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Article

A Targeted Mechanism for Regional Poverty Reduction: Methodology of the Poverty Reduction Potential Index (Prpi) for the Mahallas of the Bukhara Region

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Abstract: This article addresses one of the most pressing problems of regional anti-poverty policy - the efficient allocation of limited public resources. The purpose of the study is to develop an original composite indicator, the Poverty Reduction Potential Index (PRPI), that quantifies the poverty-reduction potential of individual mahallas (neighbourhood communities), and to build on it a targeted, differentiated intervention mechanism. Methodologically, the PRPI aggregates ten indicators grouped into three blocks - need, economic potential and social infrastructure - using min-max normalisation and expert-analytical weighting on a (0;10) scale. The methodology was tested on passport and household-registry data for 516 mahallas of the Bukhara region. The results show that only 0.97% (5) of mahallas fall into the high-potential group, 5.23% (27) into the medium group, 45.93% (237) into the low group and 47.87% (247) into the very-low group, empirically confirming the inefficiency of a uniform (one-size-fits-all) transfer policy. Based on these results, a differentiated mechanism is proposed for the four groups, structured into short-, medium- and long-term phases with clearly assigned responsible institutions and monitoring criteria. The scientific novelty of the article lies in the dynamic group-transition design of the index, which makes it replicable in other regions.

Keywords: Poverty reduction, targeted mechanism, composite index, community-level targeting, differentiated policy, Bukhara region, social protection

1. Introduction

The effectiveness of poverty-reduction policy depends not only on the volume of allocated resources but also on how precisely those resources are targeted. International practice distinguishes two types of targeting error: inclusion error (resources directed to a non-poor area) and exclusion error (a genuinely needy but statistically "invisible" area being overlooked). Both errors reduce the social efficiency of limited public resources. Uzbekistan's recent social-protection reforms - including the "Iron Notebook" (Temir Daftar), "Women's Notebook" and "Youth Notebook" registries, together with the "From Poverty to Prosperity" state program adopted under Presidential Resolution PP-330 [1] - are aimed at ensuring targeting at the level of the individual household. Practice shows, however, that alongside household-level targeting, the institutional mechanism of geographic (territorial) targeting - which determines which territorial unit (mahalla) should receive resources first - remains underdeveloped.

The theory of poverty measurement has a long history. The earliest quantitative studies relied on the monetary (income-based) approach pioneered by B. Rowntree and C. Booth. Since the late twentieth century, the capability approach proposed by A. Sen has substantiated the need to interpret poverty not merely as an income shortfall but as an individual's inability to achieve basic functionings. Building on this theoretical foundation, S. Alkire and J. Foster developed the "dual cutoff" identification method [2] and the Mα class of aggregation [3] - itself an extension of the decomposable poverty-measure class of J. Foster, J. Greer and E. Thorbecke [4] - which underpin contemporary multidimensional poverty indices, including the Global Multidimensional Poverty Index applied by UNDP and OPHI. As shown by A. Atkinson [5] and by F. Bourguignon and S. Chakravarty [6], the central methodological challenge of multidimensional measurement lies in choosing the weighting and aggregation method for the component indicators, a challenge comprehensively synthesized in the reference volume by Alkire and colleagues [7].

Nearly all of the approaches listed above, however, are designed to identify poverty at the individual or household level and do not directly answer the question of which territorial unit should receive limited resources first. To fill this gap, the international literature has developed the fields of geographic targeting and poverty mapping. The key methodological advance in this area is the small-area estimation (ELL) method proposed by C. Elbers, J. Lanjouw and P. Lanjouw [8], which combines survey and census data to estimate poverty indicators for very small territorial units. The ELL method, however, first requires complex statistical modelling and high-quality survey data, and second, serves primarily to "measure" the level of poverty rather than to assess the "intervention potential" needed for resource allocation.

In the conditions of Uzbekistan, and of the Bukhara region in particular, the mahalla is not merely a statistical unit but also an institutional governance unit: each mahalla maintains a database through the passport and household-registry (ombor daftari) system [9]. This makes it possible to design a territorial-targeting methodology that is adapted to national conditions, based on administrative rather than survey data, and both simple and replicable. At the same time, the existing literature - including B.N. Navruz-Zoda's seven-level classification of poverty (mega, macro, meso, meta, micro, mini, mono) [10] and Sh.N. Xayitov's monetary (quasi-Leyden-line-based) approach for the districts of the Bukhara region [11] - has not produced a composite targeting index at the mahalla level. The author's own earlier research has examined related aspects of the region's poverty profile - the theoretical-conceptual foundations of poverty [12], the current state and structural characteristics of poverty across the Bukhara region [13], district-level opportunities for poverty reduction and employment promotion [14], and household-level living standards based on survey data [15] - yet none of these studies proposed a composite mahalla-level targeting index. This precise gap defines the relevance of the present study.

