

Opportunities and Threats of Digitalization in the Governance of Agglomerations

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Abstract: The article connects two complicated problems of the 21st century. The agglomeration governance systems organization and their efficient functioning in large urban regions called often also metropolitan regions and the digitalization in these areas implemented for integration of territories including multiple entities with state and municipal governance powers. The analysis of 7 agglomerations from different countries allows the author to make a far-reaching conclusion that digitalization is only the instrument which the authorities can use for solving the most important matters of city-life. But the implication of this tool depends on the state and municipal political decisions, the resources volume in the region, and its influence on the quality-of-life parameters and their uniformity throughout the territory is not so strong as it is sometimes evaluated. In centralized authoritarian systems (e. g. China and Russia) the IKT technologies develop and are used more effective and spread more rapidly.


1 INTRODUCTION

Agglomerations are at the time the largest urbanized areas in the world. We find such areas with millions of people living in a very densely populated areas all over the world (Loibl et al., 2018). The structure of the settlement system in such areas is very complicated, the quality of life and the population density uneven. The main research question is if the digital technology creates more possibilities for agglomerations' governance or it is a new threat for stability and efficient governance on the territories. The problem is more complicated because of the absence of a formal political and legal status for a whole territory of an agglomeration as a unit. It is also the hurdle in digitalization process: many jurisdictions exist nearby but function separate from others. Through the enlarging of the area, it is crossing administrative and political borders. modified.

2 METHODS AND MATERIALS

Optimal trustworthy results of the research can be gotten based on collaboration of geography, history, sociology, political science, urban studies, economy, and computer science. The geography of urban regions is one of the most crucial frame conditions of the settlement system structure, economic development level and many others. Large territory and uneven parameters of quality-of-life require new integration mechanisms and better communication between economic subjects, political actors, administrative authorities, and the people (Bolter and Robey, 2020).

The representatives of computer science and of the new digital technologies are convinced that digitalization is a straight way to more effective governance in large urban areas. But the results of empirical research do not always confirm the conclusions. Agglomerations try to find out the opportunities of "smart cities" in their areas to create better quality-of-life parameters in all parts of the agglomeration. In this context we think the subjective quality-of-life (the opinion of population) and the views of municipal servants in the area are more important than the

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objective quality-of-life data. (Kuhlmann and Heuberger, 2021).

The research objects are two largest agglomerations of Russia (Moscow and Saint Petersburg) and comparable areas: the agglomeration around Beijing (China), three European agglomerations – London (Great Britain), Métropole du Grand Paris (France), the Capital Region Berlin – Brandenburg (Germany), and the so called Tri-State-New York (United States). The methodological basis is the comparative structural and functional analyses of seven complex agglomeration systems from the point of view of the effectiveness of their governance systems in connection

with the main parameters influencing the quality-of-life. It is made with qualitative and quantitative methods. The structural complexity and the unevenness of the development and of quality-of-life level, the role of the central state government in political and administrative decisions, the problem solution in the more decentralized systems, the rate of municipal autonomy under conditions of democracy and federalism are the research questions as well as the possibilities to level out the common problems of integrating the region into social and economic unit with the introduction of IKT-technologies as an instrument of agglomerations' governance.

Table 1.

