact of the 2015-crisis related border checks on inhabitants of this region was rather symbolic than factual, as the checks concentrated on third-country nationals and left the majority of border crossings unaffected (Casella Colombeau, 2020). It would be incorrect or at least incomplete, however, to blame mere refugee crises. Svensson (2020, p. 2) points at the early 2000s, when global and regional geopolitical events had encouraged processes of re-bordering: "The 2001 terrorist attacks stood at the beginning of a period of securitisation with enhanced border controls … Moreover, the Arab Spring has started a domino process of instability in the European neighbourhood, which led to the of unregulated migration into and within the EU".

Before the Covid-19 pandemic or the 2015 refugee crisis, moreover, Scuzzarello and Kinvall (2012) claimed that temporary closures of borders in France and in Denmark aimed to show how some European nation-states attempted to reclaim their power of border control by tweaking the Schengen agreement. These events are not only examples of how countries manage inflow and outflow of people, but they are trying to reinstate narrative identity boundaries around the French and the Danish people by controlling the border. Scuzzarello and Kinvall (2012, p. 90) advocated that "… physical borders find legitimacy in boundaries, i.e. narratives that conceptually separate groups and territories", which they illustrated by means of an analysis of local media in both countries.

The concept of unfamiliarity (van der Velde and Spierings, 2010) could help to understand the increase of re-bordering approaches, as the pandemic made the closed borders an immobility zone within a bandwidth of unfamiliarity much larger – see Figure 2.

Klatt (2018, p. 572) claims that despite the fact that

> "…European integration in principle has been a story of debordering, border regions demonstrate that borders have been quite persistent and have continued to be the physical expression of state sovereignty, reflecting the complicated reality of the EC/EU of shared sovereignty between member states and supranational institutions. Furthermore, debordering of the EU has been challenged by competing political elites, who construct otherness to demonstrate efficiency and strength of dealing with alleged threats to security."

Despite the effect of the refugee crisis of 2015 which led to re-bordering processes such as the introduction of border controls or a militarisation of the border (Klatt, 2018), it was still an issue of a low number of borders – which contrasts to the collapse of Schengen system in the pandemic period, when just a part of German-Dutch border remained open. Given that the 2020 Covid-19 pandemic complicated border crossing and restrained cross-border flows, we expect that the pandemic and post-pandemic period might illuminate the study of processes of re-bordering.

3. Materials and methods

The work was organised in three steps: 1) desk research; 2) a focus group with the stakeholders of the Czech-Polish CBC; and 3) semi-structured interviews with an extended group of those stakeholders based on a rating scale, which helped to assess the importance of pandemic-related impacts on the CBC.

In the first desk-research phase, we benefitted from the fact that border scholars and CBC practitioners reacted to the pandemic and used multiple channels to do so. A content analysis (see Krippendorf, 2004; Neuendorf, 2017) of those works and presentations at topical e-conferences was conducted. As it was not possible to follow all relevant texts (often published without peer-review in thematic blogs) and e-events, the selection of sources may not have been exhaustive. We worked exclusively with papers and e-events held in English, Polish and Czech. With one exception from the Canadian-US border (Brunet-Jailly and Vannet, 2020), we focused on the European context (basing our work on the conference panel organised by Adam Mickiewicz University in Poznań on 21 May 2020, and the e-meeting "Cross-border cooperation in the age of pandemic", organised by the Association of European Border Regions on 5 June, 2020)[1].

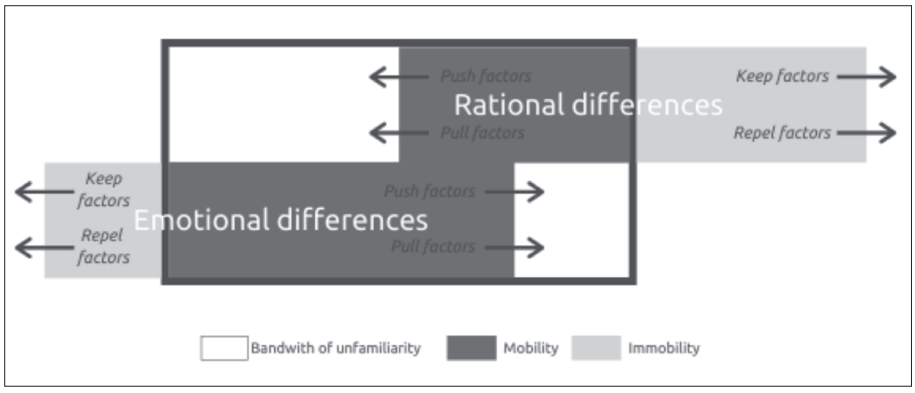

Fig. 2: Bandwidth of unfamiliarity
Source: author's elaboration based on Van der Velde and Spierings (2010)

[1] The record of these debates can be found here: https://www.facebook.com/watch/live/?v=246409096581222andref=watch_permalink and: https://www.facebook.com/AEBR.AGEG.ARFE/videos/2624424017826813

We also analysed the adopted anti-epidemic measures at the level of the Czech and Polish governments. We studied the decrees and other official documents published by these governments, representatives of local and regional actors, and commentaries of the media and other relevant actors in those decisions.

In the second phase we organised a focus group gathering stakeholders of Czech-Polish CBC, which was for the needs of this article structured around impacts of the pandemic on the above-mentioned five CBC roles[2]. We asked those stakeholders following questions:

- What is the impact of the pandemic on the role of cross-border cooperation as a tool of multi-level governance of the territory?
- What is the impact of the pandemic on the role of cross-border cooperation as a tool of regional development of the territory?
- What is the impact of the pandemic on the role of cross-border cooperation as a para-diplomacy form?
- What is the impact of the pandemic on the role of cross-border cooperation as a reconciliation tool? and
- What is the impact of pandemic on the role of cross-border cooperation as a Europe- building tool?

The invited CBC stakeholders represented secretariats of the selected four Czech-Polish Euroregions, with a high or at least average level of cross-border integration according to Pásztó et al. (2019): Euroregion Těšínské Slezsko/Śląsk Cieszyński, Euroregion Silesia, Euroregion Glacensis and Euroregion Nisa/Nysa/Neisse. We also profited from the presence of representatives of the Pedagogic Centre for Polish Minority Schools in the Czech Republic because this subject has actively contributed to many cross-border initiatives along the Czech-Polish border. We also invited representatives of both European Groupings of Territorial Cooperation from the Czech-Polish borderland, the EGTCs TRITIA and NOVUM, but they could not participate. Their opinions were obtained in the third phase, however.

The outcomes of the first two phases offered some preliminary results, which helped to identify the following group of six principal expected impacts of the pandemic on the Czech-Polish CBC:

1. The advent of unilateralism: the central state returned as a key (and only) actor, who bypassed existing cross-border governance structures, limited cross-border flows and substantially complicated CBC;
2. The limitations of cross-border flows damaged the local economies of the Czech-Polish borderland;
3. Border closures lowered the possibility of mutual cross-border contacts and events;
4. The pandemic contributed to the re-emergence of mutual animosities;
5. The economic crisis would decrease the revenues of local actors, which could limit their ability to conduct CBC; and
6. The implementation of INTERREG-funded projects was substantially complicated and/or disabled.

In the third phase of the research project, we applied a rating scale method, which was intended to rank the impacts and consequences of the closed border on the five CBC roles. A 'five to one' scale was used – where 5 stands for the greatest impact and 1 for the least impact. Despite its limitations (Krosnick and Presser, 2010; Uher, 2018), it was the most "economic" instrument to obtain reliable information in a relatively short time. We used this method in semi-structured interviews with fourteen experts – the same as those involved in the previous phase of the research, plus some new ones representing civic society (for the outcomes see Tab. 1).

4. Results: Impact of the pandemic and related border closures on Czech-Polish cross-border cooperation

There are six Euroregions, which have been created in the case study borderland since 1991 – see Figure 3. These regions have an important role in distributing Czech-Polish INTERREG funds: a sum of – 45.2 million – which is 20% of the entire programme envelope – was allocated for microprojects in the period 2014–2020, projects which are managed and distributed by Euroregions (INTERREG, 2015). These Euroregions have been the subject of scholarly attention (e.g. Siwek, 2018; Ptáček et al., 2017; Czepil and Opioła, 2013; Drápela and Bašta, 2018;

Consequences of the pandemic/ CBC roles	Multi-level governance	Regional development	Para-diplomacy	Reconciliation	European integration
Advent of unilateralism – central state as a key actor	3.1	2.6	1.6	3.1	4.7
Limitations of cross-border flows damage local economy	2.3	4.7	2.3	2.6	3.1
Limitation of cross-border events and contacts	2.4	3.1	2.6	3.8	3.6
Re-emergence of mutual animosities	2.4	2.7	3.0	4.0	3.3
Decreased revenues of local actors may limit their ability to conduct CBC	4.3	4.9	2.4	2.1	2.1
Complications for INTERREG programme	2.3	3.9	2.6	3.1	3.0
Summary	2.8	3.7	2.4	3.1	3.3

Tab. 1: The mean value of the N = 14 experts' assessments, rating the effect of the analysed factors on the five roles of CBC on a five-point rating scale, from 1 (lowest impact) to 5 (the highest impact)
Source: authors' calculations

[2] The record of this panel can be found (in Czech) on https://www.youtube.com/watch?v=u7Sdx1TMCe4

Furmankiewicz, Buryło and Dołżbłasz, 2020). One of the recent contributions assessed the cross-border (spatial) continuity on the entire borders using a comparative Euroregional perspective (Pászto et al., 2019). It identified the highest levels of such continuity in the eastern part of the Czech-Polish borderlands (Euroregion Těšínské Slezsko/Śląsk Cieszyński and Silesia), where no massive population changes were recorded and where the low language barrier does not prevent mutual cooperation (Pásztó et al., 2019; Böhm and Opioła, 2019). The most discontinuous region is Euroregion Praděd/Pradziad, which was influenced by population exchange and its current low population density and rural character (Pásztó et al., 2019).

The pandemic influenced cross-border practices in the entire Czech-Polish borderland, as it closed the mutual border, which was an unprecedented act since both countries joined the Schengen space in 2007. Poland reintroduced border controls at all internal Schengen land, air and sea borders, from 15 March to 12 June 2020. The Czech Republic, which did not have to do it with Poland and Slovakia, as these neighbours did it first, re-introduced its border control at land borders with Germany and Austria and air borders from 14 March to 13 June 2020. Border-crossing was permitted just for narrowly-specified groups – including cross-border commuters, who had their lives complicated by the quarantine obligations – at a limited number of border-crossing points, which made cross-border commuting much longer.

Our research of the impacts of border closures on the Czech-Polish CBC revealed six principal impacts: in subsection 4.1 we argue that this border closure was an act of unilateralism, which directly damaged the local economy and led to the lowering of cross-border contacts. It contributed to the rise of mutual animosities, but also to the increased visibility of active cross-border civic society and its responses to the crisis. In subsection 4.2, we try to assess the pandemic's impacts on the five roles of CBC and to rank which of those roles were the most affected ones.

4.1 The impact of border closures on Czech-Polish cross-border cooperation and their consequences

The desk research and work with the experts revealed six principal impacts and consequences of border closures on the Czech-Polish CBC. They will be presented in the following subsections 4.1.1–4.1.6.

4.1.1 The advent of unilateralism – the central state returned as a key (and only) actor

In the beginning of the pandemic in Europe, on 12 March 2020, the French president Macron tried to predict the development of the health crisis: "There will undoubtedly be control measures, border closures, but these measures must be taken as European ones, at the European level, because it's at this level that we've constructed our freedoms and protections" (Berrod and Bruyas, 2020, p. 2).

