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ASSESSMENT OF THE UKRAINIAN REGIONAL INFRASTRUCTURE DEVELOPMENT TAKING INTO ACCOUNT ITS INCLUSIVENESS

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Summary. *The main ideas and principles of inclusive development are revealed in this paper. It is proved that the main condition for the transition of the Ukrainian regions to the principles of inclusive growth is the provision of developed inclusive infrastructure. The purpose of the paper is to substantiate the system of quantitative indicators that reflect the prospects for achieving the goals and objectives of infrastructure development in the region as an important component and prerequisite for inclusive growth. Based on the methodology proposed in the paper, the analysis of infrastructural development of the Ukrainian regions as a basis for inclusive growth is carried out. It is proved that in order to involve the maximum number of the population in the development processes, it is necessary to create appropriate conditions, which are provided by the developed infrastructure. Due to indicators of construction development, transport infrastructure, passenger and cargo turnover, the level of the population coverage with Internet services, preschool educational institutions for children; development of higher education, accessibility of medical services and health care, an index of infrastructural development of the region has been formed, which reflects the possibility of including all segments of the population in productive activities and creating conditions for growth. Significant asymmetry of infrastructural development between the regions of Ukraine has been revealed, which puts them in unequal conditions for achieving inclusive growth. It is stated that the solution of this problem is possible only with the active state support and improvement of mechanisms for financing regional development projects from the State budget. The main results presented in the paper are obtained during the research «Fiscal space of inclusive development of the region» and «Security of sustainable development of regions and territorial communities of Ukraine in the context of decentralization on the basis of inclusive growth», within which the author systematizes goals, objectives and indicators of quantitative assessment of the achievement of prospects for regions inclusive development.*

Key words: *region, inclusive development, infrastructural development of the region, asymmetry of development, state support of development.*

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ОЦІНЮВАННЯ РОЗВИТКУ ІНФРАСТРУКТУРИ РЕГІОНІВ УКРАЇНИ З УРАХУВАННЯМ ЇЇ ІНКЛЮЗИВНОСТІ

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Резюме. *Розкрито основні ідеї та принципи положення інклюзивного розвитку. Доведено, що основною умовою переходу регіонів України на засади інклюзивного зростання є забезпечення розвинутої інклюзивної інфраструктури. Метою статті є обґрунтування системи кількісних індикаторів, що відображають перспективи досягнення цілей та завдань розвитку інфраструктури регіону на засадах її інклюзивності. У процесі проведеного дослідження використано методи системного аналізу, синтезу та узагальнення – у процесі розкриття методичних засад оцінювання інфраструктурної складової інклюзивного розвитку регіонів; статистичний, графічний та інтегрального аналізу – для оцінювання рівня розвитку інфраструктури регіонів. На основі запропонованої у статті методики здійснено аналіз інфраструктурного розвитку регіонів України як основи інклюзивного зростання. Доведено, що для залучення максимальної кількості населення до процесів розвитку необхідним є створення відповідних*

умов, що забезпечує розвинена інфраструктура. На основі показників розвитку будівництва, транспортної інфраструктури, пасажиро- та вантажообороту, рівня охоплення населення інтернет-послугами, дошкільними навчальними закладами дітей; розвитку вищої освіти, доступності сфери медичного обслуговування та охорони здоров'я сформований індекс інфраструктурного розвитку регіону, який відображає можливість включення усіх верств населення до продуктивної діяльності та створення умов для зростання. Виявлено значну асиметрію інфраструктурного розвитку між регіонами України, що ставить їх у нерівні умови для досягнення інклюзивного зростання. Стверджується, що вирішення цієї проблеми можливе лише за активної державної підтримки та вдосконалення механізмів фінансування проектів регіонального розвитку з державного бюджету. Основні результати, викладені у статті, отримано під час виконання науково-дослідної роботи «Фіскальний простір інклюзивного розвитку регіону», а також держбюджетної теми «Безпека сталого розвитку регіонів та територіальних громад України в умовах децентралізації на засадах інклюзивного зростання», у межах яких автор систематизував цілі, завдання та показники кількісного оцінювання досягнення перспектив забезпечення інклюзивного розвитку регіонів.

Ключові слова: регіон, інклюзивний розвиток, інфраструктурний розвиток регіону, асиметрія розвитку, державна підтримка розвитку.