N	Name of the agglomeration	Territory	Population / density	Population change patterns
1.	Beijing-Tianjin-Hebei Metropolitan Area, China (Jing-Jin-Ji, 'Jing' 京 for Beijing, 'Jin' 津 for Tianjin and 'Ji' 冀 for the Hebei Province)	217,156 km ² (about 2.2% of the total land area in China)	112mln / 515760/ km ²	Unbalanced growth
2.	Berlin -Brandenburg Metropolregion, Germany Agglomeration Berlin (radius 60 km) Core capital area (Kernraum)	30.546 km ² 3.743,21 km ²	6mln / 200/ km ² 4.469mln	Redistribution 1.194/km ²
3.	Métropole du Grand Paris, France	814 km ²	7,2mln / 8598/km ²	Slight growth
4.	London Metropolitan Area, UK	8,382 km ²	12,653mln / 1510/ km ²	Slight growth, more rapid behind the Green Belt
5.	New York, NY-NJ-PA Metropolitan Area, USA	11,880 km ²	21,045mln / 1,711/km ²	Unbalanced Growth
5.	Moscow Agglomeration, RF	26,000 km ²	20,0mln /3100 / km ²	Rapid Growth, more rapid in the "New Moscow"
7.	Saint Petersburg Agglomeration, RF	SPb 1439 km ² (city) + Leningrad Oblast 84,500 km ²	5, 427mln / 3,708 /km ² + 1,847mln / 20 km ²	Very slight growth

3 RESULTS

First, we analyse the basic parameters of the physical and social space of agglomerations to find out some general and special features important for integration and usage of digital instruments for it. The general information is shown in table 1 and characterizes the extreme diversity in numbers.

It seems that numbers are not so important, but they explain many of constraints on the way of digitalization and the factors which will level out the positive digitalization effects in the case the integration does not happen, and the fragmentation of the agglomeration space stay on the high level. The administrative fragmentation level we can evaluate with the data in table 2. In all systems national governments play an important role not only in policy

area but also developing programmes for quality-of-life parameters improvement and the introduction of IKT into the structure and process. The subnational entities have more powers in federal states and in France (autonomous regions). Municipal autonomy exists in all systems but differs according to the former historical development and national law.

In the 21st century agglomerations must learn to use digitalisation for creating new socio-economic spaces to use the cooperation, coordination, and collaboration instruments for quality-of-life parameters improvement. "Learning regions" is a concept developed in last decades. In all chosen agglomerations many digitalisation projects are developed and implemented, but most of them are initiatives of municipalities (cities, districts). Rare examples we find in city-states (table 3) (Glaeser et al., 2021).

Table 2: Structure of agglomerations, governance instruments General information (created by the author).

Nº	Name of the agglomeration	Types of territorial entities	Number of governance levels	Instruments
1.	Beijing-Tianjin-Hebei Metropolitan Area, China (Jing-Jin-Ji, 'Jing' 京 for Beijing, 'Jin' 津 for Tianjin and 'Ji' 冀 for the Hebei Province)	Province Hebei, Beijing, Tianjin province-level shi (municipality), central cities. 8 Major Prefectural Cities (municipalities) of the Hebei Province, rural localities	3: Central (People's Republic of China' authorities) regional (province, central city – province + municipality), municipality	Regional cooperation and administrative decentralisation. Relocation of the Beijing's municipal governance functions to other entities
2.	Berlin - Brandenburg Metropolregion, Germany	Berlin - city-state, (Stadtstaat), Brandenburg – state (Land). 5 cities, 109 towns, 314 rural settlements. 3 structural spaces: Berlin, surrounding area of Berlin, further Metropolitan area. 2 urban districts, 49 cities and rural settlements.	4 levels: national (federal), subnational (federal states), intermediate municipal (urban districts, districts), municipal (towns and rural settlements)	Economic collaboration, intensive commuting. The division of functions and collaboration in the most important fields. Unification of the public transport system.
3.	Métropole du Grand Paris, France	Métropole du Grand Paris – the intermunicipal entity. The City of Paris, 123 settlements of the des Hauts-de-Seine, de la Seine-Saint-Denis and du Val-de-Marne districts (départements) and 7 settlements de l'Essonne et du Val d'Oise districts.	5: 4 levels: national, subnational (Metropolitan region), intermediate municipal (départements), municipal (communes)	Intermunicipal cooperation and coordination in many function fields. The eleven territorial public institutions defined by decrees.
4.	London Metropolitan Area, UK	The London Metropolitan Region / London Commuter Belt. Greater	3: National, subnational,	<i>Market forces</i> , political ramifications: more