He was mistaken, as all EU Member States acted without major coordination almost exclusively on the national level. The behaviour of Polish and Czech governments was also an example of such unilateralism at the beginning of the pandemic: the Czech government had its first "pandemic" crisis meeting on 12 March 2020 and accepted nine decrees responding to the pandemic. Five of them limited the free movement of people across the border[3]. These measures were not subject to consultation with the representatives of neighbours, the European Commission, regional and local levels of public administration or other social partners such as entrepreneurs, who employ cross-border commuters. The interviewed experts underlined that both Polish and Czech governments have "bypassed and ignored" or "have not consulted" existing cross-border governance structures. This contributed to the fact that the specificities of border regions were not taken into consideration and the initial measures

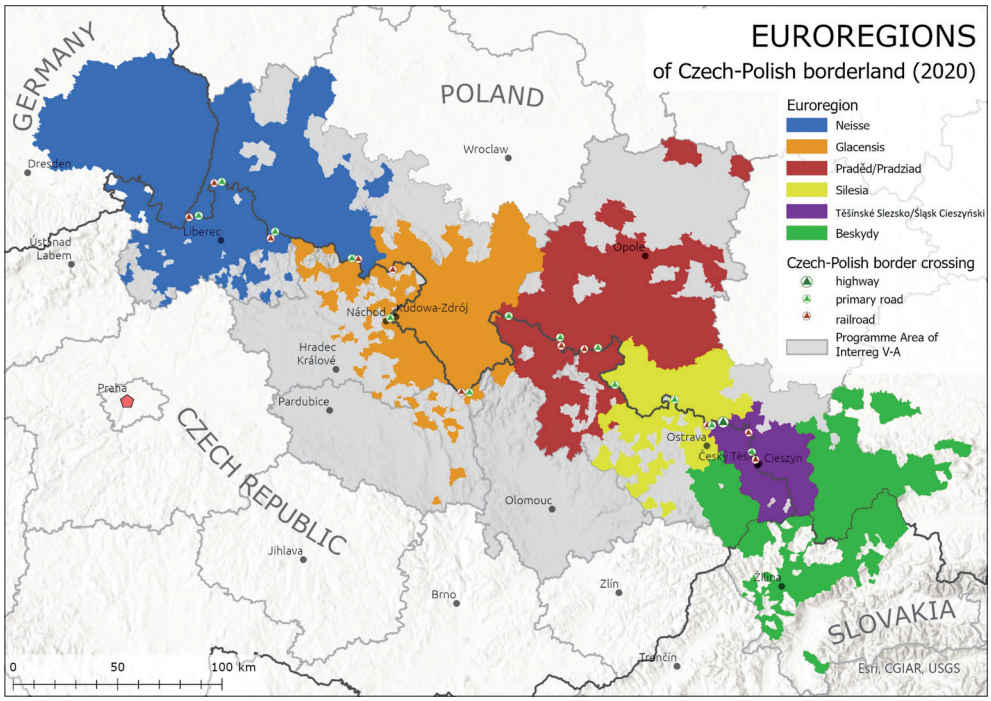

Fig. 3: Euroregions of the Czech-Polish borderland
Source: author's elaboration

[3] https://www.vlada.cz/cz/epidemie-koronaviru/dulezite-informace/prehled-vladnich-usneseni-od-vyhlaseni-nouzoveho-stavu-180608/#brezen

created substantial problems for the local economies of the borderland, which is to some limited extent also relying on cross-border flows. A good illustration of the feelings of politicians from a local level was given by Anna Hetman, the mayor of (Polish) Jastrzebie-Zdrój and a member of the Euroregion Těšínské Slezsko/Śląsk Cieszyński board:

> "…Hundreds of residents of Jastrzębie-Zdrój, who commuted daily to work in industrial plants and mines in neighbouring Czech towns, lost this opportunity overnight, and lost thus the possibility of earning, often the only family income. I fully understand the extraordinary and unprecedented situation in which we find ourselves and the resulting concern for the best security of our country. However, it must not be at the expense of cross-border commuters, who have to choose between a job in the Czech Republic without a chance to live a normal family life or losing the only family income. Leaving them only one day to make such an important decision is not acceptable. Moreover, in comparison to the locals employed in Poland, who receive social benefits while being on the forced quarantine, those employed in the Czech Republic are left without any financial support" (Hetman, 2020).

Her words underlined that local authorities – mostly in Euroregions – were forced to react to these unilaterally taken decisions and their influence on the group of cross-border commuters to protect their rights, as detailed in the next subsection.

4.1.2 The limitations of cross-border flows damage local economies of the Czech-Polish borderland

Before the pandemic started, some 48,000 people were benefitting from the advantages of the Czech-Polish cross-border labour market – mainly Poles, who worked in Czech enterprises (Kasperek and Olszewski, 2020). The pandemic restricted free cross-border flows and complicated the functioning of local economies in the Czech-Polish borderland. This was mainly due to the Polish government, which introduced (27 March, 2020) an obligatory two weeks quarantine for Poles returning home from abroad, which also applied to the cross-border commuters. This led to two principal reactions: one group of Polish cross-border commuters decided to stay at work in the Czech Republic, found accommodation there and was practically separated from their families. The other group decided to stay home and resigned on the whole or part of their income, which on the other hand caused significant difficulties for their Czech employers. The pandemic caused the most substantial problem for the less qualified workforce employed in the manufacturing industry, as these employees are often the only breadwinners of their families (Kasperek and Olszewski, 2020).

Moreover, these cross-border commuters organised demonstrations against the restrictions. They took place mainly in both the Czech and the Polish part of the divided town of Český Těšín/Cieszyn – where the highest levels of mutual interactions are observed (Pászto et al, 2019; Böhm and Opioła, 2019) – and we can even talk about a cross-border functional labour market region. Such reactions were also seen in other places (such as Náchod/Kudowa-Zdrój).

Euroregions where cross-border commuting had been strongly present, started to act as advocates of cross-border commuters. They developed – with the support of other Euroregions – concentrated and partly co-ordinated efforts to change the quarantine obligation. This happened by means of letters to the Polish prime minister (and later to his Czech counterpart), which were supported by the analytical evidence elaborated by the Těšínské Slezsko/Śląsk Cieszyński Euroregion (Kasperek and Olszewski, 2020), providing further reasons to lift the quarantine obligations. Euroregions Těšínské Slezsko/Śląsk Cieszyński and Glacensis (where Poles work in the Škoda Auto factory in Kvasiny) were the most active organisations in the Czech-Polish borderland (cf. Böhm and Opioła, 2019).

As mentioned, the quarantine obligation also damaged employers: for example, the Czech textile factory JUTA was not able to manufacture an expected/contracted volume of goods due to the non-availability of the Polish workforce, who preferred to stay home in the obligatory quarantine to take care for their families, despite the employer offering to pay for their accommodation in the Czech Republic (Novinky.cz, 2020). Another practical tangible impact of the pandemic could be seen in the much lower security of companies, which deliver their services on the other side of the border. According to the interviewed experts, the provision of services of Czech companies in Poland (and the other way round) was sometimes suspended due to the border closure. It is not clear whether these companies will be exposed to sanctions for these delays, despite they were caused by vis maior. According to the interviewed experts, this might lower the willingness of companies to take part in public procurement on the other side of the national border, which contradicts the European single market principle.

4.1.3 Border closures lowered the possibility of mutual cross-border contacts and events

The border closure disabled the organisation of joint events alongside the border. The events in the divided city Český Těšín/Cieszyn were the most affected ones: the traditional "Three Brothers' Festival", annually celebrating the memory of the founders of the town, as well as joint theatre and cinema festivals, which create a flagship of similar joint activities organised in the whole Czech-Polish borderland (Zenderowski and Krycki, 2014; Boháč, 2017), had to be cancelled or moved into virtual space.

The border closure had a negative impact in managing cross-border activities along the whole border, which are often implemented as microprojects– see subsection 4.1.6. The entire people-to-people part of the INTERREG programme has helped to organise events such as joint summer camps of Czech and Polish children. Given the pandemic-related atmosphere of fear and uncertainty, those events were the first to be cancelled.

On the other hand, the border closures and related border-crossing restrictions revealed the existence of a cross-border civic society in the east of the border, in Těšínské Slezsko/Śląsk Cieszyński Euroregion. The most visible manifestation of civic society activity was the poster event: "I miss you, neighbour". The activists placed banners on railings on their side of the border river. These posters attracted substantial media attention, and not only from the Czech Republic and Poland. Stefan Mańka, co-author of the Polish banner "I miss you, Czech" and one of the interviewed CBC experts, explained that he felt an urgent need to convey a positive message to lift the mood of the locals. In the same vein, the local music band Izabel reacted to the actual situation with their song Two Banks (of one river), which calls for the immediate end of border closure and has recorded a substantial number of Youtube views.

At the end of the first pandemic wave in mid-June 2020, the Czech Republic opened its borders with all neighbours,

with one notable exception: due to the rise of the pandemic in the Polish Silesian voivodeship, the inhabitants of this region were banned from entering the Czech Republic without a quarantine for another two weeks. As this decision prolonged the separation of Cieszyn/Český Těšín, the locals from both sides of the border organised a silent protest on the border bridge to claim the return of normality – which means the open border, when Cieszyn/Český Těšín form one functional unit. This symbolic protest was led by the mayors of both towns, which underlined the meaning of the message.

4.1.4 The pandemic contributed to the re-emergence of mutual animosities

Despite all expressed mutual sympathies, the pandemic has also highlighted some animosities vis-à-vis the neighbour, which can still be found among the inhabitants of borderlands. The above-mentioned decision of the Czech government – initiated by the president of the Moravian-Silesian Region – to restrict the entry of inhabitants of (Polish) Silesian Voivodeship into the Czech territory also after 15 June 2020, due to the high occurrence of COVID-19 cases in coal mines in this voivodeship – offered fuel for those animosities. As both concerned neighbours are partner regions and the intensity of their cooperation initiatives is high (Böhm, 2018), this decision temporarily worsened continuation of their further unproblematic cooperation.

The interviewed experts underlined their reservations and even objections against the prolongation of border closures, and some of them warned that it has damaged the outcomes of mutual cross-border initiatives and re-opened mutual negative stereotypes, which were deemed to be long-forgotten (Brandys, 2020). Despite the fact that border closures were intended to be temporary, they caused major uncertainties, which stopped or at least substantially complicated the cooperation of schools. Some of them suspended all unnecessary activities, including international and cross-border cooperation and adopted the re-bordering reality quickly – and some of them even willingly. Moreover, according to the opinions of the interviewed experts, it is uncertain whether these (school) partnerships will be renewed in the post-pandemic period.

4.1.5 Economic crisis will decrease the revenues of local actors, which could limit their ability to conduct CBC

The pandemic caused the economic crisis, which will lead to decreased local and regional budgets, due to significantly lower tax revenues. Local and regional actors, who create the majority of all partners involved in CBC projects and initiatives, will moreover have to accept the strengthening of the central budget at their cost, as at least the decisions of the Czech government responding to the pandemic introduced centrally-led and implemented investments. This means that regions and municipalities will lose a substantial part of their budgetary incomes, as they have to de facto co-finance part of the COVID-19 related subsidies for entrepreneurs (Union of Czech Municipalities, 2020).

This redistribution will, according to the interviewed experts, probably exert a major negative impact also for the CBC. Municipalities and regions will have less funds at their disposal, which means that the municipalities will have to introduce austerity measures (Union of Czech Municipalities, 2020). Hence, the interviewed experts predict that all international, including cross-border cooperation, activities might be among the first victims of this expected austerity. The experts foresee that these cuts might put into question the interim cooperation achievements, which resulted from projects and long-term cross-border relationships. This can, according to these stakeholders, lead to a lower number of cross-border initiatives and a lower number of actors involved in the activities and structures of Euroregions and other cross-border entities. Some of the current cooperation stakeholders even expect that the CBC will be understood as an expendable luxury, which will only be realised in the traditional "fortresses", such as divided towns Cieszyn/Český Těšín or very close neighbours, for example Náchod-Kudowa Zdrój.

4.1.6 The implementation of INTERREG-funded projects was substantially complicated

All interviewed experts have been involved in managing INTERREG-funded projects. Moreover, the representatives of Euroregions are responsible for the complex management of microprojects – the subtle people-to-people initiatives of a mostly non-investment nature, encouraging the cross-border contacts. In the Czech-Polish borderland, each of six Euroregions (Nisa/Nysa, Glacensis, Praděd/Pradziad, Silesia, Těšínské Slezsko/Śląsk Cieszyński and Beskydy/Beskidy: see Fig. 3) organises their calls for microprojects, evaluates and selects them. The €45 million for microprojects represents 20% of the INTERREG CZ-PL programme allocation (INTERREG, 2015). Microprojects have helped to organise many cultural, sporting and tourist events and provided an opportunity of meeting for the inhabitants of the borderland, as well as for tourists from outside the region (Dołzbłasz, 2013).

The border closures have negatively influenced or disabled the implementation of joint cross-border initiatives, very often co-financed from the INTERREG programme. The interviewed representatives of Euroregions, who administer the use of microprojects in their territories, underlined that the realisers of microprojects asked for modifications and prolongations of their projects under implementation, as not all of them could be done in virtual space. Moreover, they expressed their concern that the number of new microprojects will decrease in the coming years.

All other interviewed experts (those who did not represent Euroregions) implement INTERREG-funded projects. They underlined the unique position of the INTERREG programme and stressed the impossibility to implement projects, which should assist in removing the barrier function of the border, without the possibility to meet physically. This might lead to a dramatic decrease of newly prepared projects.

4.2 The impact of border closures on cross-border cooperation roles

In this Section we examine the above identified pandemic impacts on the five roles of CBC in the Czech-Polish borderland. We used a rating scale, where we asked the interviewed experts to sort these impacts according to their importance. A five to one scale was used, where 5 stands for the highest impact and 1 for the least impact. The goal of this section is twofold: given the ranking exercise, which CBC role was the most affected by the border closures; and we also verify whether this "five roles" concept can be used to study CBC at all.

According to the opinions of interviewed experts, presented in Table 1, the pandemic had its most serious impact on the role of CBC in regional development. This illustrates that the level of cross-border economic integration is rather high in the Czech-Polish borderland – which was partly

expected in Těšínské Slezsko/Śląsk Cieszyński Euroregion, but according to the interviews and analysed texts it is also the case for the rest of the borderlands. This means that the level of cross-border integration in some parts of the "new EU" can be similarly as high as in the "old EU" and it can be – as it is for example in the German-Polish borderland – considered the main co-operation engine (Jańczak, 2020).

Our research outcomes also underlined the fact that stakeholders in the Czech-Polish CBC activities consider their involvement as an integral and important part of European integration processes. The ideational level of CBC is thus important in the Czech-Polish borderland – and the interviewed experts stressed that they have attempted to underline this European integration dimension during the pandemic times.

Thus, the impact of the pandemic has been so far more serious on functional (regional development) and ideational (European integration, post-conflict reconciliation) CBC dimensions than on institutional ones. Para-diplomacy was the area where the pandemic impact was the least severe – at least in a comparative perspective, as one of the interviewed experts put it: "I think that the pandemic will, due to the lower amount of funds available for CBC, have a very negative impact on the para-diplomacy, as municipalities will have less funds to implement their projects. We can observe it already now, as the number of microprojects asking for the INTERREG financing decreased remarkably. However, the impact on European integration and cross-border economy will generally be more devastating…".

