GEOGRAPHICAL MOBILITY BARRIERS IDENTIFICATION FOR PERSONS TO BECOME ACTIVE

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Abstract
*The purpose of this paper is to provide solutions to accelerate sustainable development in a balanced manner across the territory and to reduce poverty. Periphery Locations far from the Centre and their people could be integrated through labor market place-based policies focused to increase geographical access to jobs. During 2016-2019 the number of employees that beneficiated from geographical mobility activation measures increased almost 2.5 times. Even if there is progress, there is still enough to do to fully exploit the geographical mobility advantages, due to the most vulnerable categories as Guaranteed Minimum Income (GMI) beneficiaries from rural marginalized communities, clusters with the highest density, etc. The research question is "What are the geographical mobility barriers for persons to become active", using dynamic traffic maps and the big data facilities provided by ESRI- GIS Exploratory Spatial Data Analysis (ESDA) instruments. **We visually identify the geographical mobility barriers for persons to be activated using the Map overlay technique for normal layers and big data layers. The normal layers cover the target group area and road transport infrastructure development**. The big data layer provided by the World Traffic Service presents the traffic monitoring history from the last 3 years at Romania's European network roads level. The main results indicate that the marginalized communities structured as clusters could be comparable by vulnerability but differentiated by geographical mobility factors. It is the moment to fully exploit the advantages of GIS and Big data instruments and develop also network smart solutions. The labor market policy-based interventions, harmonized with network smart solutions could reduce inequalities and the proportion of disadvantaged both inside Romania and among the countries.*

Keywords
Vulnerable persons; vulnerable communities; activation measures; spatial mobility; GIS; Big data.

Introduction

Geographical mobility barriers identification for persons to be activated has practical relevance for public policies focused on ending poverty and deprivation. Any person of working age, with work capacity and willingness to work when gain a decent income from work is integrated into the labor market. If the income is decent, in the sense that it is enough to support a decent life for the adult and its dependents, then the family gets out of the social assistance benefits support. To get and preserve a job, the person searches, finds and accesses a job, actively.

The topic of ending poverty and deprivation is assumed by the 2030 Agenda for Sustainable Development, adopted by all United Nations Member States in 2015 (SDKP, 2015). The 10th SDG focuses to reduce inequalities, one of the 17 Sustainable Development Goals (SDG). It targets to progressively reduce inequalities and the proportion of disadvantaged groups both inside the countries and among the countries. Romania, as a UNO and EU State Member, assumes the National Sustainable Development Strategy 2030 (SNDDR 2030, 2018),

Our target groups of interest are the most vulnerable persons in rural areas, Minimum Guarantee Revenue (GMI) beneficiaries. These persons need support to transit into employment through labor market policies. Rural areas offer jobs in agriculture, forestry, fishery, etc. that demand geographical mobility. The labor allocation in rural areas for activate persons (searching for a job) is non-functional. Romania's rural tend to accumulate unemployed and long-term unemployed. The rural share of unemployed of 52% in 2019, increasing by 5 pp since 2016 and a share of 55.3% of long-term unemployment in 2019 compared to 2016. *(TEMP INS: AMG130L - AMIGO)*

Recent literature (Duranton & Venables, 2018) points out that place-based policies deliver more diverse benefits than direct and indirect effects. One important benefit is the proximity, which decreases the transport costs, increasing returns to scale (agglomeration economies). Transport improvement direct effect saves time and operating costs. Its indirect effect increases private investment, job creation, and productivity.

The research of urban and rural gap is signaled under the 10th SDG. People at risk of poverty or social exclusion (sdg_01_10a, Eurostat) are mostly concentrated in rural areas. In 2019 their share is for Romania 44.3% and 23.5% in the EU. This gap is still huge, even the trend is to decrease with 7.4pp since 2016 for Romania and with 2 pp for EU. Signs of progress in rural are very slow, compared to urban and even towns and suburbs. The presence of very high gap urban-rural levels indicates the presence of inequalities due to income, sex, age, disability, race, class, ethnicity, religion, and opportunity. These urban-rural inequalities demand public policy solutions differentiated by place.

The purpose of this paper is to end poverty and other deprivation across the territory through the increasing spatial allocation of the vulnerable labor, Space mobility improve the labor allocation in Centre Periphery spatial economic structures, on the trends of the labor deficit and aging population. Our research question is "What are the geographical mobility barriers for persons to become active", especially for the very most vulnerable,

The originality and the scientific contribution of the paper are the GIS big data instruments using in the poverty alleviation topic. ESRI- GIS Exploratory Spatial Data Analysis (ESDA) of the dynamic traffic maps provide new useful insight for mobility measures update.