		London, Southeast region, part of the East of England region: 6 counties 168 towns.	intermediate municipal, municipal	social and affordable housing in new towns. Collaboration of the Greater London Authority and authorities in outer parts.
5.	New York, NY-NJ-PA Metropolitan Area, USA	New York, NY-NJ-PA Metropolitan Area – New York City, 3 counties in the state of New York; the five largest cities in New Jersey, and their vicinities; and six of the seven largest cities in Connecticut and their vicinities	4 levels: national (federal), subnational (federal subjects - states), intermediate municipal (subregions with counties), municipal (municipalities, special districts).	Reform of the Regional Transport Authority and reducing of the transport projects costs. Using of the efficient approaches of other regions.
6.	Moscow Agglomeration, RF	Moscow Metropolitan Area (agglomeration). Moscow Federal city (since the 1 st of July 2012 including the so-called New Moscow - with 3 cities and 334 rural settlements), parts of Moscow oblast 5 cities annexed to it and administered within), 4 large nearby towns with population of over 100,000 citizens (Reutov, Zheleznodorozhny, Podolsk and Lubertsy). By several definitions – the whole Moscow oblast: 5990 urban and rural settlements	4 levels: national (federal), subnational (federal subjects), intermediate (districts + intercity administrative areas and settlements), municipal (municipal districts + municipalities of intercity settlements and urban districts).	Not enough efficient planning for integrated development of the whole agglomeration.
7.	Saint Petersburg Agglomeration, RF	Saint Petersburg Federal City: 18 administrative districts and 101 municipalities inside the districts, parts of the Leningrad Oblast with Gatchina, Vsevoloshsk, Kirovsk, Tosno, Vyborg and Lomonosov municipal districts. Inclusion of other municipal districts of the Oblast is possible. The radius of the agglomeration at the time ~ 60 km. Maximal in future – 120 km. But also, in this case, not the whole territory of the Oblast is included.	4 levels in the city of Saint Petersburg: national (federal), subnational (federal subject), intermediate (district), municipal. 4 levels in the Leningrad Oblast (Region): national (federal), subnational (federal subjects), intermediate (municipal district), municipalities.	The strategy 2030 included the paragraph 6.2.3.6 “Development of interaction between Saint Petersburg and the Leningrad Oblast” But it is not there in the later variant up to 2035.

Table 3: Digitalisation projects (created by the author).

N	Name of the agglomeration	Digitalisation projects (PRC -central level)	Regional level (subject of federation, autonomous region)	Municipal level “Smart cities”, rural municipalities
1.	Beijing-Tianjin-Hebei Metropolitan Area, China	Xiong'an New Area (initiated by the head of the state Xi Jinping)	Implemented by the Metropolitan Region, financed by the National Government	Xiong'an New Area – the “the smart city” project, the core of the regional development
2.	Berlin -Brandenburg Metropolregion, Germany	_____	Senate Department for Urban Development and the Environment “Smart Berlin”	Potsdam “Smart City Modellkommune”
3.	Métropole du Grand Paris, France Métropole du Grand Paris	LOI n° 2016-1321 du 7 octobre 2016 pour une République numérique.	« Métropole d’Intelligences »	“Smart and Sustainable City”
4.	London Metropolitan Area, UK	Digitalisation in the UK. The case for a UK framework (blueprint)	Smarter London Together (Strategy for Greater London)	Smart Kingston (the city inside the Commuter Belt)
5.	New York, NY-NJ-PA Metropolitan Area, USA	State of Digital Transformation. Building a Framework for Digital Success	_____	Smart New York City
5.	Moscow Agglomeration, RF	“Electronic Russia”	Smart City Moscow	The sites of the municipalities
7.	Saint Petersburg Agglomeration, RF	“Electronic Russia”	Smart Saint Petersburg	The sites of the municipalities