Table 1 also reveals limitations of the use of the five-roles concept, as well as the rating scale method. These shortcomings imply that the pandemic has impacted the CBC in its multi-level governance role less than in its other roles, save for the case of para-diplomacy. This would be a misinterpretation, as some of the interviewed experts underlined that this multi-level governance role "overlaps with the European integration role" or "creates a substantial part".

5. Conclusions and recommendations

The COVID-19 pandemic has challenged EU fundamental freedoms in very complex ways (Unfried, 2020). Its consequences have been negative, mainly in the border regions (Klatt, 2020). Therefore, the main goal of this article was to assess the impacts of the COVID-19 pandemic on Czech-Polish CBC. We hypothesised that those impacts substantially complicate cooperation. We also wanted to find out whether we can expect a rise of re-bordering trends in this case study territory in a longer-term perspective.

The article should have shown whether the impact of the pandemic could be studied according to the five roles of CBC: 1) multi-level governance; 2) regional development; 3) para-diplomacy; 4) reconciliation; and 5) European integration. In this research project, it appeared to be a useful tool, because it helped to structure the organisation of the focus group, as five pre-defined questions/CBC roles substantially created the formulation of the impacts and consequences of the pandemic on the Czech-Polish CBC. As the concept has its limitations, mainly in the mutual overlap of the five roles, its further use should be verified in other borders and under "non-emergency" conditions.

The immediate pandemic-related re-bordering has had six principal impacts in the Czech-Polish borderland. The national governments decided to close the border and bypassed the existing cross-border governance structures. This immediately restricted cross-border flows and damaged economic development in the Czech-Polish borderland. Principally, Polish cross-border commuters and their employers (based in the Czech Republic) were impacted. The restricted border crossing lowered the number and intensity of cross-border contacts. It also contributed to the re-emergence of mutual animosities, as the act of border closures indicated that potential danger (infection) might come from the neighbours. The pandemic caused an economic crisis, which will decrease the incomes of local public actors, who could in some cases resign from CBC or restrict it. The implementation of INTERREG-funded projects was hugely complicated or disabled.

Some principal CBC stakeholders, cross-border commuters, entrepreneurs benefitting from the cross-border complementarities, also cross-border civic society, reacted actively against this re-bordering. The sudden interruption of the narrative of open borders and resignation from mutual interdependencies showed that free border crossing is considered to be a norm in the Czech-Polish borderland. The intensity of market-driven cross-border flows, based on cross-border commuting, is the main cross-border integration driver in the Czech-Polish borderland. In the east of the border, we have also observed an existing cross-border civic society, which raised its voice against re-bordering strongly.

The first pandemic wave also showed that the Czech-Polish borderland is very heterogeneous. Future re-bordering processes are likely, but they will differ regionally. Our findings showed that Těšínské Slezsko/Śląsk Cieszyński Euroregion is the most integrated part of the borderland (as stated by Pásztó et al., 2019). It was capable of reacting to the pandemic and the high level of cross-border integration is considered to be a norm there. This was manifested by the repeated protests against the closed border, expressions of mutual sympathies vis-à-vis the neighbour led by civic society, and in the steps of the secretariat of the Euroregion, which – acting on behalf of all Polish Euroregions – helped to persuade the Polish government to ease the quarantine obligation for Polish cross-border commuters by the means of successful deliberation (Kasperek and Olszewski, 2020). In other Euroregions, cross-border labour market integration could prevent or slow down the re-bordering processes, yet the absence/low presence of existing cross-border civic society will make this task more complicated. The presence of a cross-border civic society is an important factor preventing re-bordering and is worthy of further investigation.

The pandemic will probably not impact institutional functions and the basic shape of cross-border governance bodies in the Czech-Polish borderland. Pandemic-related austerity measures, however, might restrict the ability and willingness of municipalities to participate in cross-border activities and governance structures, which might reduce the number of their members. The volume of submitted projects asking for INTERREG funding has decreased since the pandemic started. Moreover, this trend will continue, given the expected lower ability of municipalities and other actors to pre- and co-finance those projects. Hence, it might be worthwhile to re-think or to temporarily change the rules of this programme. Advance payments and/or a temporarily increased level of the financial support could help to increase the number of microprojects, and to assist in furthering this visible form of European integration in the border regions.

The negative effects of the pandemic on the Czech-Polish CBC calls for reactions of both CBC stakeholders and scholars. The principal challenge is the need to keep the borderline permeable to enhance cross-border flows. This asks for a special scenario of cooperation and also communication in emergency situations in the Czech-Polish border region, which would be applied in the case of repeated border closures. Such a model could eliminate the uncertainty, which has been causing similarly serious problems as the restricted borders themselves. This is a truly multi-level challenge for local and regional CBC actors, as well as for national states and European institutions.

The existence of a border-crossing scenario in emergency situations would strengthen the understanding of the Czech-Polish border region as a place for a good life (cf. Klatt, 2020). The pandemic showed that "…people living in border areas are re-shaping the European narrative of borders and especially they are the agents who make the European story through their daily life" (Medeiros et al., 2020, p. 19). This observation is valid also in the study case of the Czech-Polish borderland, given its differing intensity depending on the levels of cross-border flows. Hence, further research exploring the mid- and long-term influence of the pandemic on the quality of the Czech-Polish borderlands as a living place is needed. It will probably document a high heterogeneity and certain re-bordering tendencies in the Czech-Polish borderland, but it could also point to examples which used the pandemic as an occasion to intensify cross-border integration.

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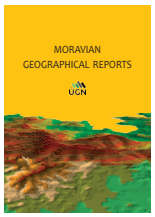

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Suburbanisation processes within and outside the city: The development of intra-urban suburbs in Wrocław, Poland

Robert SZMYTKIE [a *]

Abstract:

The scale and the specificity of intra-urban suburbanisation is subject to evaluation in this article, based on a case study of Wrocław city (SW Poland), using data on population changes at an intra-urban scale and on the level of construction activity in the city. Intra-urban suburbanisation is characterised by intensive construction activity and population growth in the peripheral districts of the city, while depopulation takes place in the central part of the city and in large panel block estates from the socialist period. The main factors for the development of intra-urban suburbanisation are a reaction to the unfavourable (from the perspective of the city) suburbanisation processes (outflow of residents and tax revenue, road traffic congestion and the necessity to service populations residing de facto outside the city). The existence of extensive non-urbanised areas within the larger cities of Central and Eastern Europe (identified as potential areas for investment) results from the specific nature of their territorial development in the 20th century, including incorporation processes connected with planned urbanisation.

Key words: *intra-urban suburbs, residential suburbanisation, population changes, Wrocław, Poland*

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1. Introduction

One of the most noticeable socio-economic processes in the post-socialist countries of Central and Eastern Europe (CEE) is the suburbanisation occurring in the surroundings of large cities. This phenomenon has been extensively described in the literature. Publications on suburbanisation in this part of Europe may be assigned to six main subjects (see Kubeš, 2013): 1) the physical spatial structure of the city and its transformations; 2) the functional spatial structure of the city and its transformation; 3) the housing structure in urban neighbourhoods in connection with changes in housing policy and the market; 4) the social spatial structure of the city and its transformation; 5) suburbanisation and urban sprawl in the near hinterland of city; and 6) urban planning and management on city territory.

Increased interest in the phenomenon of suburbanisation in post-socialist countries results primarily from the scale and dynamics of the process itself, which to some extent served to make up some of the delays about similar processes observed in Western European countries, largely over the whole post-war period (Brezdeń and Szmytkie, 2019). Thus, it may be said that in the period the development and scale of suburbanisation in Europe was strongly dependent on the political system and level of socio-economic development of individual countries, and the Iron Curtain turned out to be a barrier to the expansion of this phenomenon (Pacione, 2001; Schneider-Sliwa, 2006).

Inter alia, the political transformation of the 1990s and the connected socio-economic changes (market-oriented growth) permitted the development of residential construction and the fulfilment of citizens' individual needs, which had been stifled in the preceding period (Schneider-Sliwa, 2006; Leetmaa et al., 2009; Kubeš, 2013). The central planning system during the socialist period, with its focus on industrialisation and urbanisation, was an impediment to the development of such processes. Moreover, up to 1989, a significant part of migration was attributed to official government policies that promoted the growth of larger cities and towns to provide the necessary industrial labour force (Dawson, 1987; Sailer-Fliege, 1999, Pacione, 2001). Thus, in the post-socialist countries of CEE, the dynamic processes of urban sprawl into suburban areas started only after almost a half a century's delay (Lechman, 2005). The second phase of suburbanisation in Central and Eastern Europe led to the rapid and uncontrolled spatial growth of cities and the development of suburban zones, which was accompanied by a decline in the population in city centres and

[a] Institute of Geography and Regional Development, University of Wrocław, Wrocław, Poland (*corresponding author: R. Szmytkie, e-mail: *robert.szmytkie@uwr.edu.pl*)

migration to the suburbs (Węcławowicz, 1997; Sýkora, 1999; Lowe and Tsenkova, 2003; Hamilton et al., 2005; Nuissl and Rink, 2005, Schneider-Sliwa, 2006; Hirt and Stanilov, 2007; Martyniuk et al., 2016). In comparison, suburbanisation in this paper is understood as a stage of urban development which occurs when the inner ring or commuter belt grows at the expense of the urban core, compared to urban sprawl which is a specific morphological form of suburbanisation connected with the spread of a city into suburban areas, often without planning (see Pacione, 2001; Caves, 2005; Knox and Mc Carthy, 2005).

Research on construction activity in Wrocław (Namyślak and Sikorski, 2010; Ciok, 2017) and other large cities in Poland (Śleszyński, 2005; Kotus, 2006; Marcińczak, 2012; Stępniak and Mendel, 2013; Spórna, 2018; Szafrańska et al., 2019) indicates the presence of intensive activity not only in suburban zones, but also within large cities. Interestingly, intensive construction activity within the boundaries of large cities does not correspond to a growth of population there, at least according to official statistical data (Śleszyński, 2005; Gałka and Warych-Juras, 2018). Moreover, there are considerable differences within city space with respect to population changes, which is manifested in the decline of population in central parts, as well as growth of population in peripheral districts of the city (Spórna, 2018; Szafrańska et al., 2019), contributing to, among others, changes in population density profiles (Śleszyński, 2014). Similar processes are also observed within the administrative borders of large cities in other CEE countries (see Sýkora and Čermák, 1998; Soós and Ignits, 2003; Ira, 2003; Tosics, 2006; Banzhaf et al., 2007; Steinführer and Haase, 2007; Sýkora and Ouředníček, 2007; Wiechmann, 2008; Brade et al., 2009; Haase and Rink, 2015; Holm et al., 2015). This process can be called intra-urban suburbanisation (compare Lisowski and Grochowski, 2009; Spórna and Krzysztofik, 2020). The attention of researchers focuses primarily on 'proper' suburbanisation, and studies on intra-urban suburbanisation are very rare, especially those aimed at identifying the process itself and determining its scale and significance (see Spórna, 2018; Szafrańska et al., 2019; Spórna and Krzysztofik, 2020).

These general findings resulted in the proposed research hypothesis for this paper: for large cities in the post-socialist countries of Central and Eastern Europe, suburbanisation in suburban zones is accompanied by processes of intra-urban suburbanisation that have a similar character and intensity and occur in the peripheral and weakly urbanised districts of the city. Thus, the main objective of this study was to identify the processes of intra-urban suburbanisation based on a case study of Wrocław, using data on population changes on an intra-urban scale and on the scale of construction activity. An identification of intra-urban suburbanisation will demonstrate the complexity of socio-economic changes taking place within the city (between central and peripheral areas), and at the same time, will indicate that urban sprawl can occur not only outside the city (Champion, 2001; Bruegmann, 2006; Mace, 2009; Harris, 2010; Forsyth, 2012), but also within its administrative borders. To supplement the main objective of this study, research questions are asked concerning:

1. What is the scale and intensity of intra-urban suburbanisation compared to similar processes observed in the suburban zone;
2. What are the features of morphological changes caused by intensive construction activity in the peripheral districts of the city;
3. What are the population structures and demographic characteristics of the multi-family housing estates[1] and residential districts forming the intra-urban suburbs within the city;
4. Is there the difference between the real population of the city and population recorded in official statistics; and
5. What are the determinants of intra-urban suburbanisation in the larger cities of Central and Eastern European countries.

2. Theoretical background

In Western European countries a modern (second) phase of suburbanisation started in the 1960s, while in Central and Eastern Europe this process occurred only to a limited extent (see Tammaru, 2001; Logan, 2019). The problem in these latter countries was obtaining building loans, building plots, various official permits, building companies, craftsmen, and building materials (Kubeš, 2013). In the 1990s, however, the deregulation of development and housing policies in post-socialist countries also resulted in considerable momentum in the transformation of large cities and functional urban areas (Sailer-Fliege, 1999). In doing so, the respective development and housing policies influenced the scale and form of city-to-suburb migration (Brade et al., 2009). Like most of the reforms initiated after the collapse of the socialist system, housing reforms carried out during the 1990s by CEE countries were strongly influenced by the desire to find a radically different approach to housing, negating the principles of the former socialist system. Under these circumstances, privatisation, deregulation and cuts in state funding became the three main principles of housing reform (Hirt and Stanilov, 2007). Other factors of post-socialist urban transformation were the re-establishment of local self-government and urban planning, the return of land rent, an increase in housing costs, and the promotion of private or social rented housing (Sailer-Fliege, 1999). The first decade of transition in the 1990s was characterised by inflows of investment into city centres, especially in the early-reforming countries, triggering a decline in their residential function amidst substantial commercialisation and physical upgrading. This was followed by a process of decentralisation, as investments flowed to both out-of-centre and suburban locations (Sýkora and Ouředníček, 2007).