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Introduction. Inclusive development of the region is a process of achieving comprehensive qualitative and quantitative changes in the spatial system, based on economic development by increasing the involvement of the population in productive activities, forming an accessible infrastructure of the region to create equal opportunities for personal development and equitable distribution. raising, reducing the level of differentiation of the population, and increasing the level of its welfare [1].

The state of infrastructure is an important factor and at the same time the result of effective management of the region's development, its inclusive focus. The components of the infrastructure complex create conditions for full use of labour potential and social inclusion in order to overcome poverty, increase the availability of socio-economic growth for the majority of the population, and are the main elements that can bring our country to a new level of development. The role and importance of infrastructure in achieving the inclusive development of the regions of Ukraine necessitates an in-depth analysis of its current state, identifying interregional disparities and identifying problems that need to be addressed urgently.

Review of the latest research and literature. Conceptual principles of inclusive development of regions and its infrastructural provision were defined in the works of many Ukrainian economists, in particular: O. Vasyliuk, N. Vynar, V. Dubnytskyi, O. Pasternak, H. Prytula [2; 3] and others. The works of domestic and foreign scientists address the issues of reducing the impact of the economic crisis on the development of regions, the formation of infrastructure, the social orientation of economic growth.

As practice shows, modern development is asymmetric. The fast-growing economies of a number of countries are increasingly faced with the deepening of socio-economic inequality and the problem of social isolation in the development process [4]. Such trends have led to the spread of research in the economic literature of inclusive growth and focus on equal access to health services, human capital development, compliance with a satisfactory environmental environment, improving social protection, and food security as global security factors in a broad sense [4; 5; 6; 7]. However, the issues of development and impact of the region's infrastructure on ensuring its inclusive growth have been little studied.

Main purpose of the paper is to analyse the infrastructural development of the region as an important component and prerequisite for inclusive growth.

Statement of the task. The following scientific tasks have been set out to achieve the target goal: to reveal the essence of regions inclusive growth and justify the importance of infrastructure; to assess the regions infrastructure taking into account its inclusiveness; calculate

the index of regions infrastructural development taking into account its inclusiveness; give recommendations for further development of Ukraine regions inclusive infrastructure.

Statements of main issues of the investigation. In recent years, the concept of inclusive growth has become more widespread, based on improving the welfare and quality of life of the population through maximum involvement of various segments of society in development processes, creating equal opportunities for personal growth and equitable distribution of benefits. The transition to inclusive development in Ukraine requires the formation of a favourable institutional environment and the implementation of appropriate regulatory, economic and infrastructural measures, giving special importance to infrastructure as a necessary condition for inclusiveness and sustainable growth [5, p. 71]. It is a developed infrastructure accessible to all segments of the population that can provide equal access to resources, including information, establish communication, and expand opportunities for personal growth.

Theoretical development of science and empirical research suggest that there is a link between infrastructure development and inclusive growth. The problem of inequality, i.e. the low degree of inclusiveness of economic growth, is most acute in countries with underdeveloped infrastructure networks. Such countries spend significantly more on subsidies and transfers than on public investment to expand infrastructure networks, the education system (there are studies showing that educational infrastructure affects economic growth even more than the road network), and health care [6].

Inclusive infrastructure enhances social inclusion and ensures that the benefits of infrastructure development can be enjoyed by all individuals, communities or social groups.

To ensure access to infrastructure and its benefits for all segments of society, it is important to identify those economic actors and stakeholders at risk of exclusion. Stakeholders are generally considered to be the person, group, community or organization affected or likely to be affected by the implementation of the infrastructure project. also, for people who often risk limited access to the benefits of infrastructure development [8].

Based on the approved national system of sustainable development goals, we will define the guidelines for inclusive development of the infrastructure of the regions (Table 1).

Table 1. Guidelines for inclusive development of regional infrastructure

Goals	Task	Indexes	Positive dynamics of the indicator
1	2	3	4
Development of infrastructural types of economic activity	Develop quality and affordable infrastructure based on construction development	Index of construction products	↑
	Ensure the development and accessibility of road transport infrastructure	The density of public roads with a hard surface	↑
		Freight turnover, million t/km	↑
		Passenger turnover million passes/km	↑
		Share of public transport vehicles that consider the needs of people with disabilities, %	↑
	Share of public and civil facilities, landscaping, transport infrastructure, road service, equipped considering the needs of the disabled, %	↑	

(to be continued)