The only agglomeration with the integrated digital strategy is the Métropole du Grand Paris which has administrative borders, authorities with political and administrative powers for the whole territory. But we must not forget that this territory is only a part of the much larger Capital Region of France and inside the Métropole many communities of different levels do exist including the City of Paris with more than 2mln citizens which has its own Smart City project. The territory of London Commuter Belt is even more disintegrated because of the influence of market forces playing a very important role also in the process of digitalisation. Among territorial entities of the Region the largest is Greater London which has more powers since the devolution process. Different digitalisation strategies are developed in Greater London the last one initiated by the mayor, but Smart city concepts have also smaller cities in the surrounding region. In the Tri-State-New York Metropolitan Region the Regional planning association was established already in the first decades of the 20th century on the initiative

of the business organisations, the municipalities were also intensive involved. 4 Regional Plans created the integrated structure, but the states, counties, and municipalities stay the main political actors and have the right to develop and to implement their own policy. It is important for the Region’ development in all spheres including digitalisation. The main motor of this process is of course the New York City. Germany lags other countries in the development of new IKT first because of its very complicated and detailed legal system. Every innovation needs a new law. The federal structure transfers authority for policy implementation to the subjects of federation (Länder). In the digitalisation process this means more obstacles. There is no federal legal basis for development of digital technologies in the public management and separate projects are developed on the regional (only for Berlin) and municipal level (cities in the Brandenburg Region).

In China (Fang and Yu, 2020) and Russia, the centralisation of power is very high although Russia is a

federal state. The “Electronic Russia” project is a frame for a development in the whole country but Moscow and Saint Petersburg – two largest Russian agglomerations – have their own Smart City projects but only for the federal cities. The cities of the surrounding areas have municipal powers, and their sites include information about the main problems of the local communities. The same digital instruments use the smaller municipalities in the borders of federal cities. The huge Capital Area of China with 100mln citizens develops the “City of the Future Projects” initiated by the head of the state to intensify the development of the whole area and creating a more even quality of life parameters for all people living here.

4 DISCUSSION

Agglomerations as territorial entities are also characterized as metropolitan regions with core-cities of different size. As we have already shown the digitalisation progress depends strong on the type of the governance structure, separation of powers, and decentralisation degree. The summarizing of theoretical concepts we base on the book of the German author Stefan Bege “The Concept of the Metropolitan Region in a Theory and Praxis. Goals, Implementation and Criticism” (Bege, 2010) and on the articles of the European, American and Russian researchers: Lackowska and Norris (Lackowska and Norris, 2017); Pavlov (Pavlov et al., 2019) and others.

In course of case-study analyses are used the “Territorial Agenda of the European Union 2020”, the “Overview of Metropolitan Governance” (Democratic Institutions and Governance Department of Directorate General II - Democracy, in co-operation with Council of Europe), the “Governance of Metropolitan Regions: European and Global Experience”, (Workshop on the "Governance of Metropolitan Regions in Federal Systems), the research results of the “Steering the Metropolis” project that commenced in 2015 (Pavlov et al., 2019); planning documents and governmental acts influencing the metro model development; statistical data.

The development and implementation of metropolitan governance model often fail because of a very narrow ideas or misconceptions about the goals of the governance level functions, the rationality of its structure and mechanisms needed for the efficient results. The way to think about the metropolitan governance object (metropolitan region) as a social space and its straight connection with a physical space parameter but having also independent characteristics allows to

break mentally the political and administrative borders and to create the new multidimensional space where the interconnection of a space of flows and a space of places (Castells., 2020) construct a myriad of parallel existing universes. Each of them has its special juristic and functional laws but there are possibilities if you do not merge all parts into a single system, then can try and unify they through the common goal: a high quality of life in an ever-growing metropolitan region.

Most agglomerations have no fixed borders. But if the border exist it is artificially defined and does not match the actual conditions. To try and establish a formal metropolitan governance system under such circumstances has really no sense. There are no such systems in the metropolises analysed in our research. Only in the Métropole du Grand Paris since 2016 the metropolitan governance system develops according to the new law regulation (Legifrance, 2014). But the results and effects of this are too early to evaluate and are often an open question.