Residential suburbanisation is the relocation of the population from the core city to new housing developments in the suburban zone. It has a dual impact on both the target localities (suburbs) and sources of migration (inner city, large housing estates from socialist period) (Ouředníček, 2007). Residential suburbanisation contributes the spatial deconcentration of housing developments and changes in the number and density of the population (Spórna and Krzysztofik, 2020). The process of suburbanisation is connected to the development of new settlement structures in the suburban zone of a city. New developing areas might be concentrated around the compact town, but also individually scattered in many small localities and rural settlements in the wider surroundings of a city. Thus it is a development of residential and commercial areas at the expense of agriculture

[1] Housing estate is an area containing a large number of houses or apartments built close together at the same time (dictionary.cambridge.org).

or unused land (greenfields). New residential districts and reconstructed village properties are accompanied by shopping centres, warehousing and industrial zones (Sýkora, 1999; Matlovič and Sedláková, 2007).

From a morphological point of view, suburbanisation is connected with the process of selective or even the so-called leap-frog development (Matlovič and Sedláková, 2007). Mantey and Sudra (2019) distinguished 16 types of residential suburbs in post-socialist countries, which shows the complexity of suburban sprawl there. An important factor stimulating suburban development is the lower cost of land and, from the developers' point of view, undemanding project approval requirements of local self-government authorities (Sýkora, 2001). Some other important factors that determine the processes of suburbanisation are changes in value orientations concerning the residences of upper middle-class households, and the development of individual motorisation (Matlovič and Sedláková, 2007), so that, accessibility to roads promotes sprawl and influences the development of cities (Baum-Snow, 2007; Garcia-López et al., 2015).

During the socialist period, the new subsidised and standardised apartments in the cities were a relatively highly valued segment of the housing market (Rykiel, 1984), and they tended to be inhabited by people with higher social status (Kulu, 2003). In contrast, unsubsidised single-family houses in the suburbs often lacked modern facilities and housed the urban workforce, who did not have access to urban housing because they worked in non-priority sector enterprises (Andrusz et al., 1996). Since 1989, suburban communities in Poland emerged largely at random and included two types of residents: (a) affluent families that wished to have more space and amenities than what cooperative housing in large cities could offer; (b) middle-class citizens who built their own homes using their personal savings and the help of friends and family (Zębik, 2011). Suburbanisation has become one of the most visible features of the process of spatial restructuring, rearranging the urban patterns of the post-socialist city (Leetmaa et al., 2009). In part, this is because deconcentration of the population results from the growing popularity of environmental reasons for migration. Kontuly and Geyer (2003) asserted that poor people tend to migrate to stronger economic centres (supporting urbanisation), while wealthier people prefer the environmental quality of smaller settlements (supporting counter- or suburbanisation). Another important social factor determining the progress of suburbanisation is the change in the lifestyle of urban residents and the desire to live in a house with a private yard – the famed 'American Dream' (Beauregard, 2006).

On the regional scale, suburbanisation is manifested in depopulation or population stagnation in the agglomeration core (core city) and in a growth of population in its suburban zone, which is caused mainly by an inflow of migrants from the city (Musil, 1993; Sýkora, 1999; Timar and Varadi, 2001; Hamilton et al., 2005; Śleszyński, 2005; Bruegmann, 2006; Schneider-Sliwa, 2006; Sýkora and Ouředníček, 2007; Hirt and Stanilov, 2009; Sýkora and Bouzarovski, 2012; Schmidt et al., 2015; Mantey and Sudra, 2018). Research on changes in intra-urban spatial structures conducted in large urban agglomerations of Central and Eastern Europe have shown such tendencies:

- in the case of Prague: decline of the population in most areas in the inner city and increase of the population in the majority of suburban boroughs and municipalities (outside the compact city); the growth of population is concentrated in areas with the best natural environment and good transport accessibility (Sýkora and Ouředníček, 2007), while a considerable amount of post-1989 single-family detached housing can be found within the outer band of the territory of the city (16.7%) (Stanilov and Sýkora, 2012);
- in Budapest: the rate of urban expansion in the core city was 7.6%, which concerned peripheral areas located near the administrative borders of the city (Kovács et al., 2019);
- for the Katowice conurbation: depopulation processes in the downtown areas of cities and in areas with dominant multi-storey buildings from the socialist period (constructed from pre-fabricated elements), and growth in the number of inhabitants in several zones, including: the surroundings of the most invested-in areas of cities (city centres), but still within their administrative borders, including the city borders with surrounding rural areas; unused areas in the close vicinity to city centres, and polycentric areas of wasteland (post-industrial areas, post-agricultural areas) (Spórna, 2018); construction traffic in the Katowice conurbation in the years 2000–2017 indicates the initiation and development of 'classic' suburbanisation processes in the outer zone of the agglomeration, and of 'inner' suburbanisation in the conurbation core (Spórna and Krzysztofik, 2020);
- in the case of Łódź: population loss in areas with a high percentage of low quality, standard, old housing resources and areas of blocks of flats built in the 1950s and 1960s, and population increase in new residential areas in the outer zones of the city, which is the result of the outward migration to newly-built, detached single-family houses (Szafrańska et al., 2019);
- finally, for Warsaw: intensive construction activity in the peripheral districts of the city; these sub-central and peripheral investments were often large-scale residential districts that consumed large amounts of land, often including internal road infrastructure on a private estate that locked out outsiders and has no connection to its immediate surroundings (Stępniak and Mendel, 2013).

In Poland, as a result of the significant territorial expansion of large cities during the socialist period (Szymańska et al., 2009, Szmytkie and Krzysztofik, 2019), city limits encompass former suburbs as well as large swaths of undeveloped land. This creates a fundamental problem when attempting to define 'the suburbs' in Poland (Zębik, 2011): peripheral zones of large cities in which growth in population and intensive construction activity occurred, are called 'inner city' suburban zones (Spórna, 2018) or the inner suburbs (Szafrańska et al., 2019, Spórna and Krzysztofik, 2020) in the literature. Some similar terms, 'inner suburb' or 'inner-ring suburb', may be found in British and American literature on the subject (Hanlon, 2010). Such developments, however, mainly refer to suburban areas that existed in the Victorian era and to inter-war suburbanisation. These suburbs, formed of semi-detached houses, were established in the immediate vicinity of the cities, forming their outer ring (Frey et al., 2006; Mace, 2009) and, in the course of the territorial development of the city, have become their most inherent parts (Whitehand and Carr, 2001). The dynamic territorial expansion of cities in the 19th and 20th century, by incorporation of the surrounding areas (formal extension of city boundaries), which was typical for CEE cities, contributed to the formation of 'suburbs within the city' (Jindrich, 2012; Szmytkie, 2019; Szmytkie and Krzysztofik, 2019).

According to Spórna and Krzysztofik (2020), intra-urban suburbanisation may be interpreted in two ways: 1) as the growth of single-family housing estates (by individuals and by property developers) within formal city limits; or 2) such development may be identified within the real urbanised (core) area of a city or urban agglomeration. In the first case, 'inner' city suburbanisation has the characteristics of 'classical' suburbanisation that occurs within formally drawn city boundaries. In the second case, inner suburbs are identified as an enclave of low-rise buildings located in the surroundings of an existing urbanised area of a town. In the case of neighbouring towns, 'inner' suburbanisation develops between urbanised zones shaped in both urban centres and is closely connected to the occurrence of non-urbanised areas.

In this study, due to the different (monocentric) spatial structure of the Wrocław agglomeration and the character of the territorial expansion of the city (see Szmytkie, 2019), intra-urban suburbanisation is understood as the development of peripheral zones of the city, associated with the influx of migrants to the area and intense construction activity.

In such an interpretation, the process of intra-urban suburbanisation involves movements of the population in the search of more comfortable residential conditions, and the migrations have an internal character, i.e. they occur within the administrative borders of the city. The target of intra-urban migration is usually areas that are free from any investments (greenfields) (Koman, 2017). An increase in population density in these areas derives from new housing investments, both private and constructed by developers (Spórna, 2018). Housing construction in the area of intra-urban suburbs is spontaneous, uncontrolled and focused on greenfield areas (agriculture land), often unrelated to the existing development, similar to classic suburbanisation occurring outside the city. According to Spórna and Krzysztofik (2020), two conditions distinguish such intra-urban suburbanisation from typical suburbanisation or reurbanisation: 1) the location of new residential investments (within the administrative boundaries of a city and on already urbanised areas or between them); and 2) the physiognomy of the new developments (detached, semi-detached and terraced housing). A separate factor that distinguishes intra-urban suburbanisation results from the issue of retaining the population within the city borders (in that the local scale migration is internal not external or outside the city), and the direction of migration (from the city centre to its periphery).

3. Data and methods

The research procedures adopted for the needs of this study may be divided into several key stages, differing with respect to the level of detail of the analyses conducted. The initial stage of research included identification of the (sub)urbanisation processes around Wrocław, which in the post-war period was subject to processes typical for cities in post-socialist countries of CEE (urbanisation and industrialisation in the socialist period until 1989, and suburbanisation in the post-socialist period). This analysis places a particular focus on investigating the trends in population changes typical for both sub-periods distinguished, occurring in Wrocław and its suburban zone. At this stage of the research, official statistical data on population and basic factors of population change from Statistics Poland (natural change, migration) were used. The study area (the Wrocław agglomeration) was divided into three main parts:

1. The city (the core of the agglomeration and intra-urban suburbs);

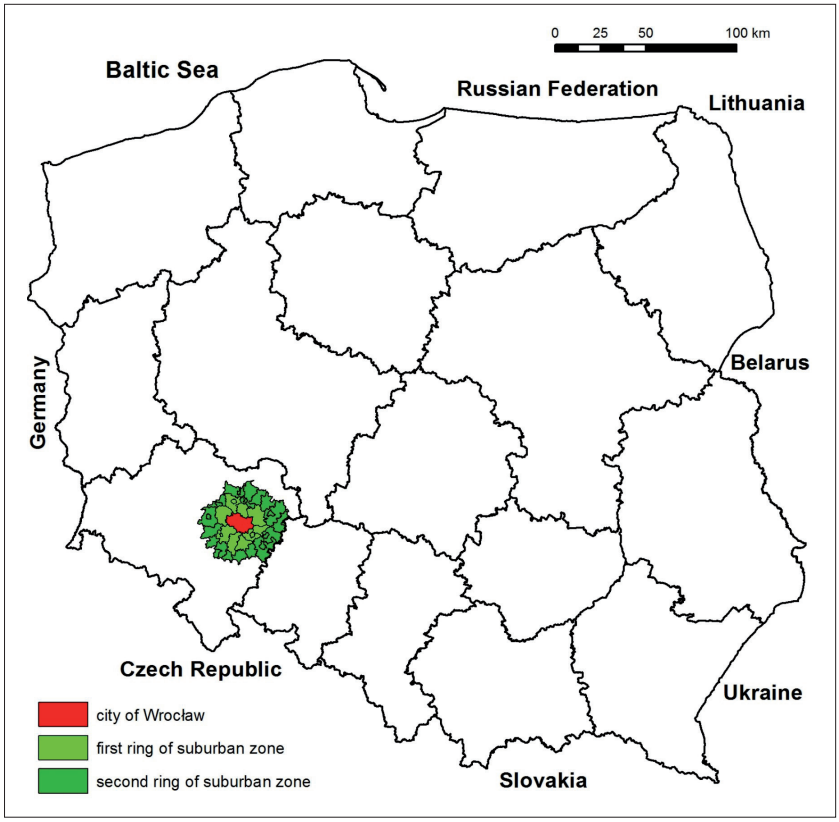

Fig. 1: Location of the Wrocław Urban Region within Poland
Source: author's elaboration

2. The first ring of municipalities covering units directly bordering the city; and
3. The second ring of municipalities covering the units directly bordering the first ring (see Fig. 1: Brezdeń and Szmytkie, 2019).

The second stage of the project involved the analysis of contemporary changes in population with respect to urban units (city districts) in Wrocław, for which data from the City Office in Wrocław for the years 2000–2016 were used. In this case, the time range of the analysis resulted from the availability of statistical data. This made it possible, however, to establish the differences in trends in population changes within city borders and to identify the phenomenon of intra-urban suburbanisation. To confirm the premise, data on construction activity in Wrocław (dwellings completed in the years 2000–2016), as well as an analysis of cartographic materials (topographic maps and satellite images from this period) were used, allowing the identification of morphological (spatial) changes that the peripheral districts of the city were currently undergoing. Peripheral districts include settlements incorporated into the city in the interwar and post-war period, as the city border from 1924 coincides with the compact urbanised area (urban core) (Szmytkie, 2019). The cartographic analysis included an identification of the character of the building development and its basic morphometric parameters, such as street layout, size of street blocks, size and distribution of plots, etc.