The purpose of the study is to develop an original composite index (PRPI) that quantitatively differentiates the poverty-reduction potential of the mahallas of the Bukhara region, to validate it using data from 516 mahallas, and to formulate, on the basis of the results, a targeted mechanism that classifies mahallas into groups and is implemented in stages. The research objectives are: (1) to scientifically substantiate the indicators and weights of the Need, Economic Potential and Social Infrastructure blocks; (2) to formalize the normalization and aggregation algorithm; (3) to test the methodology on real data and classify the mahallas; and (4) to develop, on the basis of the classification results, an institutionally feasible differentiated mechanism.

2. Materials and Methods

The object of the study comprises the 516 citizens' self-governing bodies (mahallas) of the Bukhara region. The data sources are each mahalla's passport data (demographic and economic statistical records) and household registry - ombor daftari (household-level

wealth and need indicators). The general scientific methods employed include comparative analysis, statistical grouping, min–max normalization, expert-analytical weighting and typological classification.[16]

The Poverty Reduction Potential Index (PRPI) combines three conceptual blocks: Need (N), Economic Potential (EP) and Social Infrastructure (SI). Following the aggregation principle emphasized by F. Bourguignon and S. Chakravarty, the core idea of the methodology is that a high value on one dimension (e.g., high need) is not automatically "offset" by a low value on another dimension (e.g., low economic potential); instead, priority is given to territories where both blocks are simultaneously high. This approach addresses two errors common in traditional social programs: directing resources solely to a needy but low-potential area (which yields poor results), and directing resources to a high-potential area with only a minor problem (which yields low impact).

Stage 1. Normalization of indicators

The ten initial indicators, measured in different units, are converted to a comparable (0;10) scale using the min–max method:

$$x_{i,j}^{*} = \frac{x_{i,j} - min_j(x_{i,j})}{max_j(x_{i,j}) - min_j(x_{i,j})} \times 10 \qquad (1)$$

where x*i,j is the normalized value of indicator *i* for mahalla *j*; xi,j is the raw value of indicator *i* in mahalla *j*; and minj(xi,j) and maxj(xi,j) are, respectively, the smallest and largest region-wide values of indicator *i*.

Stage 2. Block indicators and weights

The Need block (N) comprises three indicators: the share of the poor population (N1, weight 15%), the density of material-assistance recipients (N2, weight 10%) and the share of unsupported dependants (N3, weight 10%). The overall weight of the Need block is set at 35%, following the "higher-score" principle: a mahalla with a larger problem is assessed as having a greater intervention potential.

The Economic Potential block (EP) comprises four indicators: enterprise density (EP1, weight 15%), the employment rate (EP2, weight 10%), trade activity (EP3, weight 8%) and the soil-fertility (bonitet) score (EP4, weight 7%), totalling 40%. This block measures the extent to which the mahalla possesses the real economic base needed to address existing need.

The Social Infrastructure block (SI) comprises three indicators: pre-school enrolment coverage (SI1, weight 10%), the school-provision rate (SI2, weight 8%) and the density of healthcare facilities (SI3, weight 7%), totalling 25%. This block reflects the institutional environment required for investment in human capital.

Stage 3. Calculating the block and final indices

$$N_j = 0.15 \cdot x_{N1,j}^{*} + 0.10 \cdot x_{N2,j}^{*} + 0.10 \cdot x_{N3,j}^{*} \quad (2)$$

$$EP_j = 0.15 \cdot x_{EP1,j}^{*} + 0.10 \cdot x_{EP2,j}^{*} + 0.08 \cdot x_{EP3,j}^{*} + 0.07 \cdot x_{EP4,j}^{*} \qquad (3)$$

$$SI_j = 0.10 \cdot x_{SI1,j}^{*} + 0.08 \cdot x_{SI2,j}^{*} + 0.07 \cdot x_{SI3,j}^{*} \quad (4)$$

$$PRPI_j^{total} = N_j + EP_j + SI_j \quad (5)$$

$$PRPI_j^{norm} = \left[\frac{PRPI_j^{total} - min_j(PRPI^{total})}{max_j(PRPI^{total}) - min_j(PRPI^{total})}\right] \times 10 \qquad (6)$$