The complex social space of the agglomeration and the wholistic approach to the governance systems issue allow to form the multidimensional socio-political space with parallel “universes” of municipalities, communal, intercommunal functions interconnected through communication channels. Perhaps, exactly the functions placed on the agglomeration governance level play the most important role in the integration and collaboration process. The analyses demonstrate the opportunities of integrated functions fulfilment and the threats during the process for 7 chosen metropolitan regions.

The reasons of failures are multiple. The detailed analyses can be found in the article of Lackowska, M. and Norris, D. F. As the most important are identified the lack of citizens support for agglomeration governance system and the municipalities’ resistance against the functions’ transfer to the agglomeration level because this means the power loss for them (Lackowska and Norris, 2017).

These reasons make the voluntary collaboration of municipalities the most effective and efficient mechanism building agglomerations for creating a better and more unified quality of life on their territory.

Both reasons must be considered by modelling Russian metropolitan governance.

Researchers, politicians, and administrators try to describe, to analyse and to construct the future reality of governance for these huge super complex systems for decades. The common goal of the research and discussion is the need for new and more effective models.

About 20 years ago in the book “The Metropolitan Governance in the 21st century: political aspect” (Vulfovich, 2001) we introduced the notion of “political hyperspace” based on the 10-dimensional space concept of the Japanese physicist Michio Kaku. This multidimensional construct allows to describe a policy and politics in large agglomerations as an interaction between the space of places and the space of flows of Manuel Castells. Linked through the ideas of Pierre Bourdieu about the complicated interaction of social and physical space all these theoretical approaches give us the opportunity to build up an agglomeration governance structured model and to define the role and place of each level and entity governing body in the whole process.

To the political role of modern agglomerations was devoted our article “Agglomerations as a Strategic Actors in a Globalizing World” with the analyses of modern urban development in the mirror of urban and political research (Vulfovich, 2016). Multilevel governance systems are the issue of the article “Cooperation and coordination models in multilevel governance systems through digitalization” (Vulfovich, 2020). The main discussion topic of the material is digitalization as the important mechanism during cooperation and coordination development for agglomerations.

In the article “Metropolitan governance (or not!) in Poland and the United States” Marta Lackowska and Donald F. Norris (Lackowska and Norris, 2017) write about the evolution of “metropolitan thinking” and reform efforts since the 30-s and during the whole 20th century in large metropolitan areas with the goal to overcome the political-administrative fragmentation and its negative externalities. They stress the absence of positive results in European city-regions and in American metropolitan areas as well. But their position and evaluation have as a source the idea about the creation of the institutionalized one-, two- or multilevel system for an entire metropolis. Really agglomerations and the metropolitan regions can be identified as the same areas.

The development of interconnections between governance levels and separate entities in all sectors and across they are a great possibility for “closing the wormholes” (in the terminology of M. Kaku) in the social and physical multidimensional space of the metropolis.

New tendencies in the social development show a great citizens interest in participation in local policy and politics and their demand for independent local problem solving. Boundaries of the agglomerations are steadily moving and with every step outside the

boundaries more municipalities come into the decision-making system of the metropolis. Only flexible and evolution able administration systems can match the development. The new IKT can be used as the most important instrument for creating connection different parts of an agglomeration into the unity. The same idea is a core of the Big-Data technology in many sectors of the urban systems as an example we can see the possibility of better analysis and comparison of services quality based on the International standard ISO 37120.

5 CONCLUSIONS

1). The agglomeration governance system can develop according to the centralized algorithm (Capital Region of China). Deep cleavages in the economy development level, and quality-of-life parameters, problems in the mobility field, and of accessibility of medical and educational institutions problems cannot be eliminated only through digitalization. To answer the challenges the Central Committee of the Communist Party of China created the Plan for Development of China’s Economic Development Zones. In this case a high level of political and administrative centralisation, and intensive financial support from the central level allows the rapid and efficient development and implementation of ambitious projects.