The last stage of this research project involved case studies. Its aim was to identify the population structure and demographic characteristics of residential districts constituting intra-urban suburbs within Wrocław, for which detailed address data from the PESEL[2] database on population and structure by sex and age for the years 2000–2016 were used[3]. The data were obtained from the resources of the Ministry of Digitisation, and their time scope corresponds to the data provided by the City Office in Wrocław. The case studies were conducted in five selected residential estates located in the peripheral zone of the city and built in the years 2000–2010, representing typical forms of modern residential development in Wrocław. This study covered three examples of multi-family housing estates built by development companies: 1) the estate at Żernicka Street (Żerniki); 2) Jagodno; and 3) the Lawendowe and Cynamonowe estates (Lipa Piotrowska); one example of a communal multi-family housing estate built at the initiative of the municipal self-government: 4) the estate at Wojanowska Street (Stabłowice); and an example of an estate built by a development company with single-family housing: 5) the Malownicze estate (Marszowice) (Fig. 2).[4]

Moreover, in order to answer one of the research questions, a survey was conducted in the housing estate at Żernicka Street. The survey was carried out in June 2018 and its aim was to identify the actual number of people living in the estate, which made it possible to compare it with the

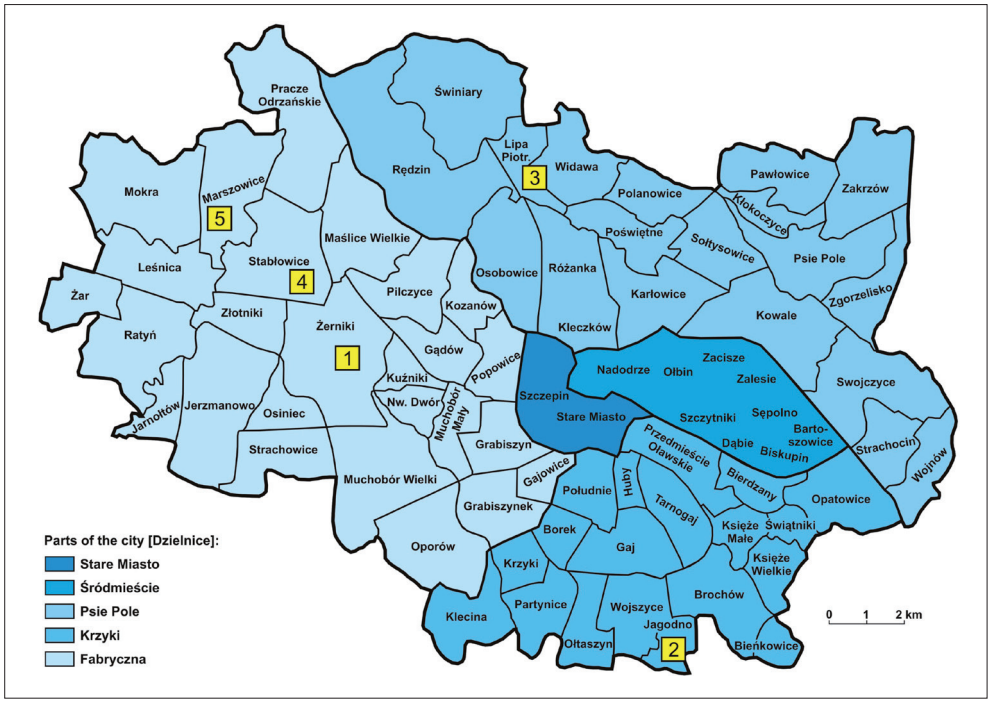

Fig. 2: Location of housing estates or residential districts mentioned in the text (Legend: 1 – the estate at Żernicka Street (Żerniki), 2 – Jagodno, 3 – the Lawendowe and Cynamonowe estates (Lipa Piotrowska), 4 – the estate at Wojanowska Street (Stabłowice), 5 – the Malownicze estate (Marszowice). Source: author's elaboration

[2] Universal Electronic System for Population Records (PESEL) is a central data set maintained in Poland by the minister responsible for computerisation under the Act on population registration. The register is used to collect basic information identifying the identity, administrative and legal status of Polish citizens and foreigners residing in the territory of the Republic of Poland.

[3] In the case of Poland, statistical data on an annual basis are published only for communes. Data on population for individual settlements or urban units (parts of cities) are published only on the basis of National Censuses or can be purchased from the PESEL database.

[4] Such a selection of housing estates was dictated by the specific nature of residential development in the intra-urban suburb zone in Wrocław, where multi-family housing estates built by development companies prevail, while in the suburban zone, single-family residential districts built by development companies dominate.

number of people reported for this estate in official statistics. The surveys also touched on: education and occupation of estate residents, previous place of residence and factors that contributed to their moving to the estate. Sixty-five percent of the adult residents of the housing estate (70 people) took part in the survey. The questionnaires was distributed to all residents of the estate, however, not all of them returned the completed questionnaire to the given address.

4. Results

4.1 Suburbanisation processes around Wrocław

Wrocław is undergoing one of the most intensive suburbanisation processes in Poland (Śleszyński, 2006, 2013). The characteristics of suburbanisation as observed in Wrocław may be depicted as follows. The number of the residents of the city grew uninterruptedly after 1945, which was caused by the planned industrialisation and urbanisation of the country, and achieved a maximum of population at the start of the period of socio-economic transformation (in the case of Wrocław this happened in 1991, when the city reached 643.6 thousand residents) (Książek and Suszczewicz, 2017). From this point on, according to official statistical data, the number of the residents of the city stabilised at the level of 630–640 thousand (Bagińska and Szmytkie, 2005) and currently (2017), Wrocław is inhabited by 638.6 thousand persons. Until the start of the 21st century, the suburban zone was characterised by a stable, slight growth of its population, caused in particular by positive natural growth. In 1980 the ring of communes surrounding Wrocław was inhabited by 98.0 thousand people, in 1990, by 104.2 thousand and in 2000, by 111.4 thousand. With the start of the 21st century, the dynamics of population growth in the suburban zone accelerated significantly. In 2010 the communes around Wrocław were inhabited by 140.6 thousand, and in 2017 by 167.4 thousand. The main factor of population changes in the suburban zone is currently a positive balance of migration, which has been at a level of over 20.0‰ annually since 2006. Furthermore, the inflow of population to the suburban zone results in a rejuvenation of population structures and contributes to the stable growth of natural increase. In recent years also the demographic situation of Wrocław has improved, and is currently characterised by a positive balance of migration and natural increase (see Fig. 3). The dynamics of population change in suburban zone of Wrocław, however, is quite varied spatially (Fig. 4).

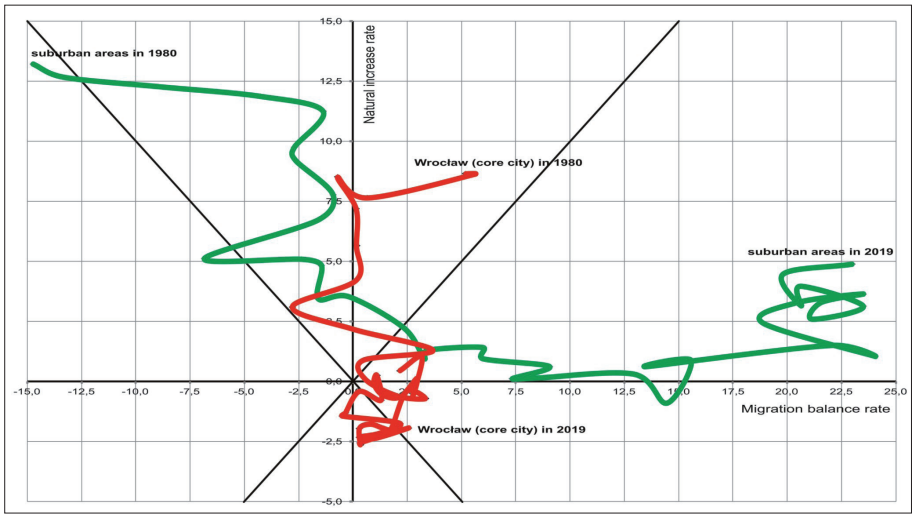

Fig. 3: Factors of population changes in Wrocław and its suburban areas (1980–2017)
Source: author's elaboration based on Local Data Bank (Statistics Poland)

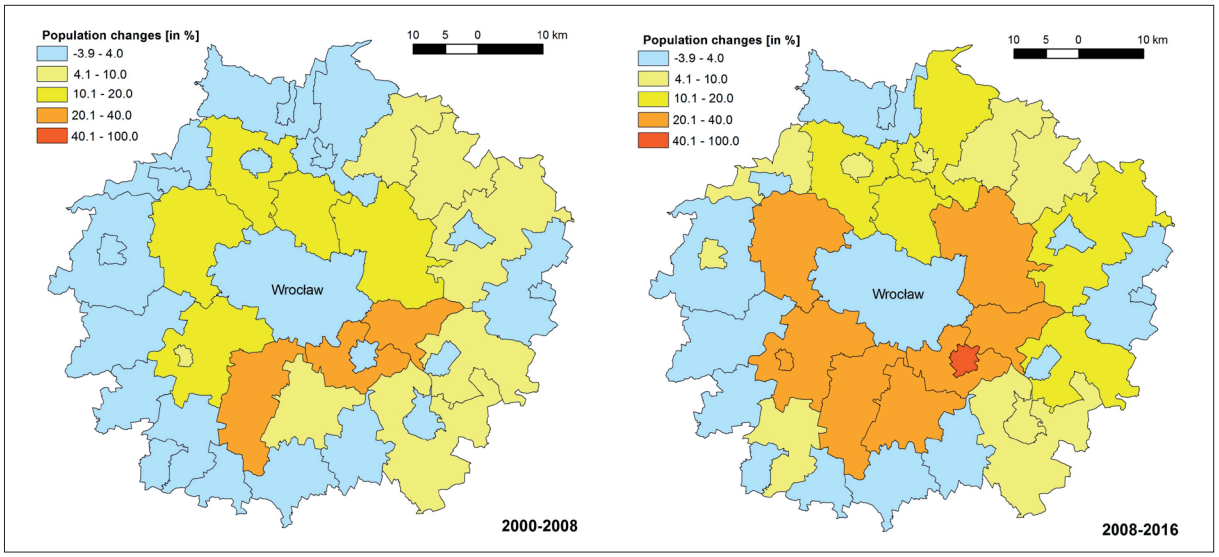

Fig. 4: Population changes in Wrocław and its suburban areas (2000–2016)
Source: author's elaboration based on Local Data Bank (Statistics Poland)

In the years 2000–2008, the greatest increase in population (over 20%) occurred in communes neighbouring Wrocław to the SE, and in the remaining communes of the first ring the increase in resident numbers was at a level of 4 to 20%. In total, in 2000–2008 the communes of the first ring recorded population growth of 14.7%, and communes of the second ring, of 1.2%. In the years 2008–2016 the increase of population was over 20% in practically all communes of the first ring. Moreover, the number of communes in the second ring which noted a significant increase in number of inhabitants (over 4%) grew from 4 to 12, which indicates an increasing growth rate of suburbanisation processes around Wrocław. In the years 2008–2016, the communes of the first ring recorded population growth of 27.1%, and communes of the second ring 4.0%. Analysis of population changes with respect to settlements in the years 1988–2011 additionally indicates a relationship between the scale of suburbanisation and transport accessibility (see Fig. 5). The highest population growth occurs in localities that are easily accessible from the city. This is clearly visible in Figure 6 representing the relationship between the change in population and distance needed to reach downtown Wrocław.

4.2 Intra-urban suburbanisation in Wrocław

In the case of Wrocław (as well as other large cities of Central and Eastern Europe), the claim that demographic development is stagnant does not reflect the real demographic situation in that area, as it is highly varied. Namely, an analysis of population changes with respect to urban units (city districts) in Wrocław for the period 2000–2016 indicates that in different parts of the city, different trends in demographic change were present (see Fig. 7).

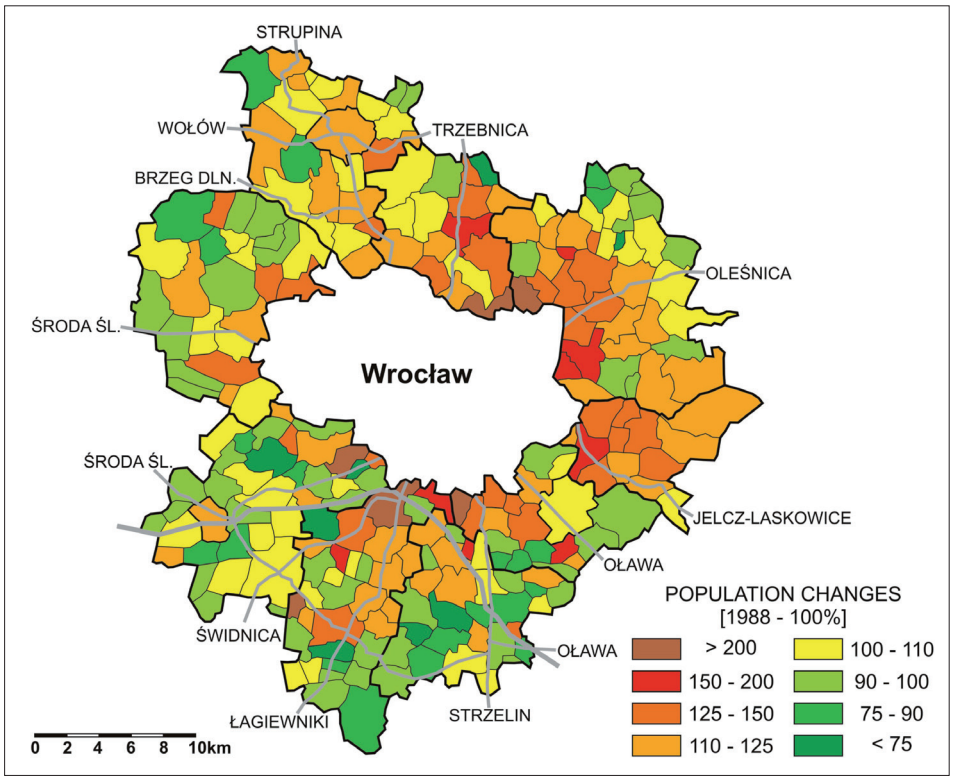

Fig. 5: Population changes in the settlements of the first ring of communes surrounding Wrocław (1988–2016)
Source: author's elaboration based on Local Data Bank (Statistics Poland)

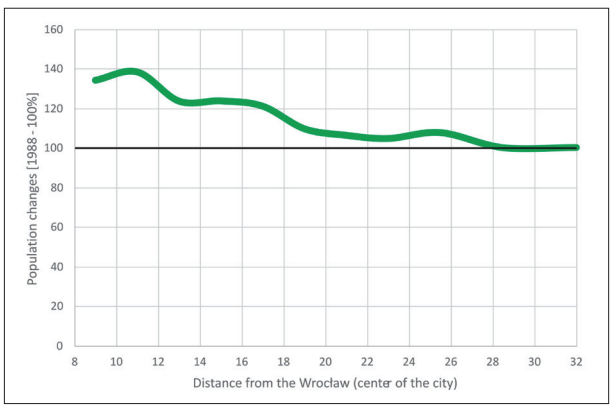

Fig. 6: Correlation between population changes in suburban areas of Wrocław (1988–2016) and distance from the city centre
Source: author's elaboration based on Local Data Bank (Statistics Poland)

The central part of the city (Stare Miasto [Old City], Śródmieście [Downtown]), the districts surrounding the centre and the large panel block estates, are characterised by decline or stagnation of their populations, while in peripheral districts (southern, western and northern edges of the city) the number of residents is increasing. Furthermore, in the case of most districts of the city, the increase in population is constant, and its intensity is comparable with the increase in population observed in the first ring of communes in the suburban zone (Fig. 5). This kind of duality with respect to demographic changes within city borders contributes to significant changes in the distribution and structure of population in the relationship between the centre and peripheral districts of the city, and also to significant changes within city space, particularly as regards morphology.