	Ensure Internet access, especially in rural areas	The level of coverage of the population with Internet services, subscribers per 100 inhabitants	↑
		The proportion of the population who reported using Internet services in the last 12 months, %	↑
Accessibility and high level of education of the population	Ensure the availability of quality preschool development for all children	Level of coverage of children aged 5 years by preschool educational institutions, %	↑
	Create modern learning conditions in schools, including inclusive, based on innovative approaches	Share of rural full-time secondary schools with Internet access, %	↑
		Share of full-time secondary schools in which inclusive education is organized, %	↑
Ensure a high level of education of the population	Number of university students per 1,000 population	↑	
Affordable and quality health care	Ensure that health services are available	The proportion of households affected by the unavailability of medical services, %	↓
		Number of doctors per 1,000 people	↑
		The proportion of rural households affected by deprivation due to lack of regular daily transport connections with other settlements with developed infrastructure, %	↓
Justice and inclusive institutions for urban and community development	Creating inclusive institutions for the development of communities and territories on the basis of integrated planning and management with public participation	The proportion of regions that have approved and implemented regional development strategies and action plans for their implementation, developed with public participation, %	↑
	To increase the efficiency of public authorities and local self-government	Share of the population satisfied with recent experience in using public services, %	↑
	Increase confidence in the judiciary and ensure equal access to justice	Level of public confidence in the court, %	↑
		Level of awareness of citizens about the right to free legal aid, %	↑
Reduce corruption	Corruption rate in the public sector	↓	

*Systematized by the author according to the data: [9].

Note that the set of indicators of inclusive development of the region is not homogeneous. They are measured in different quantities and are multidirectional, i.e. the increase of some has a positive effect on inclusive growth (GDP growth, the volume of export-import operations, change in the number of active enterprises, etc.), while the growth of others, on the contrary, may worsen the situation. housing stock, growth in the number of registered unemployed, etc.).

Therefore, the obligatory stage of the analysis of the processes of inclusive development of regions is to bring the initial data to a commensurable form. According to this approach, all the original data are translated into coefficients, the value of which varies from 1 to 0, ($K_i \in [0; 1]$). The largest value of the i-th factor is equated to one, the smallest – to zero.

To calculate the index of inclusive infrastructure development, we use the formula of the root mean square, calculated on the basis of normalized indicators, which allows considering the magnitude of variation of the partial indicators considered.

The state of infrastructure is an important factor and at the same time the result of

effective management of the region's development, its inclusive focus. The components of the infrastructure complex create conditions for full use of labour potential and social inclusion in order to overcome poverty, increase the availability of socio-economic growth for the majority of the population, and are the main elements that can bring our country to a new level of development, ensuring its inclusiveness.

Among the indicators of infrastructure development, it should be noted the growth rate of commissioned housing, the analysis of which shows the lack of a clear trend. With the beginning of financial decentralization in 2015, the residential real estate market grew, however, starting in 2016, the situation changed to the opposite. One of the reasons for the change in the intensity of housing construction can be called a long cycle between the start of housing construction and its readiness for use. During the study period, only in three regions, there was a steady increase in the number of commissioned housing (Kyiv, Kharkiv, and Volyn regions).

The index of construction products in almost all regions in 2015 was less than one, and in 2016–2017 showed growth. This indicates an increase in the volume of construction of buildings, structures, engineering structures after the crisis of 2015. There are no clear territorial differences in the performance of construction and installation works by region, except for the lowest rates in Donetsk and Luhansk regions.

Assessing inclusive development through access to health care services, we note that the number of hospitals and outpatient clinics in the regions of Ukraine has been gradually increasing, with the largest growth observed in Kyiv. These changes are due to the proliferation of private hospitals, which we believe will continue to grow as health care reform continues.

The number of places in secondary schools increased in almost all regions of Ukraine. The fastest growth rates of this indicator are in the western regions, as well as in Kyiv and Kyiv region. However, despite the actual increase, the problem of providing children with preschool education remains relevant in most regional centres. The development of infrastructure at different levels of the educational process takes place with different intensity. Such large cities are centres of higher education, so the number of students per 1,000 population is relatively higher.

One of the indicators of ensuring the availability of social services is the share of households that have suffered deprivation due to the lack of timely ambulance services in the village. In 2018, the lowest value of this indicator was observed in the Kirovohrad region (0.8%). Residents of Zakarpattia region (87.9%) were the least provided with timely ambulance services. Thus, according to the indicators of availability of medical services in 2018, the worst situation is observed in agricultural and agroindustry regions due to the predominance of the rural population and low density of its residence [3, p.40].