2). If the attempts of merging of the core-city and the surrounding area fail (die Metropolregion Berlin - Brandenburg) strong cooperation efforts of both regions in such sectors as territorial planning, land use with the goal of preserving green spaces around the core-city and economic development, can lead to intensive integration of the agglomeration and support the digitalization process. The further introduction of IKT-technologies into the cooperative relations of all political and administrative actors can change the situation with the digitalization but the German system is not ready for it and the Länder need integrating efforts and financial help from the federal level.

3). The integration of the territory according to the new law (the Métropole du Grand Paris) and the creation of the new political-administrative level of governance can intensify the economic development but does not solve all the problems. Such agglomeration has a complicated territorial structure with many entities. New authorities have their own competences connected mostly with coordination of functions and cooperation in the compliance. But the created system does not match with the broader territorial entity existing for a long time (Île-de-France Region). The multilevel governance system with the national level

at the top is perhaps too complicated to be effective for problem solving of the quality-of-life issues. The decentralization is combined with the centralization in the implementation of large infrastructure and housing projects. But the rights of the municipalities stay intact. The agglomeration has also the integrated digitalization strategy.

4). When market forces are leading in the agglomeration (London Metropolitan Area, “Commuter belt”) the interaction between them and the strong municipalities in the area is a complicated and controversial process. It is doubtful that such construction can be seen as an ideal one and is a good basis for total digitalization.

5). Intensive cooperation and functional coordination of the businesses, municipalities, states (federal subjects) and the federal authorities in the agglomeration (New York, NY-NJ-PA Metropolitan Area) in course of development for decades give good results. The governance system is highly decentralized and has different number of levels in separate parts of the territory, and various structures and regulations. At the time it needs modernization, and the digitalization happens in different parts separately (RPA, n.d.).

6). For a long time, cities were seen in Russia (Moscow and Saint Petersburg) as an appendage to an industrial enterprise. The image was formed in the public consciousness in the centralized Communist Party lead system. It was typical that the cities had neither their own voice nor the right to influence their faith. The notion “agglomeration” officially exists in the Russian system officially only since 2018. At the time both agglomerations have similar governance systems with low level of cooperation and coordination between core cities and their surrounding regions. But there are some important differences between both largest agglomerations of the country first in financial resources they have for development. The digitalization level is higher in Moscow.

Both regions (federal subjects – Moscow and Saint Petersburg) have complicated territorial structure, their own state governments, law systems and budgets. In 2012 territory of the Russia’s capital was enlarged at the cost of the part of the Moscow oblast.

The city of Saint Petersburg was an agglomeration from the first days of its history. Till now the coordination and cooperation efforts between both federal subjects in the area is limited. The cooperation agreement is in the preparation process. Only in the mobility dimension can be seen some results. The autonomous non-profit organization “Directorate for the development of the transport system of Saint Petersburg and the Leningrad Oblast” was created 2013 by the Federal Authorities, Government of Saint Petersburg

and Government of Leningrad Oblast for coordination and cooperation in the transport system and transport infrastructure development of the integrated region including the projects implemented through public-private partnerships (SPBTRD, n.d.).

All samples in the article show common tendencies and special features in the development of the agglomeration’ governance model under different conditions. The first and most important issue is the failure of the metro governance model with definite and rigid structure. Hierarchical levels with the competences divided from the top level are not efficient and have to be changed often according to the changes in national, regional, and global surroundings. But such changes lead to the destruction of the existing system and can lead to the strong negative synergy. Digitalization can play a positive role in the integration process (opportunities) but at the same time it can create conditions for fragmentation and increasing alienation between people (threats).