In the case of spatial distribution, the process of population deconcentration is ongoing, involving a constant growth of population density in peripheral districts. Only in the

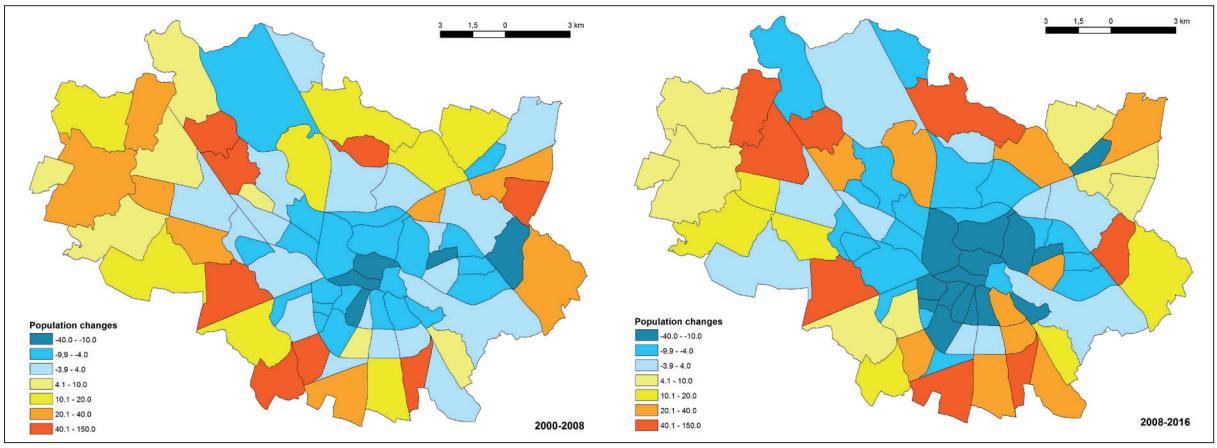

Fig. 7: Population changes in the city districts of Wrocław (2000–2016)
Source: author's elaboration based on Wrocław Spatial Information System data

years 2000–2016, city areas covering the peripheral districts of the city recorded a growth in population density of 125 persons per km^2 (3.9%): in the case of the Krzyki, of 86 persons per km^2 (5.1%); in the case of the Fabryczna; and of 116 persons per km^2 in the case of the Psie Pole. Meanwhile, in the central part of the city an outflow of residents is taking place (of 23.9% in the Stare Miasto and 17.1 % in the Śródmieście), resulting in a fall in the number of permanent residents (but not necessarily a fall in population density in this area, which is a result of the difference between the actual number of residents and the number recorded in official statistics – this phenomenon is well illustrated by a comparison of data on the size of construction activity in the city and on population changes). With regard to changes in population structures, in peripheral districts the age structure is rejuvenated, and demographic ageing is noted in the central part of the city, which indicates that intra-urban migration is selective (Fig. 8).

Changes in morphology are connected to intensive construction activity occurring in peripheral districts of the city. In the years 2000–2016, 82.7 thousand of flats were commissioned within Wrocław city, 90.6% of which were in peripheral districts (Krzyki 32.6 thousand, Fabryczna 25.9 thousand, Psie Pole 16.3 thousand). Interestingly, the size of construction activity in Wrocław is far higher than in its suburban zone (construction activity in Wrocław amounted to 65.2% of the total number of dwellings completed in the Wrocław agglomeration as a whole: see Fig. 9), and the intensity of construction activity in 2016 approached values observed in the first ring of communes surrounding the city (in individual zones of the agglomeration it was: 13.3 dwellings per 1,000 residents in the case of the city, 16.6 in the case of the first ring and 4.5 in the case of the second ring of communes).

Furthermore, the intensity of construction activity in the case of the peripheral districts of Wrocław is currently even higher than in the first ring of suburban zone communes (16.7 dwellings per 1,000 residents). Also noticeable is that in the case of the first ring of the suburban zone, intensive construction activity (over 7.0 dwellings per 1,000 inhabitants

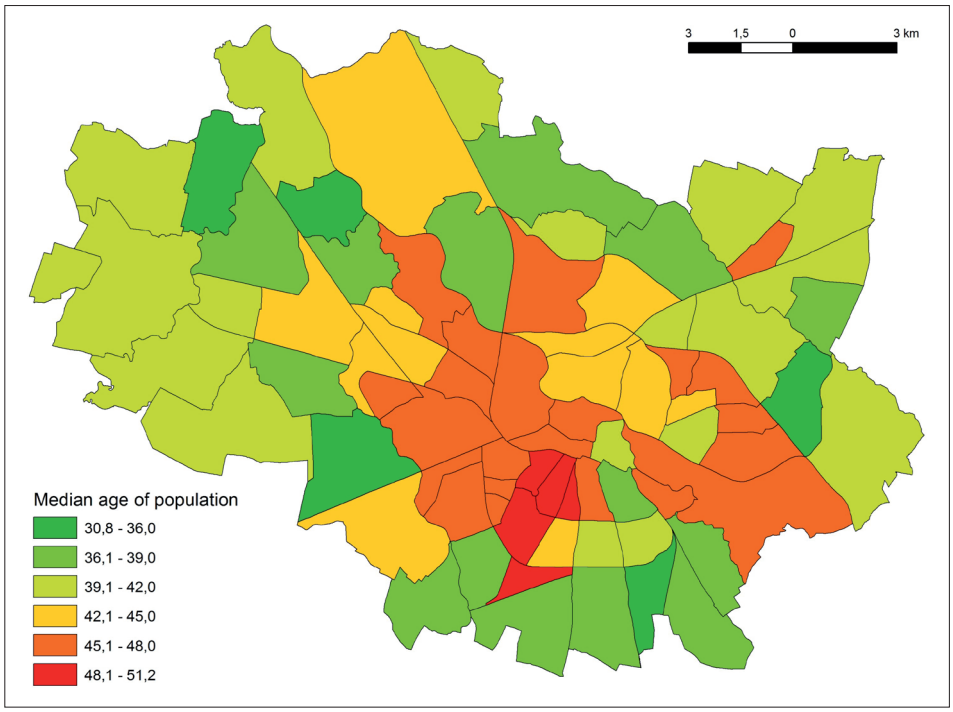

Fig. 8: Median age of population in city districts of Wrocław (2016)
Source: author's elaboration based on Wrocław Spatial Information System data

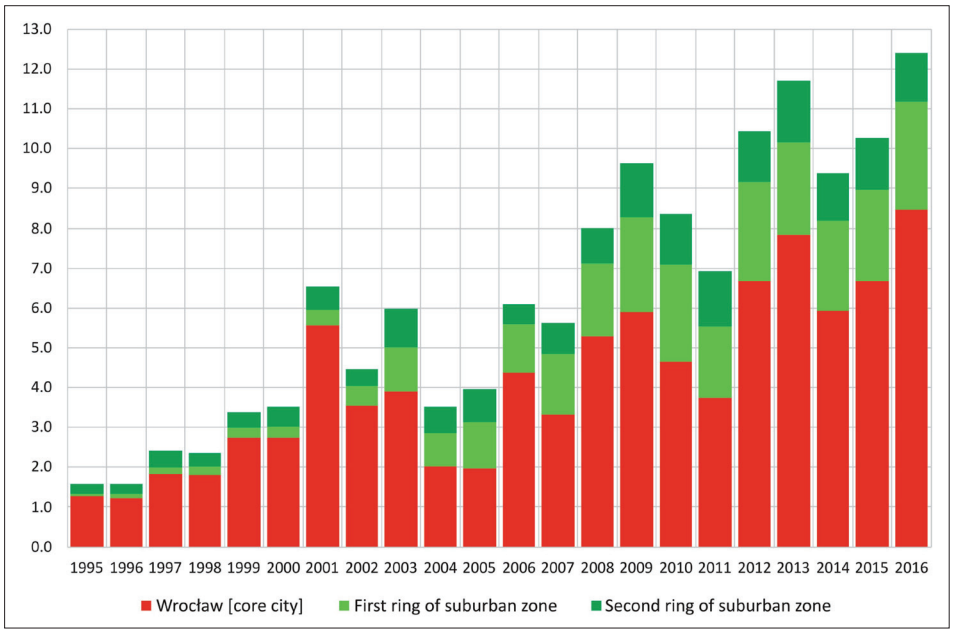

Fig. 9: Dwellings completed [in thousands] in Wrocław and its suburban areas (1995–2016)
Source: author's elaboration based on Local Data Bank (Statistics Poland)

annually) has been present since 2003, while in the case of the peripheral districts of the city, it is only since 2006, which may be interpreted as a reaction of the city to suburbanisation processes that are unfavourable to it. The size of construction activity in Wrocław in the years 2000–2016 suggests a growth of the population of the city (the growth may be estimated as some 200 to 220 thousand inhabitants[5]), while according to official statistical data in this period the population of the city lost around 2.9 thousand inhabitants. This difference results mainly from the fact that the people coming to large cities in Poland rarely register a change in official place of residence (and in the official statistics, this is shown as the population inhabiting other settlements, and not as the population of the city of actual residence).

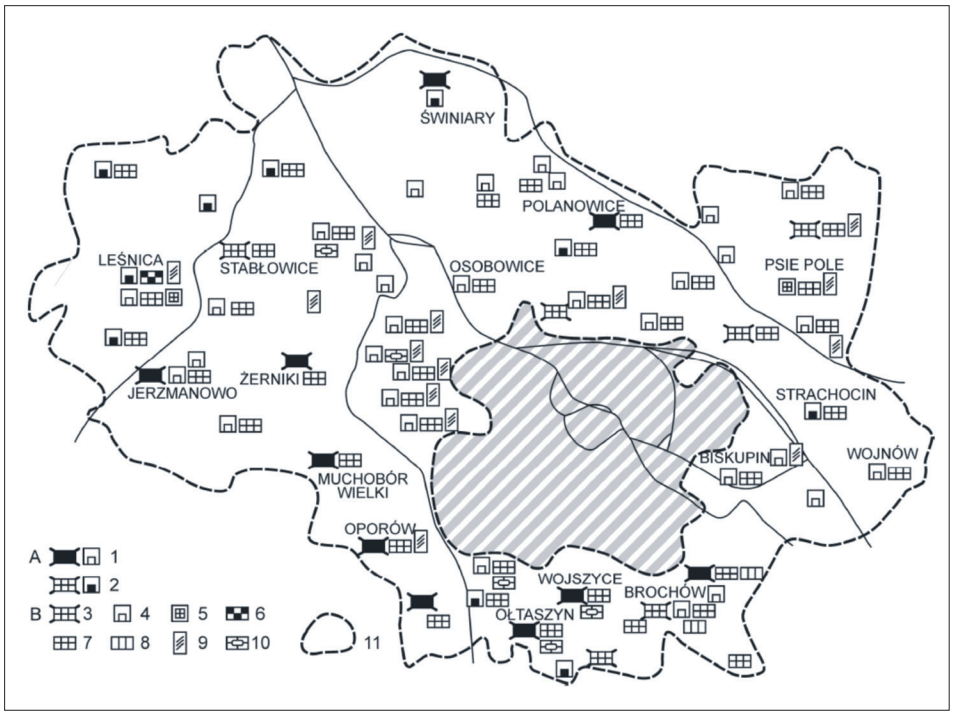

Fig. 10: Morphological transformations of the settlements incorporated into Wrocław after 1928 according to Miszewska (1996). Source: author's elaboration
Legend: A) according to the morphological structure: 1 – villages with preserved original structures; 2 – villages with a blurred structure; B) according to morphological units: 3 – street-green village; 4 – grange; 5 – rent development in incorporated towns. Villa estates: 6 – from the beginning of the 20th century, 7 – from the interwar period, 10 – post-war. Multi-family housing: 8 – terraced, 9 – modern block of flats, 11 – city border until 1928

[5] This estimate is based on the product of number of commissioned flats and the average number of persons per flat (around 2.5–2.6).