In accordance with the guidelines for inclusive development of infrastructure in the regions and the available data of official statistics, the relevant indicators were selected, after the selection and grouping of which the integrated index of inclusive infrastructure development in the region was calculated.

The calculation of the indicator of inclusive infrastructure development (IID) is based on the assessment of the following parts: construction component (construction products index); transport component (density of public roads with a hard surface cargo turnover; passenger turnover); component of communication (level of coverage of the population with Internet services); educational component (level of coverage of preschool educational institutions of children aged 5 years; the number of university students per 1000 population); medical component (share of households affected by the unavailability of medical services; the number of doctors per 1,000 people) (Table 2).

Table 2. Index of inclusive infrastructure development of the regions of Ukraine

Regions	2013	2014	2015	2016	2017	2018	Average	Average for the reform period (2015–2018)
1	2	3	4	5	6	7	8	9
Vynnytsia	0,480	0,501	0,511	0,553	0,460	0,569	0,512	0,523
Volyn	0,396	0,423	0,525	0,441	0,426	0,461	0,445	0,463
Dnepropetrovsk	0,614	0,658	0,593	0,559	0,656	0,622	0,617	0,608
Donetsk	0,723	0,608	0,377	0,388	0,411	0,493	0,500	0,417
Zhytomyr	0,498	0,500	0,481	0,559	0,533	0,497	0,511	0,517
Transcarpathian	0,415	0,454	0,528	0,481	0,524	0,377	0,463	0,478
Zaporozhzhia	0,495	0,467	0,473	0,431	0,491	0,476	0,472	0,468
Ivano-Frankivsk	0,365	0,435	0,466	0,402	0,448	0,413	0,421	0,432
Kyiv	0,657	0,596	0,638	0,638	0,591	0,618	0,623	0,621
Kirovograd	0,508	0,485	0,488	0,472	0,554	0,452	0,493	0,491
Luhansk	0,488	0,343	0,331	0,376	0,356	0,338	0,372	0,350
Lviv	0,687	0,703	0,735	0,671	0,640	0,613	0,675	0,665
Mykolaiivska	0,439	0,458	0,490	0,451	0,448	0,434	0,453	0,456
Odessa	0,486	0,547	0,542	0,608	0,608	0,562	0,559	0,580
Poltava	0,674	0,628	0,584	0,555	0,541	0,546	0,588	0,557
Rivne	0,444	0,484	0,432	0,424	0,511	0,534	0,472	0,475
Sumy	0,457	0,531	0,477	0,470	0,470	0,471	0,479	0,472
Ternopil	0,547	0,568	0,560	0,588	0,572	0,529	0,561	0,562
Kharkiv	0,558	0,585	0,569	0,609	0,561	0,547	0,571	0,572
Kherson	0,498	0,509	0,470	0,444	0,413	0,364	0,449	0,423
Khmelnysky	0,631	0,577	0,595	0,547	0,569	0,567	0,581	0,570
Cherkasy	0,564	0,559	0,520	0,508	0,490	0,517	0,526	0,509
Chernivtsi	0,656	0,583	0,588	0,565	0,597	0,568	0,593	0,579
Chernihiv	0,350	0,359	0,326	0,350	0,377	0,350	0,352	0,351
Kyiv city	0,779	0,879	0,842	0,860	0,844	0,855	0,843	0,851

*Indicators of education and highways are not taken into account due to the lack of statistical data at the time of calculation;

**calculated by the author according to the data [10].

The integrated indicator of inclusive infrastructure reflects the level of its accessibility for the whole population, special attention needs to be paid to risk groups – the population that is excluded or in unequal conditions in the process of finding or employment, using the benefits of infrastructure development, meeting personal development needs. In particular, such risk groups are formed by socially unprotected population – on the basis of income level (low-income); persons with special needs (disabled); by gender (mostly women); population living in remote areas (rural population), etc. Developed and accessible infrastructure creates favourable conditions for personal development of all members of society, more fully meet their needs in education, culture, health care; provides access to information and strengthens communication between members of society, economic entities; forms the material basis for socio-economic growth in the country, regions, communities. All this in combination is a prerequisite for maximum involvement of the population in socially useful activities and their personal development as components of social welfare.