The structure of the paper comprises an introduction, theory and public policy aspects regarding the geographical mobility of vulnerable labor force, the research design and methodology, followed by results and discussions, and finalized with conclusions regarding barriers and solutions in increased access to the labor market.

Space mobility in the theory of Agglomeration Economy and New Economic Geography literature

Marshall, (1920 p. 268) explained the economic principles of agglomerations, and since 1890 launches the concept of positive externalities. Fischer and Nijkamp (1987) note that "labor markets are segmented by firm, industry, job type, worker type, occupation, and spatial location. In other words, the macro process of labor market segmentation is associated with a spatial segmentation process."

The Dixit-Stiglitz (1977) model, based on the principle that "a commodity should be produced if the costs can be covered by the sum of revenues and a properly defined measure of consumer's surplus". Starting in 1985 the NEG theory emerges, which integrates geography with new trade and new growth. Fujita, Krugman, and Venables (1999) present a spatial version of the Dixit Stiglitz Model (FKVM). The spatial heterogeneity of resources induces inherent differences among locations, as a result of cumulative processes: urban and rural, industrial belts, etc. In FKVM model acts three localization forces: two of agglomeration forces and one of dispersion. Costs and demand act as agglomeration forces and local competition acts as dispersion forces.

Kancs (2014) synthesize *the increasing returns to scale and localized externalities* as Agglomeration Forces with the *market access* and *the price index effect*. On the other side, the trade costs and imperfect competition (monopolistic or oligopolistic competition) are the main Dispersion Forces with *market crowding effects*.

Core-periphery is a tool to model labor mobility and migration. The dynamics of agglomerations are developed by Perroux (1955) which presents the case of growth poles, Myrdal launch in 1957 the cumulative causation through the dispersion or concentration-effect (Myrdal, 1957). The Core locates abundant capital while the periphery locates abundant labor in a static image. The difference across space in both dimensions generates labor flows and capital flows in contrary directions. Abundant labor or capital demand for adequate capital-labor. This new equilibrium is created through migration/mobility/brain drain of labor towards the core, for higher wages and incomes.

Virtuous or vicious cycles of development, are present at the same time, but in different locations. Success locations (OECD, 2006) attract labor, resources, and capital while

donor locations lose their labor, resources and do not attract capital, lose their population, and remains only the aged and children.

Space mobility in public policies and place-based labor market interventions

The labor market policies develop a specific intervention, place-based approaches, in view to support the employment transitions for the most vulnerable persons, i.e. long-term unemployed and inactive persons. The target group is eligible for geographical mobility measures if its location or the employer location is a location affected by vicious development cycles.

The most vulnerable persons' short profile

The European Union (2018), when delineates the intervention for activation, defines the most vulnerable. The most vulnerable are: the prime-aged women with low education, Roma, and young people, mainly from rural areas. Conventionally each of these groups is classified as target groups and beneficiate by adequate activation policy design.

The spectrum of the most vulnerable is large and each demands a specialized approach. One particular case is the social aid beneficiaries, a means-tested benefit applied by the Law 416/2001 for a person or a family called Minimum Guarantee Revenue (GMI). The activation reform is visible. The GMI beneficiaries decreased by one third from 247 thousand in June 2016 at 169 thousand in June 2019 (MMPS, 2019)

The standard activation measures are not enough, especially when these populations are agglomerated in marginalized locations with no or less economic opportunities. Therefore, the minimum income beneficiaries from marginalized locations, rural ones, are the very most vulnerable ones!

Locations with vicious development cycles

The National Mobility Plan (NMP) is active since 19 December 2016 and amended by GD 903/2016 [HG nr. 903/2016 pentru aprobarea Planului naţional de mobilitate] on 19th September 2017 till present (HG 903, 2016). The NMP, based on a World Bank Project, contains two lists, result of multi-criteria spatial analysis:

The LIST of (798 localities) rural-administrative territorial-administrative units with a degree of marginalization above average and degree of severe marginalization, of "low" administrative-territorial units according to the values of the local human development index and of the administrative-territorial units in which the share of registered unemployed or beneficiaries of minimum guaranteed income and family support allowance in the population by residence, aged 18-62, is over 10%, except for the administrative-territorial units in the counties of Iasi and Vaslui (HG 903, 2016).

