WAYS OF DEVELOPING INFRASTRUCTURE FOR REDUCING POVERTY IN THE REGION (CASE OF BUKHARA REGION)

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Annotation. This thesis examines infrastructure development as a key socio-economic mechanism for reducing poverty at the regional level, using the case of Bukhara region. The author proposes and tests the original “5I model” (Investments – Infrastructure – Inclusion – Innovation – Income). Through regression analysis of 2019-2024 data for 11 districts, the study quantifies the elasticity of poverty with respect to infrastructure investment and identifies inter-district inequality as a structural driver of poverty.

Keywords: regional economy, poverty reduction, infrastructure, investment, 5I model, Bukhara region, territorial inequality, public-private partnership.

Аннотация. В тезисах рассматривается развитие инфраструктуры как механизм сокращения бедности на примере Бухарской области. Автор предлагает оригинальную «модель 5I», на основе регрессионного анализа данных 2019-2024 гг. по 11 районам количественно оценена эластичность бедности по инфраструктурным инвестициям.

Ключевые слова: региональная экономика, сокращение бедности, инфраструктура, инвестиции, модель 5I, Бухарская область, ГЧП.

Аннотация. Тезисда минтақавий миқёсда камбағалликни қисқартириш механизми сифатида инфратузилмани ривожлантириш Бухоро вилояти мисолида ўрганилган. Муаллифнинг “5I модели” асосида 2019-2024 йй. маълумотлари

бўйича 11 туман кесимида камбағалликнинг инфратузилма инвестицияларига нисбатан эластиклиги баҳоланган.

Калит сўзлар: минтақавий иқтисодиёт, камбағаллик, инфратузилма, инвестиция, 5I модели, Бухоро вилояти, ДХШ.

Globally, poverty reduction is one of the central objectives of the UN Sustainable Development Goals (SDG 1), which aim to halve the share of people living in poverty by 2030. According to the World Bank (2024), 8.5% of the world’s population still lives on less than 2.15 USD per day. Empirical studies by Aschauer (1989) and Calderón and Servén (2014) have demonstrated that public investment in infrastructure is strongly associated with poverty reduction, particularly in lagging regions. In Uzbekistan, the “Uzbekistan – 2030” strategy targets a national poverty rate of 7% by 2030. In Bukhara region, the rate stood at 9.8% in 2023, with significant inter-district disparities: Gijduvan and Karakol districts exceed 12%, while districts near Bukhara city fall to 6-7%.

To analyse this heterogeneity, the author proposes the original “5I model”, which constitutes the principal scientific novelty of the dissertation. The model integrates five interrelated components: (1) Investments — concentration of public and private capital through public-private partnership (PPP); (2) Infrastructure — coordinated development of transport, energy, water, digital and social infrastructure; (3) Inclusion — purposeful engagement of low-income households, women and youth; (4) Innovation — adoption of digital platforms, green energy and smart-region technologies; (5) Income — creation of stable employment through agribusiness, tourism and SMEs.

The current state of infrastructure in Bukhara region reveals several structural problems. The length of hard-surface motor roads exceeds 1,180 km, yet 28% of intra-district roads require reconstruction. Electricity coverage stands at 99.4%, but grid losses reach 13.2%. Access to safe drinking water is 92% in urban areas and only 71% in rural

areas, directly affecting health outcomes and the productivity of agriculture and rural tourism. Mobile coverage reaches 98.7% and 4G coverage 84.5%, yet in remote districts average internet speed is 32% lower than the national average, generating a measurable digital divide that perpetuates poverty among rural households.

To quantify the relationship between infrastructure investment and poverty, the author conducted a multiple regression analysis using 2019-2024 panel data for 11 districts of Bukhara region. The dependent variable is the district-level poverty rate; explanatory variables include per capita infrastructure investment, road density, water and energy coverage, and a digital access index. The estimated model yields $R^2 = 0.776$, $F = 3.469$, $p < 0.1$, indicating that approximately 77.6% of the variation in poverty across districts is explained by infrastructure indicators. A 1% increase in per capita infrastructure investment is associated with a 0.34% decrease in the poverty rate, ceteris paribus.

International experience confirms the relevance of the 5I approach. China’s Western Development Strategy reduced rural poverty in western provinces from 18.7% in 2001 to 1.7% in 2020. Turkey’s GAP project integrated irrigation, energy and transport across nine south-eastern provinces and increased regional GDP per capita by 209% over two decades. India’s Pradhan Mantri Gram Sadak Yojana (PMGSY) connected over 167,000 villages to all-weather roads and produced a poverty reduction of 11-15% in beneficiary villages. These cases collectively demonstrate that targeted, geographically prioritised infrastructure programmes can reduce regional poverty by 25-40% within 10-15 years.

The study supports the following conclusions. First, sustainable poverty reduction at the regional level cannot be achieved through social transfers alone; it requires the systematic creation of economic opportunities via integrated infrastructure

development. Second, inter-district infrastructure inequality is one of the principal structural drivers of poverty in Bukhara region, and overcoming it requires a “poverty-map-based” targeted investment strategy rather than uniform allocation. Third, the proposed 5I model functions as a practical analytical and policy tool, linking investment decisions to measurable poverty outcomes. Fourth, investments in digital infrastructure and green energy represent the most promising long-term directions for poverty reduction. Fifth, by combining PPP mechanisms with targeted infrastructure programmes and adaptation of international best practices, Bukhara region can realistically reduce the poverty rate to 6% by 2030.

References

1. Decree of the President of the Republic of Uzbekistan No. PF-158 of 11 September 2023 “On the Uzbekistan – 2030 Development Strategy”.
2. World Bank. Poverty and Shared Prosperity 2024: Pathways Out of the Polycrisis. – Washington, DC: World Bank, 2024. – 184 p.
3. Aschauer D.A. Is Public Expenditure Productive? // Journal of Monetary Economics. – 1989. – Vol. 23, №2. – P. 177-200.
4. Calderón C., Servén L. Infrastructure, Growth, and Inequality: An Overview // World Bank Policy Research Working Paper. – 2014. – №7034. – 39 p.
5. Estache A. Infrastructure Finance in Developing Countries: An Overview // EIB Papers. – 2010. – Vol. 15, №2. – P. 60-88.
6. Statistical data of the Bukhara Regional Department of Statistics, 2019-2024. – URL: https://buxoro.stat.uz