REFERENCES

- Loibl W., Etminan G., Gebetsroither-Geringer E., Neumann H-M., and Sanchez-Guzman S., 2018. Characteristics of Urban Agglomerations in Different Continents: History, Patterns, Dynamics, Drivers and Trends. *Urban Agglomeration*. doi: 10.5772/intechopen.73524
- Bolter K. and Robey J., 2020. *Agglomeration Economies: A Literature Review* Prepared for The Fund for our Economic Future (FFEF). <https://research.upjohn.org/reports/252>
- Kuhlmann S. and Heuberger M., 2021. Digital transformation going local: implementation, impacts and constraints from a German perspective. In *Public Money and Management*. 25/06/2021. <https://www.tandfonline.com/doi/full/10.1080/09540962.2021.1939584>
- Glaeser E., Kourtit K., and Nijkamp P., 2021. *Urban Empires. Cities as Global Rulers in the New Urban World*. Routledge
- Fang Ch. and Yu D., 2020. *China’s Urban Agglomerations*. Springer
- Bege St., 2010. Das Konzept der Metropolregion in Theorie und Praxis. *Ziele, Umsetzung und Kritik*. Gabler Verlag
- Lackowska M. and Norris D. F., 2017. Metropolitan governance (or not!) in Poland and the United States. *Miscellanea Geographica*, 21(3) URL: https://www.researchgate.net/publication/319012181_Metropolitan_governance_or_not_in_Poland_and_the_United_States
- Pavlov Yu. V., Koroleva E. N. and Evdokimov N. N., 2019. Theoretical Foundations for Organizing the Metropolitan Governance System. *Ekonomika regiona [Economy of Region]*, 15(3), 834-850.

- Gómez-Álvarez D., Rajack R., López-Moreno E., Lanfranchi G. (eds.), 2017. *Steering the Metropolis. Metropolitan Governance for Sustainable Urban Development*. Inter-American Development Bank. URL: https://www.academia.edu/34993307/Steering_the_Metropolis_Metropolitan_Governance_for_Sustainable_Urban_Development
- Castells M., 2020. *Space of Flows, Space of Places: Materials for a Theory of Urbanism in the Information Age*. Routledge.
- Loi de Modernisation de l'action publique territoriale et d'affirmation des métropoles of the 27th January 2014 (in force since 01.01.16). — URL: <https://www.legifrance.gouv.fr/affichTexte.do?cidTexte=JORFTEXT000028526298>
- Lackowska M. and Norris D. F., 2017. Metropolitan governance (or not!) in Poland and the United States. *Miscellanea Geographica* **21**(3) URL: https://www.researchgate.net/publication/319012181_Metropolitan_governance_or_not_in_Poland_and_the_United_States
- Vulfovich R. M., 2001. *Metropolitan Governance in the XXI Century: Political Aspect*. Saint Petersburg, The Herzen University Publishing.
- Vulfovich R. M., 2016. *Agglomerations as a Strategic Actors in a Globalizing World // Voprosy Gosudarstvennogo i Munitsypalnogo Upravleniia* (Public Administration Issues. 2016. N5. P.119-137).
- Vulfovich R. M., 2020. Cooperation and coordination models in multilevel governance systems through digitalization. In: Gerasimov, V I (ed.) *Russia: Development Tendencies and perspectives. Materials of the 19th National scientific conference with international participation*. Part I. RSA. Moscow, pp. 650-656. URL: <http://inion.ru/ru/about/news/rossiia-tendentsii-i-perspektivy-razvitiia-ezhegodnik-vyp-15/>
- Lackowska M. and Norris D. F., 2017. Metropolitan governance (or not!) in Poland and the United States. *Miscellanea Geographica* **21**(3) URL: https://www.researchgate.net/publication/319012181_Metropolitan_governance_or_not_in_Poland_and_the_United_States
- A Region at Risk. The Third Regional Plan for New York – New Jersey – Connecticut Metropolitan Region. URL: <http://library.rpa.org/pdf/RPA-Plan3-A-Region-at-Risk.pdf>
- Directorate for the development of the transport system of Saint Petersburg and the Leningrad Oblast. URL: <http://spbtrd.ru/directional/>