The LIST of the administrative-territorial units in the Jiu and Roşia Montană Valley Pilot Areas, as well as the administrative-territorial units from Iaşi and Vaslui counties with a degree of marginalization above average and a degree of severe marginalization with a low degree of development according to the values of the local human development index and those in which the share of registered unemployed persons or beneficiaries of minimum guaranteed income and household support allowance in the 18-62-year-old population is over 10% provided in the Memorandum approved by the Romanian

Government, with the theme: Development of Integrated Programs from European Funds and the National Budget for Improving the Social and Economic Situation of the Residents in the Jiu Valley Intervention Pilot Areas, the Roşia Montană - Apuseni Mountains and Marginalized Communities in Moldova. (HG 903, 2016)

Lincaru et al. (2020) concluded that in Romania, the minimum income beneficiaries from rural areas are agglomerated in locations with vicious development cycles. Authors use the Exploratory Spatial Data Analysis (ESDA) (Anselin, 2005) and map of the minimum income benefit beneficiary's spatial density distribution at the locality level (LAU former NUTS 5). These areas are called in this paper in view to identify barriers for the most vulnerable from the marginalized locations in supporting the geographical mobility access to a job.

Space mobility place-based labor market specific measures for most vulnerable persons from rural areas interventions in Romania

Active labor market policies (ALMPs) following 2015 improved significantly in scope and design "an appropriate mix". Since 2019 the legislative framework reform towards accessing EU-financed ALMPs has become functional. LTUs and inactive that could become active, are beneficiaries of active measures that encourage job search. These geographical measures are provided as allowances for jobseekers (activation as a new measure, reallocation), the mobility schemes (installation and integration). A specific mobility allowance is an activation allowance for the LTUs and inactive.

The mobility allowances (Hiring or Installation) suffer legislative improvement in the L76/2002, fact that mark the Reform of Place-Based Policy applying including digital solutions adopting. Linking the people with space and increasing significantly the mobility allowance through OUG 60/2015 is made also in the employment policy the Reform of spatially integrating administrative, social and economic dimensions, setting the sound foundations for future holistic approaches. *National Mobility Plan (NMP) links the people and their present and future locations by common characteristics in spatial patterns distributions.* On this background, these active measures present the objective to increase the geographical mobility, to improve the spatial allocation of the labor force across areas with problems in a smart manner. This Plan is approved and updated by Government Decision, at the proposal of the MMJS regularly. Both Mobility allowances, the Hiring and Installation allowance quantum was raised by OUG 60/2016 by 2.5 times and were applied Starting 3 December 2016.

a) Hiring Allowance ([prima de incadrare) Art.74. (1) L76/2002 modified by OUG 60/2016, let the unemployed taking up employment at more than 15 km away from the locality of residence to beneficiate of a Hiring allowance, untaxable. The quantum of allowance is calculated 0.5lei/day but not higher than 55lei/day for transport expenses, relative to the working days of commuting, for a maximum of 12 months' duration. The employing unit or the applicant must be domiciled in a locality according to the national mobility plan;

b) Installation Allowance (prima de instalare) Art.75. (1)/L76/2002 modified by OUG 60/2017, let the unemployed taking up employment in other location, by changing their residence > 50km to beneficiate of an Installation allowance, untaxable. The quantum of

Installation allowance is differentiating by the appurtenance of the person to a specific target group. This quantum is, 12500 lei if a person is registered unemployed; 15500 lei if the registered unemployed is accompanied by family members according to the law, including the case of monoparental families, their children in this case; 3500 for the second registered member of the couple in the case when both husbands meet the condition for granting this allowance. If the employer assures housing service or refunds housing expenses, then the allowance decreases by 9000 lei for each of the first two cases. The Installation allowance is granted in two tranches. One trance equal to 50% at the installation date and a tranche equal to 50% of the amount set after the expiry of the 12 months after employment, in the case of a primary registered unemployed family member. The employing unit or the applicant must be domiciled in a locality according to the national mobility plan

c) Relocation allowance (Prima de Relocare - Prima chirie) since 25 January 2017, as a consequence of OUG 6/2017. Covers 75% from the housing expenses in the new domicile or new residence, but under the 900 lei floor, for persons with net monthly incomes below 5000lei/month, for a maximum 36 months' duration. The Relocation allowance is granted at the request and it is not additive with Activation, Hiring, or Installation Allowance.

During 2016-2019 the increased almost 2.5 times the number of employed that beneficiated of geographical mobility activation measures, from 1 .1 thousand employed persons to 2.5 thousand employed persons, while the total number of employed persons through the Employment Program decreased from 288.6 thousand to 275.8 thousand. (See Table 1) Also, the rural persons, employed in a higher share. In 2109 were 46.9%, higher than in 2016 with 3.7pp. In short, even there is progresses, there is enough potential to fully exploit the geographical mobility advantages.