The final PRPI value is re-normalized on the (0;10) scale, which allows results obtained in different periods and different territories to be compared. In generalized form, the index can be written as:

$$PRPI_j = \frac{\left\{\Sigma_{i=1}^{10}\left[w_i \cdot x_{i,j}^{*}\right] - PRPI_{min}^{total}\right\}}{\left\{PRPI_{max}^{total} - PRPI_{min}^{total}\right\}} \times 10 \quad (7)$$

where *j* is the mahalla (*j* = 1, 2, …, 516); *i* is the indicator; wi is the weight of indicator *i*; xi,j is the raw value of indicator *i* for mahalla *j*; and x*i,j is its normalized value.

Evaluation scale

Based on the resulting PRPI values, mahallas are classified into four groups (Table 1). The classification thresholds follow the principle of equal absolute intervals (rather than quartiles), which ensures the comparability of results across years and territories.

Table 1. Evaluation scale of the PRPI methodology.

Scale (points)	Group	Description
(7;10]	High potential	Strong need + good resources - immediate, rapid intervention
(5;7]	Medium potential	Potential exists - support is needed
(3;5]	Low potential	Resources are limited - a systemic approach is needed
(0;3]	Very low potential	Resources are very scarce - comprehensive reform is needed

3. Results

The methodology was tested on the 516 mahallas of 13 districts and cities of the Bukhara region. The regional average PRPI value was 3.03 points, close to the lower bound of the "low potential" band, indicating that the economic and infrastructural foundation required for poverty reduction has not yet been sufficiently formed in the majority of the region's mahallas.

Table 2. Distribution of mahallas by PRPI across the districts of the Bukhara region.

District	Mahallas	Avg. PRPI	Min–Max	High	Medium	Low	Very low
Bukhara city	63	2.60	1.21–5.89	0	1	36	26
Kogon city	19	3.28	1.37–5.00	0	1	10	8
Bukhara district	36	2.64	1.52–4.94	0	0	7	29
G'ijduvon	74	3.93	1.84–10.00	2	11	46	15
Jondor	50	3.12	1.63–6.71	0	3	16	31
Kogon district	22	3.31	1.81–6.80	0	1	13	8
Olot	34	3.00	1.93–4.99	0	0	12	22
Peshku	36	3.09	1.40–7.74	1	0	17	18
Qorako'l	49	3.59	1.83–9.26	2	6	19	22
Qorovulbozor	7	2.57	1.58–3.41	0	0	2	5
Romitan	42	2.97	1.07–6.37	0	2	18	22
Shofirkon	49	3.23	1.29–5.52	0	2	25	22
Vobkent	35	3.03	1.78–4.39	0	0	16	19

The district-level results reveal substantial inter-territorial disparity. G'ijduvon and Qorako'l districts show relatively high average scores and the largest numbers of high-potential mahallas (2 each), standing out as the most favourable areas region-wide. By

contrast, Bukhara district and Qorovulbozor district have the lowest average scores, with not a single high- or medium-potential mahalla recorded in either district - all of their mahallas fall into the low and very-low groups only.

The final regional classification (Table 3) shows that, of the 516 mahallas, only 5 fall into the high-potential group and 27 into the medium-potential group, together accounting for just 6.2% of all mahallas. The remaining 93.8% - 237 mahallas and 247 mahallas - fall into the low- and very-low-potential groups, respectively. This distribution provides clear empirical confirmation of the inefficiency of a uniform (universal) resource-allocation policy: if state programs are implemented with a one-size-fits-all approach that disregards inter-mahalla differences, a large share of resources risks being spread across mahallas that possess neither sufficient need nor sufficient intervention potential.

Table 3. Classification of mahallas by PRPI score and core strategy direction.

PRPI score	Group	Mahallas (share)	Core strategy
7–10	I. High potential	5 (0.97%)	Rapid-growth strategy - development as an economic catalyst and a pilot-project hub
5–7	II. Medium potential	27 (5.23%)	Growth-support strategy - systemic assistance to fully realize existing potential
3–5	III. Low potential	237 (45.93%)	Infrastructure-restoration strategy - building the basic economic and social foundation
0–3	IV. Very low potential	247 (47.87%)	Systemic-reform strategy - comprehensive social protection and structural change

The five mahallas of Group I - Todon (PRPI = 10.00) and Baraka (7.97) in G'ijduvon district, Tashabbus (9.26) and Paykent (9.19) in Qorako'l district, and Obidxo'ja (7.74) in Peshku district - combine high need with strong economic and infrastructural potential and are therefore the mahallas most likely to yield rapid results. At the opposite extreme, the lowest-scoring mahalla of Group IV - Bog'iturkon in Romitan district (PRPI = 1.07) - records very low values across all three blocks and requires separate, complex, long-term planning.