Construction activity in the peripheral districts of the city contributes to significant changes in their morphology and spatial structures. These districts grew from former villages that were incorporated into the Wrocław borders mainly as a result of the broadening of its territory in the 20th century. In the inter-war period, villa estates, or estates with terraced housing usually meant for workers, were built in place or in the neighbourhood of former villages. In the years 1945–1989 in the areas of former villages, tower block estates or villa estates were built, and contemporarily (post-1989) mainly villa or multi-family housing developments are being built there. The processes of spatial development in the peripheral zone of Wrocław city resulted in the transformation of its landscape (Miszewska, 1996) by:

1. Change in land use, which usually leads to agricultural land being pushed out from built-up areas;
2. Growth of the road network, which turned districts into morphological units with complex structures; and
3. Morphological units where initial (rural) forms are located alongside more advanced units with a (sub)urban character.

City districts of rural origin differ in the advancement of their morphological transformations, which is related to their location within city boundaries. Districts that are further away from the city centre and main transport routes were subject to far less intensive morphological transformation than districts located closer to the area of high-density developments (see Fig. 10 on previous page).

The contemporary construction activity in the peripheral parts of the city contributes to further morphological transformations in their spatial layout and physiognomy. New buildings or residential districts, consisting of detached (Fig. 11), semi-detached and terraced (Fig. 12) housing, are built mainly in areas previously used for agriculture ('greenfields'). The original rural or farm buildings are also being replaced by new multi-family buildings.

4.3 Demographic features of intra-urban suburbs in Wrocław

An analysis of the population structures in modern estates forming intra-urban suburbs in Wrocław shows certain patterns. Multi-family housing estates built by development companies are, irrespective of their size, inhabited mainly

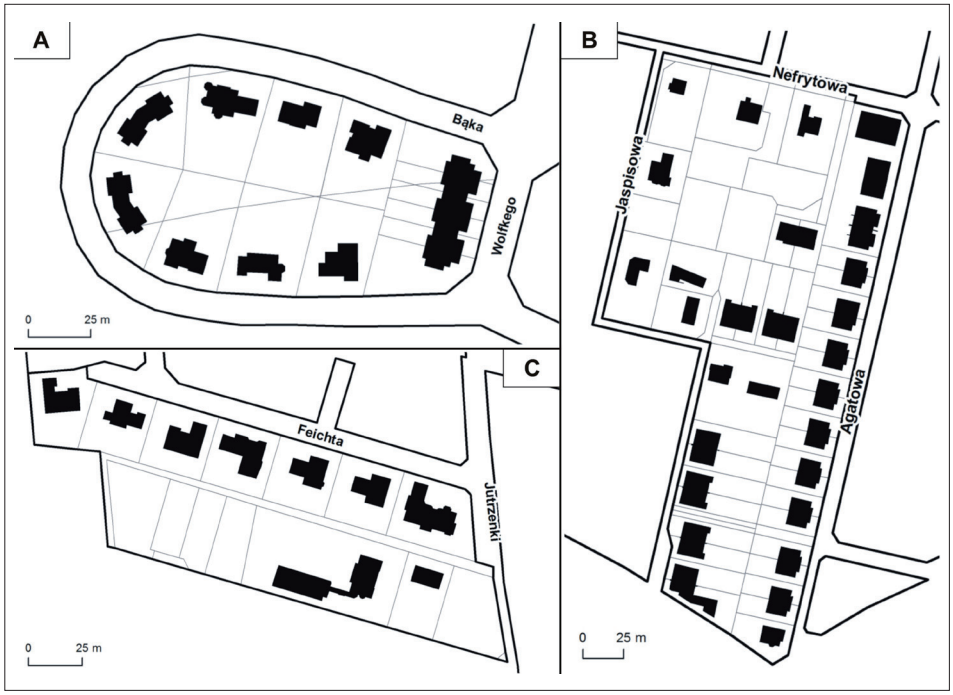

Fig. 11: Detached housing forming intra-urban suburbs in Wrocław: A – Marszowice, B – Ołtaszyn, C – Oporów
Source: author's elaboration

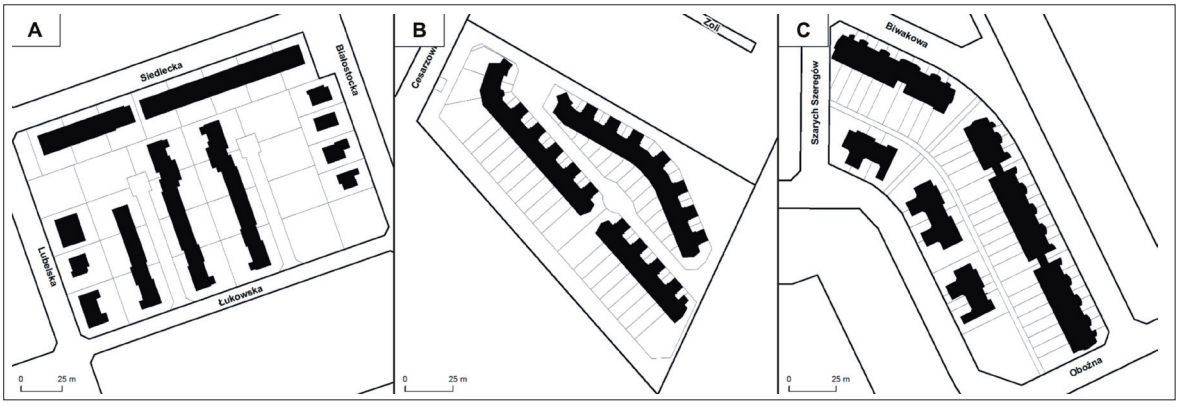

Fig. 12: Semi-detached housing forming intra-urban suburbs in Wrocław: A – Maślice, B – Oporów, C – Wojszyce
Source: author's elaboration

by families with small children. In all the investigated housing estates or residential districts, the mobile working age population (25–45 years) and children under 14 years dominate (Fig. 13).

The median population age in 2016 was 26.5 years in the case of the estate at Żernicka Street, 28.3 years for the estate at Lipa Piotrowska and 28.8 years for the Jagodno estate (compared to the average for Polish cities of 41 years). In all cases, the proportion of the population of pre-working age was over 30% (average for Polish cities: 15.7%), while the share of population of post-working age was around 5–6% (compared to the average for Polish cities of 22.3%). Furthermore, as shown by the survey, at the estate at Żernicka Street the real number of estate inhabitants was significantly different from the population recorded in the official statistics (the data for this estate from the PESEL database underestimated the real population by around 34%). A similar underestimation occurs in other housing estates analysed. This is evidenced by the number of "empty" apartments, for which there is no data on the population living there in the official PESEL database.

Meanwhile, a slightly different picture is offered by the population structure by sex and age in communal multi-family housing estates (the estate at Wojanowska Street), as well as the single-family housing estates built by development companies (the Malownicze estate). Here, the largest proportion is of the working age population (25–49 years) and children under 19 years (Fig. 14). There is also a far higher share of post-working age populations (in the case of the Malownicze estate it was 6.7%, and for the estate at Wojanowska Street, 11.4%).

The median age for the two estates was 29.5 (Malownicze estate) and 32.6 years (Wojanowska Street). On both estates, the population structure is similar to population structures of single-family residential districts in the first ring of suburban zone (Fig. 15).

This can be related to individual population groups having differing preferences with respect to place of residence within the agglomeration space. Single-family residential districts (located both within city borders and in the suburban zone) are settled mainly by 'well-off' residents with a stable situation (the so-called upper middle class, who can afford to buy their own house). New estates with multi-family housing, on the other hand, are settled by residents who are slightly less well-off, but who can still afford to buy their own flat (the so-called lower middle class). This may indicate the selective nature of suburbanisation. Multi-family housing estates are usually built in the peripheral

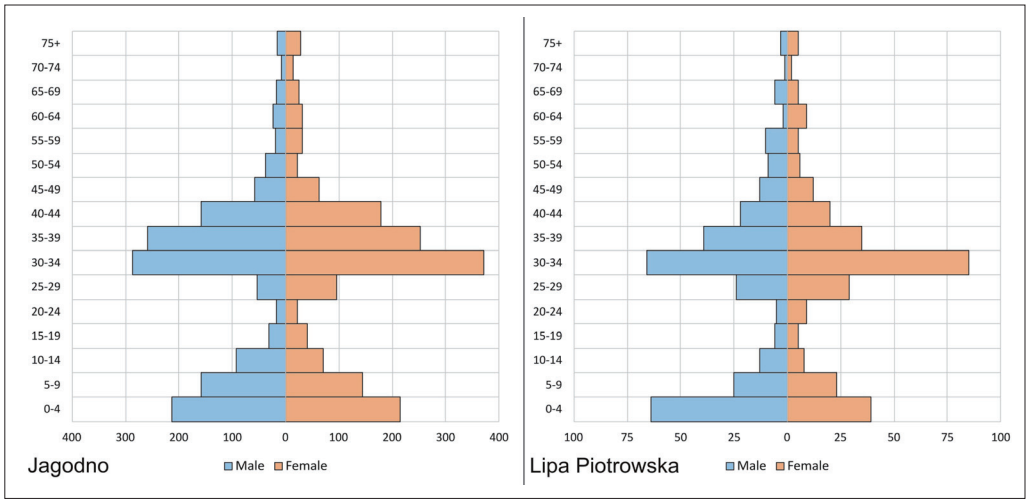

Fig. 13: Population by sex and age in multi-family housing estates built by development companies in Wrocław (2016)
Source: author's elaboration based on PESEL database

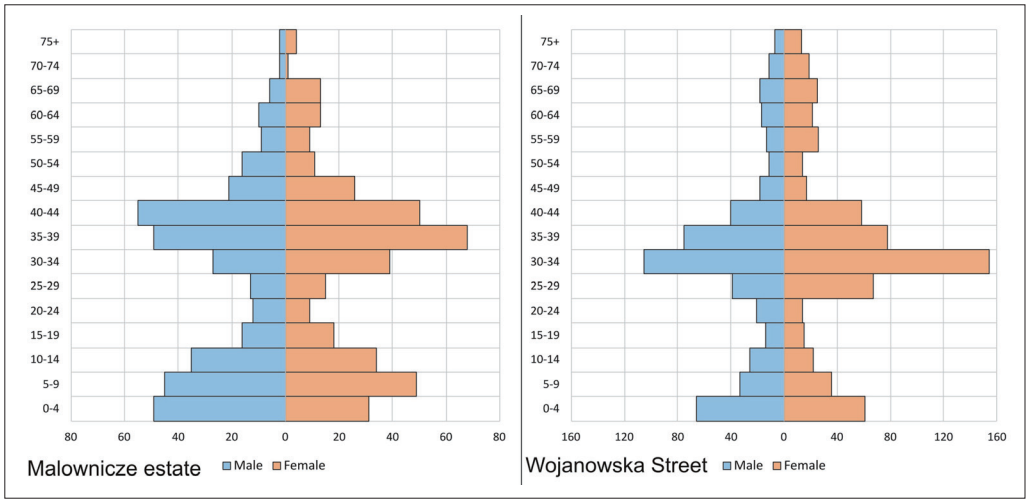

Fig. 14: Population by sex and age in single-family residential districts built by development companies and communal multi-family housing estates in Wrocław (2016)
Source: author's elaboration based on PESEL database

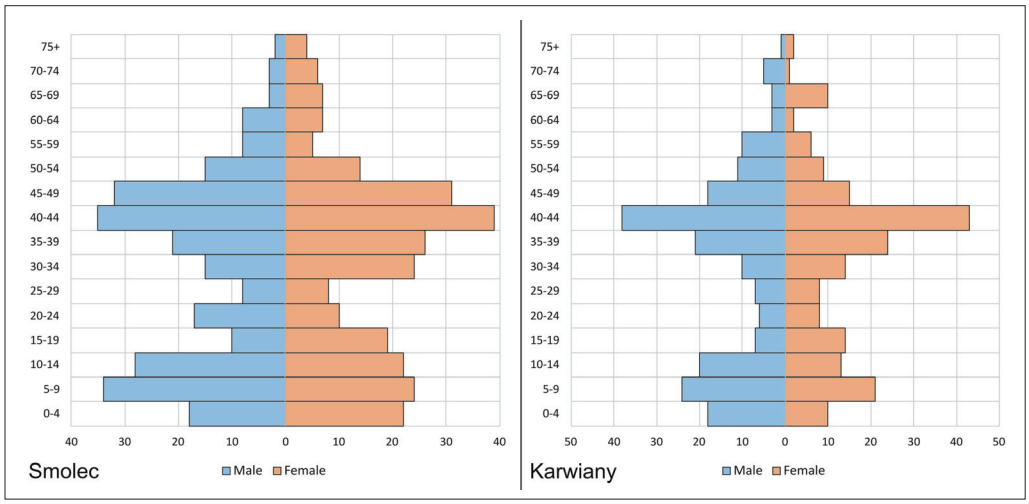

Fig. 15: Population by sex and age in single-family residential districts in the suburban zone of Wrocław (2016)
Source: author's elaboration based on PESEL database

zone of the city, but within the city borders (intra-urban suburbs), while villa estates are more often built in the proper (outer) suburban zone.

Despite the differences identified in various types of housing estates, the influx of people to the area of the intra-urban suburbs contributes to a significant rejuvenation of their population structures. It stands in contradiction to the problem of the ageing of cities located in Central and Eastern Europe, which is widely described in the literature (e.g. Hoff, 2011; Kurek, 2011; Kabisch and Grossmann, 2013). This process undoubtedly occurs, but it concerns the most central parts of post-socialist cities, while their peripheral zones are characterised by a different demographic specificity. The different population structures are also related to the different needs of the people living in the analysed parts of the city, which may have specific consequences for urban governance.