Table 1. Number of persons employed as a result of the implementation of the Program for Employment through the stimulation of the labor force mobility on December 31, in 2016 and 2019 (MMPS, 2017, 2018, 2020)

PNAO Active measure type, executed	2016	2017	2019
TOTAL employed persons, out of which:	**288589**	**300474**	**275830**
The share of employed persons from rural areas	**43.2%**	**45.2%**	**46.9%**
Through the stimulation of the labor force mobility	**1106**	**1879**	**2528**
Unemployed taking up employment at more than 15 km away from the locality of residence (prima de încadrare)	411	1200	1418
Unemployed taking up employment in other location by changing their residence > 50km (prima de instalare)	695	258	251
Relocation allowance / prima de relocare		421	859
From which: Persons employed from rural areas through the Program 155 (153 in 2017) special for rural localities	*5788*	*6683*	*7410*
Persons employed from rural localities through geographical mobility of the labor force	*8*	*41*	*38*

Note: Administrative data. The reference year is 2016 because it is the year of the activation reform with implementation of the space mobility place-based labor market interventions

The research design and methodology

Exploratory Spatial Data Analysis

Exploratory Spatial Data Analysis (Anselin, 1995, 2002, 2005) is a family of new visualization techniques that exploit the "spatial" aspects of data. The geographic information systems (GIS) increased the capabilities for visualization, rapid data retrieval, and manipulation of social data in spatial distribution, showing and finding interesting patterns. GIS power of visualization empowered with Big Data since 2011. Deogawanka (2014) points that "Big Data analysis pulled disparate Spatio-temporal data in real-time, aggregate terabytes and more of spatial information, run analysis, and visualize results as maps to a better understanding of spatial trends and relationships". Big data provide dataset volume, variety, variability, velocity, and veracity that are summarized, more than interpret in maps (Kraak, 2017).

On this background, we visually identify the geographical mobility barriers for persons to become active using the Map overlay technique for normal layers and big data layers.

Map overlay initiated by (McHarg, 1971) McHarg (1971) "is a procedure for combining the attributes of intersecting features that are represented in two or more geo-registered data layers"(DiBiase & Dutton, 2009).

The normal layers of the target group area and road transport infrastructure development:
    a) the layer of the very most vulnerable from rural GMI Marginalized Communities. Lincaru et al. (2020) mapped the clustered patterns of the rural density of GMI beneficiaries at the locality level (LAU2 level, former NUTS 5) in June 2018. In our paper, the target group of interest is reduced to the social aid beneficiaries from rural GMI Marginalized Communities. The rural GMI Marginalized Communities are identified by (Lincaru et al., 2020) with ANPIS data for June 2018, and presented as layers in Figure 1(blue shapes) and Figure 2(an and b), as dark blue areas. Social aid (for ensuring the minimum guaranteed income) was received by 199.2 thousand GMI beneficiaries in June 2018 (3196 locations), 84% of which in a rural area (2874 rural locations), and 7% (from total) are in rural GMI Marginalized Communities (76 rural marginalized locations LAU2). We focus our spatial analysis on clusters [Iaşi-Vaslui-Bacău and Galaţi- Vrancea] (called in short Vaslui cluster) and [Mehedinţi-Dolj] (called in short Dolj cluster), clusters with the highest density, covering large areas, with persistent presence. On average, the number GMI beneficiaries is 438/LAU2, higher by 3 times than the average national rural mean of the GMI of a LAU2, and higher by 14 times than the average of the Low-Low national rural mean of the GMI beneficiary at LAU2.
    b) the layer of the density of the public road length (code Territorial Observatory – Development Ministry od: 4.4.1.1, provided by INS). In the public roads, the indicator includes "represents all roads open to public traffic throughout the country, grouped administratively, respectively the national, county and commune level roads network.

The big data layer provided by the World Traffic Service

World Traffic Service, (Esri, 2019) is a dynamic data traffic service that presents the average of observed speeds over the past three years, with an option to map the updated data every 5 minutes. The traffic monitoring is at Romania's European network roads

level (Annex - Figure 3). On these roads is visualized the "traffic speeds relative to free-flow speeds as well as traffic incidents". (Annex - Figure 4) In the map of Romania's traffic incidents snapshot on 11th June 2020, the "traffic speeds are displayed as a percentage of free-flow speeds, which is frequently the speed limit or how fast cars tend to travel when unencumbered by other vehicles. The streets are color-coded as follows: Green (fast): 85 - 100% of free-flow speeds; Yellow (moderate): 65 - 85%; Orange (slow); 45 - 65% and Red (stop and go): 0 - 45%". (Esri, 2019)