Based on the classification results, a phased (short-term: 0–1 year; medium-term: 1–3 years; long-term: 3–7 years) differentiated mechanism was developed for each group, with clearly assigned responsible institutions and priority instruments (Table 4).

Table 4. Structural elements of the differentiated mechanism across groups.

Parameter	Groups I–II (5+27)	Group III (237)	Group IV (247)
Priority instrument	Business incubator, grant programs, vocational training, digital platform	Micro-industrial zone, rural cooperatives, infrastructure mapping	Family passport system, three-tier social assistance, employment support
Responsible institution	District administration; Ministry of Economy and Finance; Ministry of Employment and Labour Relations	District administration; Ministry of Economy and Finance	Mahalla Fund; Bukhara Regional Department for Poverty Reduction and Employment

Parameter	Groups I–II (5+27)	Group III (237)	Group IV (247)
Strategic goal (7 years)	Scale-up as a regional pilot model	Transition to Group II	Transition to Group III

A distinctive feature of the mechanism is its dynamic (non-static) nature: no mahalla remains permanently locked into a single group. As the PRPI is recalculated annually, a mahalla whose indicators improve moves to a higher group and correspondingly gains access to a new, broader set of instruments. This dynamic group-transition system serves not only a monitoring function but also acts as an additional incentive mechanism for local authorities and residents.

4. Discussion

The results obtained are consistent with a number of international studies. In particular, the "dual cutoff" principle established by S. Alkire and J. Foster - the idea of prioritizing units that simultaneously show low values across several dimensions - was applied in the PRPI methodology after being adapted to the territorial (mahalla) level. The key difference is that the classical Alkire–Foster methodology is based on "counting" deprivations at the individual or household level, whereas the PRPI functions as a targeting index that accounts for need and resources simultaneously at the level of a territorial unit, which brings it closer to the geographic-targeting literature - including the ELL approach proposed by C. Elbers and colleagues. Unlike the ELL method, however, the PRPI does not require complex econometric modelling or dedicated surveys: it relies on existing administrative (passport and household-registry) data, which makes it a considerably cheaper and faster tool to apply in practice, particularly in developing countries such as Uzbekistan.

The practical significance of the results lies in the fact that 93.8% of mahallas fall into the low- or very-low-potential groups - an indicator that does not simply mean "poverty is high," but rather that in the majority of mahallas the economic-infrastructural foundation required for poverty reduction has not yet been sufficiently formed. This is broadly consistent with the author's earlier diagnostic study of the current state and structural characteristics of poverty across the Bukhara region, which likewise identified pronounced inter-district disparities in the socio-economic preconditions for poverty reduction. This, in turn, is a practical confirmation of the aggregation problem highlighted by F. Bourguignon and S. Chakravarty: if policy is shaped on the basis of need alone (e.g., the official poverty rate), direct cash transfers to low-potential mahallas may not by themselves produce a sustainable outcome - infrastructure and an economic foundation must first be built, which is precisely why the infrastructure-restoration strategy was designated as the priority for Group III.

The study has several limitations. First, the PRPI was computed from static (single-year cross-sectional) indicators; tracking mahalla dynamics over time in a panel format is a promising direction for future research. Second, an expert-analytical method was used to set the weights; comparing this against objective statistical weighting methods such as principal component analysis (PCA) or the entropy method could further strengthen the reliability of the methodology. Third, the methodology was tested under the conditions of the Bukhara region specifically, and the quality and completeness of the local database will remain a decisive factor when applying it to other regions. Nonetheless, the structure of the methodology (three blocks, ten indicators, a dynamic group-transition system) is inherently replicable and can also be applied in other regions of Uzbekistan.

5. Conclusion

The study developed an original PRPI methodology that quantitatively assesses the poverty-reduction potential of the mahallas of the Bukhara region, and validated it using data from 516 mahallas. The methodology aggregates ten indicators across three blocks (Need - 35%, Economic Potential - 40%, Social Infrastructure - 25%) onto a (0;10) scale through min–max normalization.