As a result, in 2013–2018, the best indicators of inclusive infrastructure development were in Lviv, Dnipropetrovsk region, and the city of Kyiv, and the worst in Luhansk, Chernihiv, Donetsk, and Kherson regions (Fig. 1).

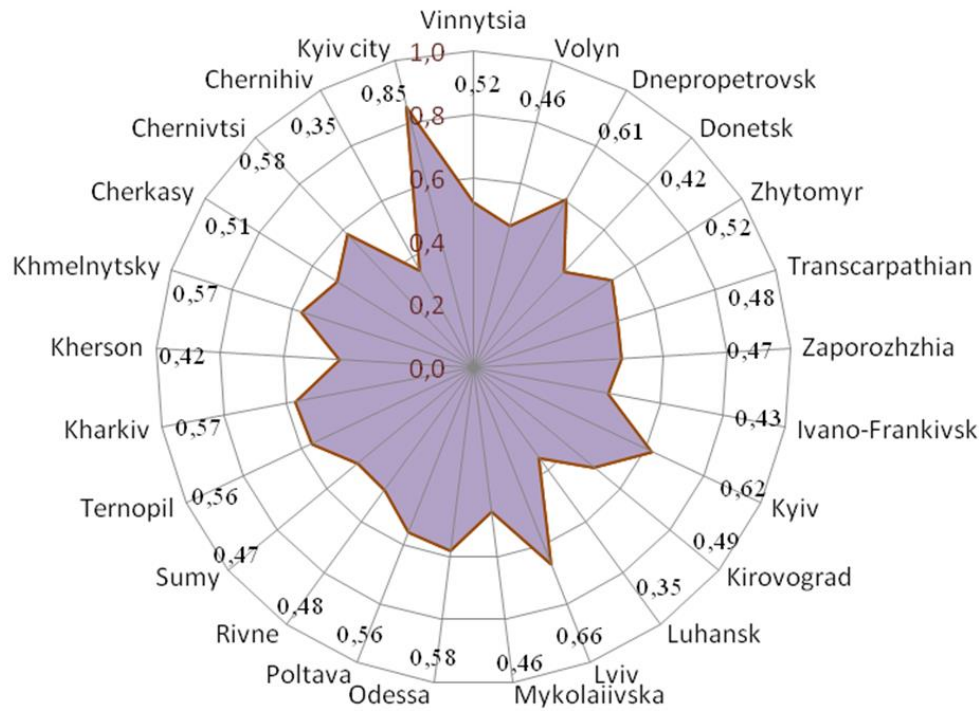


Figure 1. *Asymmetry of inclusive infrastructure development at regions of Ukraine on average for the period 2015–2018*

*Built by the authors.

The calculations show that there is a significant asymmetry of infrastructure development between the regions of Ukraine, which puts them in unequal conditions to achieve inclusive growth. The solution to this problem is possible only with active state support and balanced regional policy.

Conclusions. 1. The demand for time today for Ukraine is the transition to the principles of inclusive growth. The essence of the inclusive growth of regions is revealed and the exceptional importance of infrastructure for its achievement is substantiated. It is proved that in order to involve the maximum number of the population in the development processes, it is necessary to create appropriate conditions provided by the developed infrastructure. 2. The scientific and methodological approach to the assessment of the infrastructure of the regions as a condition for their inclusive growth has been developed. The systematization of goals, objectives, and corresponding indicators that allow to quantify the prospects of achieving the benchmarks of inclusive infrastructure development of the regions is carried out. The calculation of an integrated indicator of inclusive infrastructure is proposed, which makes it possible to identify the level of infrastructure development in the region in accordance with the requirements of inclusive growth and to identify interregional disparities in this area. 3. The index of infrastructural development of the region is formed, which is based on the index of construction products; density of public roads with hard surface; freight turnover; passenger turnover; the level of coverage of the population with Internet services; the level of coverage of preschool educational institutions; the number of university students; the share of households affected by the unavailability of medical services; the number of doctors in the calculation. Based on the analysis, a significant asymmetry of infrastructural development between the regions of Ukraine is revealed, which proves the need to introduce a balanced state policy to support regional growth. 4. Prospects for further research are the in-depth analysis of the

economic and social components of inclusive development of the regions of Ukraine, the comprehensive results of which will form the basis for developing organizational and economic mechanisms of inclusive development of the region in decentralization.

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