Results and discussions

The main results are presented in Figure 1. Vaslui cluster and Dolj cluster are comparable by structure, both have a high density of GMI beneficiary. Looking at the road access as a factor of geographical mobility, is visible a huge difference, important when design active measure for mobility support. Vaslui cluster presents a high-density road network infrastructure while the Dolj cluster is located in poor road infrastructure. The World Traffic Service indicates a barrier by traffic intensity and high risks of incidents on E574 around Târgu Secuiesc, with the second blockage at the Bacau city. These two nodal points are factors to decrease the geographical mobility, on the internal artery E574 and B class road that link: Bacău – Oneşti – Târgu Secuiesc – Braşov – Piteşti – Craiova.

Another barrier is, even it is indirect, but important, is visible in Figure 2(c), represented by the Bucharest ring road. Under the Centre periphery approach, Bucharest is the economic pumping hearth of Romania. The high intensity of traffic incidents projects high negative externalities across the entire economy, in terms of connectivity and transport efficiency.

More to emphasize that mobility is cross border. Dolj cluster, as a peripheral region, far from the Center – Bucharest is market by another barrier, pointed by the traffic regime. Calafat is opposite the Bulgarian city of Vidin, to which it is linked by the Calafat-Vidin Bridge, opened in 2013. As a frontier Municipium has a potential still underexploited. We mention that Calafat is a nodal point in the E79 A class road which link: (Hungary) – Borş – Oradea – Beiuş – Deva – Petroşani – Târgu Jiu – Filiaşi – Craiova – Calafat – (Bulgaria, Greece).
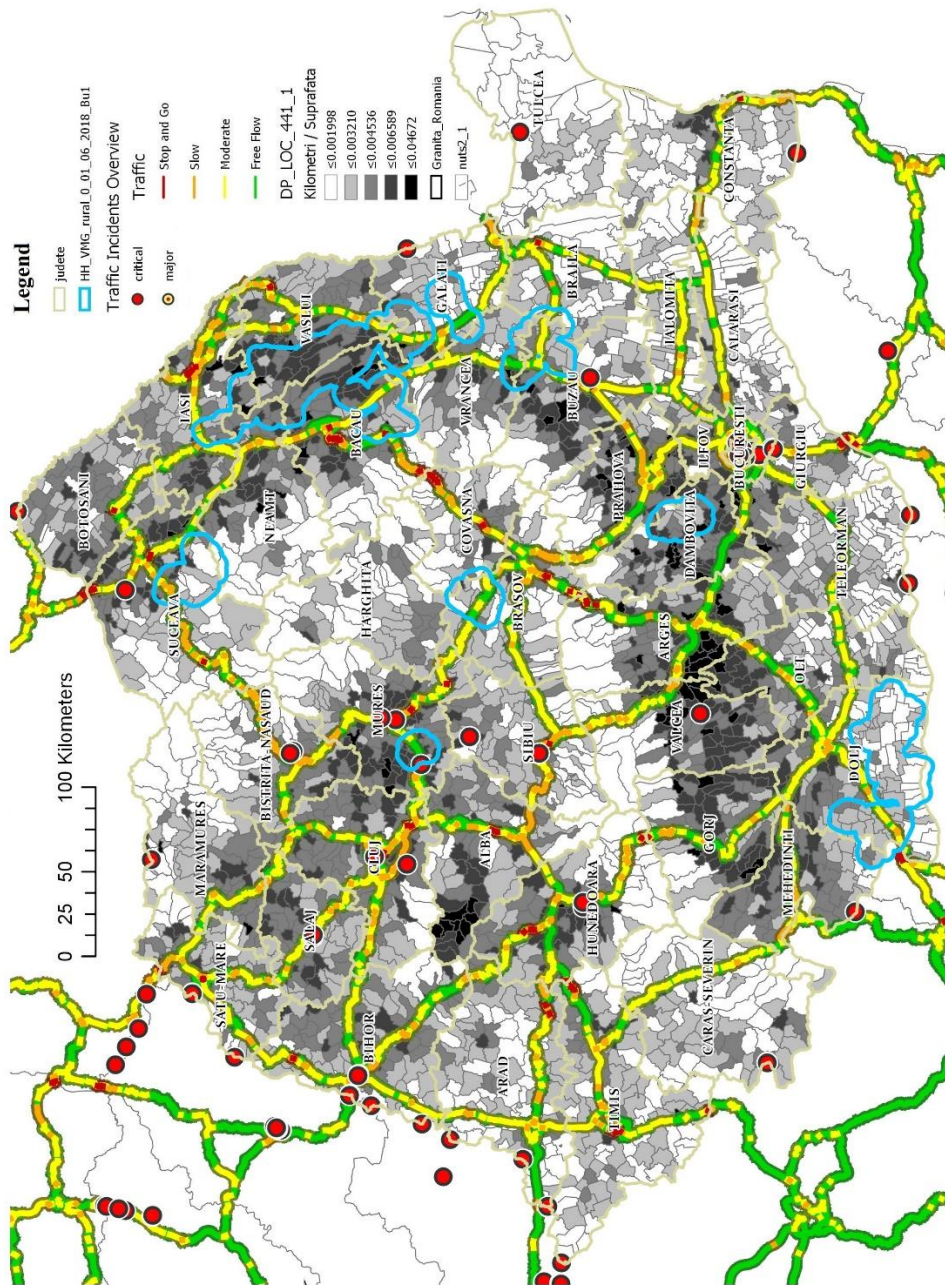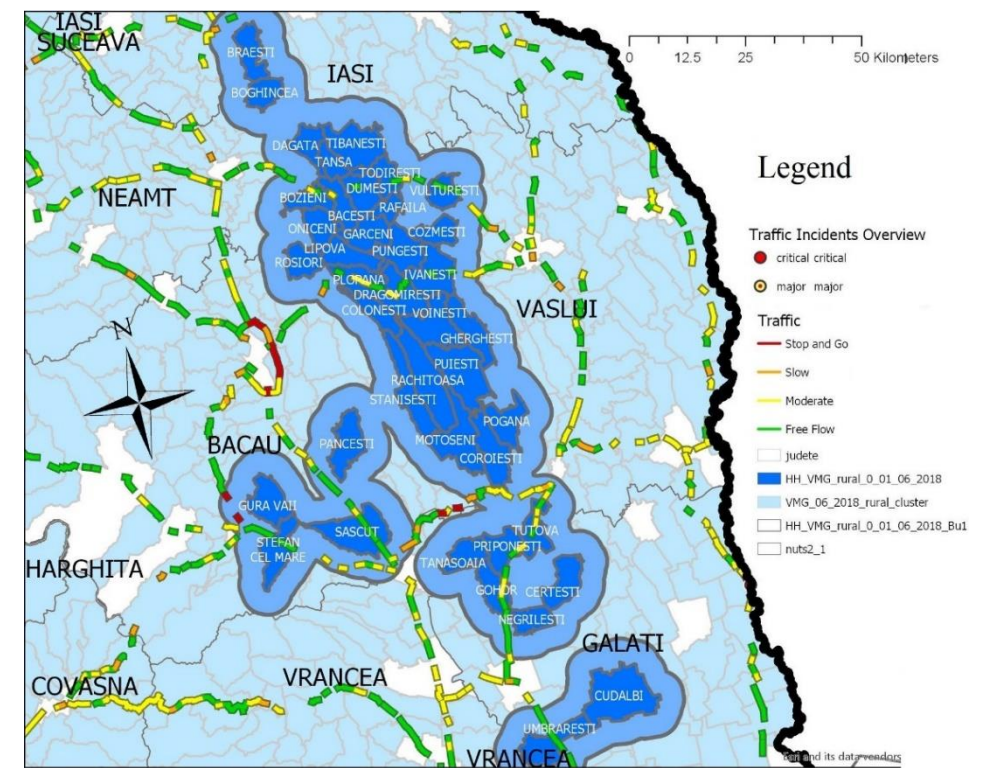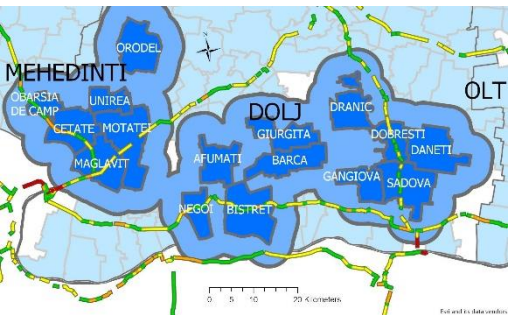
Figure 1. Geographical mobility barriers for persons to become active
(Made by authors in Arc GIS Pro 2.3.0 ESRI, using the instrument World Traffic Service, ESRI, downloaded on 11th June 2020, shapefile ESRI Ro, VMG data ANPIS Romania, OD 4.4.1 – The public road length Territorial Observatory of Environment Ministry, DP_Loc_441_1 the road length density calculated by authors)

a)   Iași-Vaslui-Bacău and Galați- Vrancea Clusters with high density of *GMI* beneficiaries'
       persons