The results of the survey conducted in 2018 in the Żernicka Street estate demonstrate that 75% of the resident adult population has higher education (they are mainly specialists, office workers, teachers and engineers), and small business owners dominate among the rest (22%). Most persons on the estate (73%) previously lived in Wrocław, mainly in the central districts of the city (in the Stare Miasto or Śródmieście), which indicates the direction of population movements within the city (from the centre to the peripheral zones) consistent with the essence of suburbanisation. Interestingly, more than half of this group of residents (52%) indicated that they had not lived in Wrocław since birth, and their arrival in the city was associated with studies or taking up their first job. The remaining residents of the estate came to Wrocław mainly from medium-sized towns located up to 150 km away from the city. Among the residents of the housing estate, young married couples with children (51%) and couples without children (37%) predominate, and the average number of people per apartment is 2.57.

From this survey, the most important factors in choosing the current place of residence included: quiet, calm and attractive area (63%); good location of the estate, mainly near the workplace (60%); and attractive price – lower than in the city centre (54%). Other factors included the character of the estate – a small gated-estate (32%), and good accessibility in terms of transport – near the motorway ring road and close to the city centre (20%). The most frequently indicated disadvantages of the current place of residence included: the vicinity of railway tracks and a busy street (43%); the lack of services near the housing estate (34%); and the lack of parking spaces (27%). In the case of Katowice (see Twardzik and Halama, 2017), inhabitants of the southern districts (Podlesie, Kostuchna and Zarzecze) also indicated similar advantages of living on the peripheral districts of the city (quiet, calm, proximity of green areas, far from the centre, options for active leisure).

4.4 Determinants of intra-urban suburbanisation in CEE cities

Urban sprawl and chaotic development patterns are two of the main negative urban patterns of post-socialist urban transformations in Central and Eastern European cities. The costs of sprawl are also one of the main negative urban impacts on urban development (Hirt and Stanilov, 2009). This is because suburban sprawl is believed to have significantly contributed to increased vehicle use, land consumption and higher household energy consumption (Kahn, 2000). Increasing transportation between the hinterland and the core causes traffic jams on radial communications in the inner and outer city (Ouředníček, 2007; Sýkora and Ouředníček, 2007). In Poland, the losses that households are facing due to chaotic suburbanisation can be assessed as high. These losses concern all residents of suburbs because intensification of the process of chaotic suburbanisation has financial consequences not only for the migrants but also for native villagers (by extending the time of travel and related costs). In order to reduce the negative economic consequences, it is necessary to design and implement a coherent road infrastructure solution for the city and surrounding municipalities (Lityński and Hołuj, 2017).

Another way of minimising costs of living in new developments is looking for free space for investment within city limits. This is particularly important for urban authorities. Suburbanisation contributes not only to increasing road traffic or the necessity of serving populations de facto from outside the city: for the city and its budget, loss of population also means loss of tax revenue. Thus, urban authorities are themselves interested in keeping inhabitants within city borders. In the case of the larger cities of Central and Eastern Europe, the presence of large non-urbanised areas, particularly agricultural land, which can now serve as potential space for new construction investments, results from the features of territorial development of the cities

during the socialist period (Szmytkie and Krzysztofik, 2019). Such incorporation processes contributed to a significant expansion of city limits – for the largest cities in Poland (Szymańska et al., 2009; Szmytkie and Krzysztofik, 2019), for Prague (Sýkora, 1999; Sýkora and Ouředníček, 2007), for Bratislava (Feráková and Jarolímek, 2011), for Belgrade and Sofia (Slaev et al., 2018) or for Budapest (Soós and Ignits, 2003; Egedy et al., 2017). Further, Spórna and Krzysztofik (2020) have identified primary factors of 'inner' suburbanisation development in the Katowice conurbation, which are: (1) polycentrism of the settlement form imposed by the development of a group of mining and industrial cities and estates; (2) the existence of large agricultural areas between compact zones of residential, industrial and service developments; (3) a mosaic pattern of spatial and functional structures in the Katowice conurbation core; (4) changes in the family model, social changes; (5) changes in the macroeconomic dimension, growing prosperity of the population; (6) the development of the speculative real estate market; (7) EU entry; (8) 'Flexibly applicable' of the Planning and Spatial Development Act and the Building Law Act; (9) the mosaic of forest areas, cultivated green areas and reservoirs; (10) a dense road network, including national roads and motorways; and (11) an insufficient number and area of flats, despite strong socialist urbanisation. These factors seem to be considered as generally applicable in the development of intra-urban suburbanisation in Central and Eastern European cities.

Studies carried out in recent years have shown that areas of new residential developments within the boundaries of large cities in Central and Eastern Europe are characterised by good transport accessibility, competitive prices of land compared to rural areas, and access to green areas. As such, they constitute convenient migration destinations for urban populations (Katowice conurbation – Spórna, 2018); they emerge in areas with good environmental conditions (Bratislava – Ira, 2003); they have been the exclusive targets of dominant migration flows where housing supply has had considerable time-space consequences for the spatial pattern of population growth through migration (Prague – Sýkora and Čermák, 1998); and they are populated by affluent individuals as reflected by the spatial distribution of mansions (Łódź – Szafrańska et al., 2019). In Warsaw, after 2000 the scale of housing supply built by developers began to increase dynamically. Centrally located projects were typically infill developments in the existing urban fabric that are often, though to a varying extent, adjusted to the adjacent urban fabric. In contrast, sub-central and peripheral investments were often large-scale housing estates that consume a greater amount of land, often including an internal road infrastructure on a private estate that locks out outsiders and has no connection to its immediate surroundings (Stępniak and Mendel, 2013). In the Katowice conurbation, intra-urban suburbanisation occurs primarily on post-agricultural land, and to a lesser extent on brownfield sites. In the conurbation as a whole, the development of mid-sized and small clusters is predominant. The largest clusters of new residential developments include areas located in the built-up area and its immediate surroundings (up to 1 km away) (Spórna and Krzysztofik, 2020).

5. Discussion

Wrocław is an example of a city that is undergoing intensive suburbanisation processes. These processes started in the 1990s along with the socio-economic transformation and intensified in the 2000s. Moreover, in this case suburbanisation is manifested not only in the development of individual residential construction in the suburban zone (so-called residential suburbanisation), but also has the nature of commercial suburbanisation, with the effect of business activity development in the near suburban zone (Brezdeń and Szmytkie, 2019). Processes occurring in the surroundings of Wrocław are thus like those observed in the surroundings of other large cities in Central and Eastern Europe (compare: Sýkora, 1999; Lowe and Tsenkova, 2003; Soós and Ignits, 2003; Hamilton et al., 2005; Nuissl and Rink, 2005; Hirt and Stanilov, 2007; Sýkora and Ouředníček, 2007; Brade et al., 2009; Kubeš, 2013; Martyniuk et al., 2016). Intensive suburbanisation, which is characteristic for post-socialist countries, supported in Poland by the liberal planning law and a still strong societal desire to live outside the city, have led to the development of new settlement units and separated clusters of buildings (Mantey and Sudra, 2018).

In contrast, the development of peripheral districts located within city limits has a similarly intensive character. Suburbanisation in the classical sense (Berg et al., 1982) involves demographic development of the suburban zone with a simultaneous decline of population (depopulation) in the agglomeration core (central city). In the case of Wrocław the situation is slightly more complex. The central part of the city (Stare Miasto, Śródmieście) is indeed undergoing depopulation. The decline in population is also ongoing in large panel block estates from the socialist period, which is typical for post-socialist cities (e.g. Soós and Ignits, 2003; Banzhaf et al., 2007; Steinführer and Haase, 2007; Sýkora and Ouředníček, 2007; Brade et al., 2009; Marcińczak, 2012; Stępniak and Mendel, 2013; Haase and Rink, 2015; Spórna, 2018; Szafrańska et al., 2019). In former villages incorporated into city boundaries in the 20th century, however, the population situation is different. Due to a large surface of agricultural land within their areas, researchers note the high construction activity which contributes to a growth in number of inhabitants. The character and intensity of these processes is reminiscent of suburbanisation processes occurring in the first ring of the suburban zone. Due to their location with respect to the agglomeration core, they can be called intra-urban suburbanisation (see Koman, 2017; Spórna, 2018; Szafrańska et al., 2019, Spórna and Krzysztofik, 2020). Importantly, the scale and dynamics of this process are comparable to those observed in the surroundings of the city, and the intensity of construction traffic inside the city may be even greater than in the suburban area. The importance of intra-urban suburbanisation is also manifested in the increase in population and the rejuvenation of the population structures of the peripheral parts of the city (in opposition to depopulating and ageing central areas), which shapes the duality of the demographic situation within the city. Broadly speaking, this process can be interpreted as the reaction of the city to the suburbanisation processes, which are unfavourable to the city (Kahn, 2000; Hirt and Stanilov, 2009; Lityński and Hołuj, 2017).

Due to the administrative distinctiveness of the suburban communes, the city cannot directly influence the activities undertaken in its vicinity. With free land for development, however, it can create opportunities for construction within the city. One factor that made the start of intra-urban suburbanisation processes possible in Wrocław was the significant expansion of city borders in the 20th century. Incorporation processes were one of the most important

factors of development of large cities in Poland (Szymańska et al., 2009; Szmytkie and Krzysztofik, 2019) and in other Central and Eastern European countries (Sýkora, 1999; Soós and Ignits, 2003; Sýkora and Ouředníček, 2007; Swianiewicz, 2010), while they are rarely found in Western European countries. The territorial expansion of cities often exceeded the capabilities of their real (rural) spatial development, and thus weakly urbanised peripheral city districts preserved their original character, simultaneously keeping a significant area of undeveloped and non-urbanised land (today potentially investment land). The problem with non-urbanised spaces within the city borders also concerned cities that developed polycentrically, e.g. cities of the Katowice conurbation (Spórna, 2018) or so-called city conglomerates (Szmytkie and Krzysztofik, 2019). This may explain the formation of intra-urban suburbs in central (in the geometrical sense) parts of cities in the Katowice conurbation (see Koman, 2017; Spórna, 2018, Spórna and Krzysztofik, 2020).

New construction projects in Poland are also often located in the area of urban gardens, which play a significant role in urban space as green environments, as new sociations, and even locations of food production. The character of the territorial development of large post-socialist cities in CEE and the specific nature of modern intra-urban population changes prompt a further investigation into the spatial structure of urban agglomerations in the region. In the case of Wrocław, the core of the urban agglomeration actually covers a densely built-up area whose boundaries approximately cover the territory of the city from the start of the 20th century and an area of high-rise blocks from the socialist period. Around the agglomeration core, there is a ring of intra-urban suburbs which cover the area of former villages incorporated into the city in the 20th century. This ring turns into the first ring of the real suburban zone, as in their area residential suburbanisation sometimes occurs even independently of administrative borders. A good example of this is the spatial development of the districts of Ołtaszyn and Partynice in Wrocław on the territory of Wysoka village (Kobierzyce commune). The outer zone of the agglomeration is formed by the second ring of communes surrounding the city (see Brezdeń and Szmytkie, 2019). According to Spórna and Krzysztofik (2020), intra-urban suburbanisation may also be an interesting tool for channelling spatial development towards the centre of a settlement system. This phenomenon may counteract the processes of urban decentralisation, although maintaining urban sustainability during this process is important (Jabareen, 2006; Talen, 2014). This interpretation of the process is a reference to the 'compact cities' concept (Dieleman and Wegener, 2004), and may be of especial interest for cities and urban agglomerations with a distributed or chaotic layout.

6. Conclusion

The intra-urban suburbanisation phenomenon is characterised by intensive construction activity and population growth in peripheral districts of the city. Such processes are counter to depopulation processes observed in central parts of the city and in the large panel block estates (i.e. in the agglomeration core). This duality of demographic changes within city borders contributes to significant changes in the distribution and structure of the population in the relationship between the centre and peripheral districts of the city, and also to the significant changes within city space, particularly in morphology. As regards changes in population structures, the population structure by age is rejuvenated in peripheral districts, while demographic ageing is noted in central parts of the city. Construction activity in central districts leads to infill developments in the existing urban fabric. In contrast, sub-central and peripheral investments are often large-scale residential districts that consume a greater amount of land, lock out outsiders and have no connection to their immediate surroundings. The size of construction activity in Wrocław suggests that the population of the city is growing (the increase may be estimated at even 200 to 220 thousand persons since 2000), while according to official statistical data in this period the number of inhabitants of the city decreased by approximately 2.9 thousand persons.

The population in the suburban zones of large cities is similarly underestimated. This difference suggests that official statistical data require verification with respect to changes in population numbers in large cities of Poland and their surroundings. Intra-urban suburbanisation, in terms of scale, dynamics and character, is like classic suburbanisation, understood as the development of suburbs, but occurs within the administrative boundaries of the city. Hence, it is omitted from official statistics that are averaged for the city as a whole, helping to mitigate depopulation and other negative processes occurring in the central parts of cities. At the same time, the dualism of socio-economic processes (and the resulting needs of residents) within the city is a challenge for planning and urban governance (see Spórna and Krzysztofik, 2020). In this context, research aimed at identifying internal suburbanisation and the characteristics of the process appear to be important. It is also worth considering the issue what kind of suburban development is more sustainable and useful for the city, and how can the city use planning and policy for management of such developments. This question implies the need for further research on the problem of intra-urban suburbanisation.

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Fig. 6: Fumaroles and geothermal boreholes at Þeistareykir, NE-Iceland (Photo: K. Benediktsson)

Fig. 7: Energy landscape at Hellisheiði, SW-Iceland (Photo: K. Benediktsson)

Illustrations related to the paper by K. Benediktsson