The validation results show that only 6.2% (32) of the region's mahallas fall into the high- or medium-potential groups, while the remaining 93.8% (484) fall into the low- or very-low-potential groups. This finding provides empirical confirmation of the practical inefficiency of a uniform (universal) resource-allocation policy and substantiates the need for a differentiated, targeted approach.

The scientific novelty of the study consists of: (1) the development of an original, administrative-data-based composite targeting index applicable at the mahalla level; (2) the formulation, on the basis of the classification results, of a phased (short-, medium- and long-term) differentiated mechanism with clearly assigned responsible institutions and instruments for four groups of mahallas; and (3) the incorporation into the mechanism of a dynamic group-transition system that performs not only a diagnostic but also an incentivizing function.

As a practical recommendation, it is proposed that the PRPI methodology be formally incorporated into the process by which regional and district administrations design their annual social programs, in particular at the stage of allocating resources among mahallas. Future research should extend the PRPI to a panel (multi-year) format, benchmark the weighting method against objective statistical techniques, and test the methodology in other regions of Uzbekistan.

REFERENCES

[1] President of the Republic of Uzbekistan, "On the State Program 'From Poverty to Prosperity,'" Decree No. PP-330, Sep. 23, 2024.

[2] S. Alkire and J. Foster, "Counting and multidimensional poverty measurement," *Journal of Public Economics*, vol. 95, nos. 7–8, pp. 476–487, 2011.

[3] S. Alkire and J. Foster, "Understandings and misunderstandings of multidimensional poverty measurement," *The Journal of Economic Inequality*, vol. 9, no. 2, pp. 289–314, 2011.

[4] J. Foster, J. Greer, and E. Thorbecke, "A class of decomposable poverty measures," *Econometrica*, vol. 52, no. 3, pp. 761–766, 1984.

[5] A. B. Atkinson, "Multidimensional deprivation: Contrasting social welfare and counting approaches," *The Journal of Economic Inequality*, vol. 1, no. 1, pp. 51–65, 2003.

[6] F. Bourguignon and S. R. Chakravarty, "The measurement of multidimensional poverty," *The Journal of Economic Inequality*, vol. 1, no. 1, pp. 25–49, 2003.

[7] S. Alkire, J. Foster, S. Seth, M. E. Santos, J. M. Roche, and P. Ballon, *Multidimensional Poverty Measurement and Analysis*. Oxford, U.K.: Oxford University Press, 2015, 464 p.

[8] C. Elbers, J. O. Lanjouw, and P. Lanjouw, "Micro-level estimation of poverty and inequality," *Econometrica*, vol. 71, no. 1, pp. 355–364, 2003.

[9] Ministry of Poverty Reduction and Employment of the Republic of Uzbekistan, "Official reference," no. 01/00-03/26-10951, Oct. 30, 2024.

[10] B. N. Navruz-Zoda, "The mono-economic path of poverty reduction," *Iqtisodiyot va Turizm*, no. 1(1), pp. 20–34, 2021.

[11] Sh. N. Xayitov, "Improving the methodology for increasing employment and welfare on the basis of poverty reduction," D.Sc. dissertation abstract in Economics, Bukhara, Uzbekistan, 2025, 70 p.

[12] Sh. N. Musulmonova, "Socio-economic and theoretical-conceptual foundations of the phenomenon of poverty," *Yashil Iqtisodiyot va Taraqqiyot*, no. 4, pp. 75–80, 2026.

[13] Sh. N. Musulmonova and A. B. Nizamov, "Current state, dynamics and structural characteristics of poverty in the Bukhara region," *American Journal of Economics and Business Management*, vol. 9, no. 5, pp. 457–465, 2026.
[14] Sh. N. Musulmonova, "Analysis of existing opportunities for poverty reduction and employment promotion across the districts of the Bukhara region," *Yashil Iqtisodiyot va Taraqqiyot*, Special Issue, pp. 223–228, Bukhara, Uzbekistan, 2024.
[15] Sh. N. Musulmonova, A. B. Nizamov, and M. B. Izzatullayeva, "Quality of life and socio-economic status of households in the Bukhara region: An analysis of survey results," *Muhandislik va Iqtisodiyot*, no. 4(2), pp. 192–198, 2026.
[16] Q. Abdurakhmanov, "From raw-material dependence to global integration," *Khalq So'zi*, no. 182/9353, Sep. 2, 2026.