*b) Mehedinți-Dolj Cluster with high density
of GMI beneficiaries' persons*

*c) Bucharest Cluster with the highest
density of traffic incidents overview*

***Figure 2. Detail for the main Clusters of persons to become active and
geographical main mobility barriers***
*(Made by authors in Arc GIS Pro 2.3.0 ESRI, using the instrument World Traffic Service, ESRI,
downloaded on 11th June 2020, shapefile ESRI Ro, VMG data ANPIS Romania)*

NMP is the base for location eligibility in vulnerable labor allocation across the territory.
The localities list is identified in a static manner using socio-economic characteristics.
Our results point out the importance of a dynamic regime of road infrastructure
exploitation.

The traffic bottlenecks are valuable diagnostic priorities for action that allow the cause treatment against the effect.

Conclusions

The 2020 Country Report mentions that "Regional disparities in Romania are amongst the highest in the EU. Significant gaps across regions persist in investment, productivity, competitiveness, and employment. Addressing them and prioritizing investment at a regional level would help increase the country's competitiveness and support long-term growth, development, and modernization." (European Commission, 2020).

In the 4th Country Recommendation, CSR 4, is recommended the "focus investment-related economic policy on transport, notably on its sustainability, low carbon energy, and energy efficiency, environmental infrastructure as well as innovation, taking into account regional disparities has made limited progress (European Commission, 2020). Geographical mobility barriers are not only physical but also given by the traffic regime. GIS and Big Data instruments offer new insights regarding the barriers and priorities to increase the effacing of labor market place-based measures. The inclusion of the very most vulnerable persons is not an intervention at the individual level, but at the community level.

The labor force mobility measures prove in recent times a positive impact in general, but not enough exploited. Spatial connectivity and labor force mobility are short-time solutions to increase sustainability for marginalized communities. A solution that emerged from spatial analysis with big data is personalized. Not only is the presence of physical road infrastructure important but also its functionality and regime of functioning. Solutions could be localized – improve the cross-border flow Bulgaria – Romania in Calafat, unblock the network points in Târgu Secuiesc, and Bacău as well as the Bucharest ring traffic flow improvement. Now it is the moment to fully exploit the advantages of GIS and Big data instruments and develop also network smart solutions.

The labor market policy-based interventions, harmonized with network smart solutions could reduce inequalities and the proportion of disadvantaged inside Romania. Some solution is at the border, and positive externalities should be shared with its neighborhoods (Bulgaria), and so, it contributes to reducing inequalities and the proportion of disadvantaged groups among the countries.

The main limitations of our research are the absence of the NMP map of localities and their updated version. The practical implication of our research is that, using BIG data we could update NMP dynamically for short and medium intervals of time. This representation offers information to employers about the potential mobility of active persons and geographical barriers. This could influence the recruitment policies and strategies of the companies but could be also supported for public policies to overcome the regional disparities stimulating the labor force mobility for the disadvantaged regions. The findings of our study could be used to develop alternative transport solutions, as well as stimulating companies to open small branches in isolated areas.

References

Anselin, L. (1995). Local Indicators of Spatial Association -LISA. *Geographical Analysis 27*(2). Retrieved from https://pdfs.semanticscholar.org/9875/60b6faaf0ced5e6eb97826dcf7f3ce367df2.pdf

Anselin, L. (2002). *Mapping and Analysis for Spatial Social Science*. Retrieved from http://www.csiss.org/events/conferences/2002/anselin_aaa.pdf

Anselin, L. (2005). *Exploring Spatial Data with GeoDaTM : A Workbook*. Retrieved from http://www.csiss.org/clearinghouse/GeoDa/geodaworkbook.pdf

Deogawanka, S. (2014). *Empowering GIS with Big Data ~ GIS Lounge*. Retrieved from https://www.gislounge.com/empowering-gis-big-data/

DiBiase, D., & Dutton, J. A. (2009). *5. Map Overlay Concept | The Nature of Geographic Information*. PennState College of Earth and Mineral Sciences, Department of Geography. Retrieved from https://www.e-education.psu.edu/natureofgeoinfo/c9_p6.html

Dixit, A.K., & Stiglitz, J.E. (1977). Monopolistic Competition and Optimum Product Diversity. *The American Economic Review 67*(3), 297–308.

Duranton, G., & Venables, A. J. (2018). *Place-based policies for development* (No. WPS8410; pp. 1–75). The World Bank. Retrieved from http://documents.worldbank.org/curated/en/547051523985957209/Place-based-policies-for-development

ESRI (2019). *World Traffic Service*. Retrieved from https://www.arcgis.com/home/item.html?id=ff11eb5b930b4fabba15c47feb130de4

European Commission (2018). *Country Report Romania 2018*. Retrieved from https://ec.europa.eu/info/sites/info/files/2018-european-semester-country-report-romania-en.pdf

European Commission (2020). *Country Report Romania 2020* (SWD (2020) 522 final). Retrieved from https://eur-lex.europa.eu/legal-content/EN/TXT/?qid=1584543810241&uri=CELEX%3A52020SC0522

Eurostat (2018). *Glossary: Activation policies—Statistics Explained*. Retrieved from https://ec.europa.eu/eurostat/statistics-explained/index.php/Glossary:Activation_policies

Fischer, M.M., & Njikamp, P. (1987). Spatial labor market analysis: Relevance and scope. In Fischer, M.M., & Nijkamp, P. (eds.), *Regional Labor Markets. Analytical Contributions and Cross-National Comparisons,* North-Holland Editors.

Fujita, M., Krugman, P.R., & Venables, A. (1999). *The spatial economy: Cities, regions and international trade*. MIT Press.

HG, no. 903, National Mobility Plan, (2016).

Kancs, D. (2014). *Modelling Agglomeration and Dispersion in RHOMOLO*. 31.

Kraak, M.-J. (2017). *The Mapping Challenges of Big Data | ArcNews, The Relevance of Cartography: A Cartographer's Perspective*. Retrieved from https://www.esri.com/esri-news/arcnews/winter17articles/the-mapping-challenges-of-big-data

Lincaru, C., Pîrciog, S., Grigorescu, A., & Stroe, C. (2020). Chapter 4. The Flood Risk Information Used in Spatial Policy-Based Design for Socio-Economic Integration of the Most Vulnerable Persons from Rural Agglomerations. Study Case Romania. In Frederik S. Møller (Ed.), *Public Administration: Perspectives, Management and Challenges*. Niva Science Publisher.

Marshall, A. (1920). *Principles of Economics* (8th Edition). Macmillan and Co.

McHarg, I.L. (1971). *Design with Nature*. New York, NY: John Wiley and Sons.

MMPS (2017). *Buletin statistic în domeniul muncii şi protecţiei sociale în anul 2016 [Statistical bulletin in the field of labor and social protection in 2016]*. Retrieved from http://mmuncii.ro/j33/images/buletin_statistic/ocupare_an2016.pdf

MMPS (2018). *Buletin statistic în domeniul muncii şi protecţiei sociale în anul 2017 [Statistical bulletin in the field of labor and social protection in 2017]*. Retrieved from http://mmuncii.ro/j33/index.php/ro/transparenta/statistici/buletin-statistic/5124

MMPS (2019). *Main social assistance benefits—Number of beneficiaries*. Retrieved from http://www.mmuncii.ro/j33/images/Documente/Familie/Raport_social_122019.pdf

MMPS (2020). *Buletin statistic în domeniul muncii şi protecţiei sociale în anul 2019 [Statistical bulletin in the field of labor and social protection in 2019]*. Retrieved from http://mmuncii.ro/j33/index.php/ro/transparenta/statistici/buletin-statistic/5888

Myrdal, G. (1957). *Economic theory and under-developed regions.* G. Duckworth.

OECDn(2006). *The New Rural Paradigm: Policies and Governance*. OECD.

Perroux, F. (1955). Note sur la notion de pole de croissance? [Note on the Concept of Growth Poles]. *Economic Appliqué*, 307–320.

SDKP (2015). *Sustainable Development Goals*. Sustainable Development Knowledge Platform. Retrieved from https://sustainabledevelopment.un.org/?menu=1300

SNDDR 2030, National Sustainable Development Strategy 2030, Romanian Government, Official Gazette, Part I no. 985bis of November 21, 2018, SNDDR 2030 (2018). https://lege5.ro/App/Document/gmytcojwgizq/strategia-nationala-pentru-dezvoltarea-durabila-a-romaniei-2030-din-09112018

UNSD (2014). *Fundamental Principles of Official Statistics*. Retrieved from https://unstats.un.org/unsd/dnss/gp/fundprinciples.aspx

Annexes

Figure 3. Romania's European network roads
*(https://commons.wikimedia.org/wiki/File:Drumurile_europene_in_Romania.svg#/media/Fişier:D
rumurile_europene_in_Romania.svg)*

Figure 4. Romania's traffic incidents snapshot on 11ᵗʰ of June 2020
(World Traffic Service, ESRI, downloaded)