ANALYZING THE RURAL POVERTY IN THE REPUBLIC OF NORTH MACEDONIA ACROSS DIVERSE INCOME COMPOSITIONS

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ABSTRACT

The available evidence indicates that a majority of the world's impoverished population resides in rural areas, where agriculture and natural resource management are crucial for their livelihoods and food security. In North Macedonia, rural areas house a significant proportion of the population, accounting for 57.5%. However, these regions face high levels of poverty due to limited access to resources, essential services, technologies, markets, and economic opportunities. The study analyzes multiple income scenarios of monetary rural poverty in order to explore the impact of social transfers and subsidies on poverty rates and income inequality in two North Macedonian regions, Pelagonia and Polog. In order to measure rural poverty, a poverty threshold is employed, which is set at 60% of the median equivalent income. Additionally, widely recognized metrics like the Lorenz curve and Gini coefficient are utilized to assess income inequality. Data was collected through field interviews of 140 rural households in 2018 from Pelagonia and Polog statistical regions. The findings highlight a significant reduction in the poverty rate and a more equal distribution of income when social transfers and subsidies are considered. At the overall sample level, poverty decreases from 32% to 17% when transfers are factored in, and the Gini coefficient exhibits a decline from 0.48 to 0.29. To effectively reduce poverty, improve livelihoods, and foster sustainable development in rural areas of Macedonia, it is crucial for policymakers and stakeholders to prioritize key recommendations such as enhancing resource management, long-term investments, technological advancements in agriculture and promoting income diversification.

Keywords: *Poverty threshold, Gini coefficient, Lorenz curve, Rural well-being.*

INTRODUCTION

Rural poverty is a significant global issue, affecting a large portion of the world's population. The 2030 Agenda for Sustainable Development and national development agendas prioritize ending poverty and hunger. Evidence shows that

rural areas are home to the majority of the world's poor, and agriculture plays a vital role in their livelihoods and food security (FAO, 2022). Over 800 million people, representing approximately 75% of the world's poor, live in rural areas. Current trends suggest that the global poverty rate will not drop below 50% before 2035 (Lipton & Ravallion, 1995). Rural poverty is characterized by deprivation, vulnerability, and powerlessness, which hinder the well-being of individuals (Lipton & Ravallion, 1995). It can be either chronic or transient, with acute transient poverty potentially perpetuating across generations. Various economic, social, and external factors contribute to rural poverty, with a key factor being the lack of integration of rural areas into the broader socioeconomic and political system of national economies (Kosev, 2015). Traditionally, poverty has been associated with a lack of income and assets. However, contemporary perspectives emphasize that poverty goes beyond economic indicators and includes the absence of essential opportunities for a decent life, such as access to education, healthcare, and social inclusion (Bogdanov, 2015)

Based on official data from the State Statistical Office of North Macedonia (MakStat database, 2022), the at-risk-of-poverty rate after social transfers varied between 21.5% in 2015 and 26.8% in 2011. The at-risk-of-poverty rate before social transfers (except pensions) decreased from 30.4% in 2011 to 25.7% in 2020, with an average of 26.4%. In contrast, the at-risk-of-poverty rate after social transfers in the European Union (EU) was consistently lower than in North Macedonia during the same period. The rate ranged from 16.7% in 2020 to 17.5% in 2016 (Eurostat, 2023).

Official statistical data provide information for the entire population, but specific data on poverty rates in rural areas are not available. Therefore, the primary objective of this paper is to examine rural poverty rates and income inequality in the Macedonian regions of Polog and Pelagonia. This will be achieved by analyzing multiple income scenarios, taking into account both, the presence and absence of social transfers and subsidies. By considering these various scenarios, a comprehensive understanding of the dynamics of rural poverty and income inequality can be attained.

MATERIAL AND METHODS

The research sample comprises 140 rural households from two distinct regions, Pelagonia and Polog, characterized by their unique demographic, ethnic, natural, cultural, and economic features. The data collection took place in 2018 through direct meetings with rural households. A specially designed questionnaire was utilized, with the aim of comprehensively exploring and determining the socio-economic characteristics of the participants. To measure the poverty of the households in the sample, the most widespread method based on income was used, by comparing the income of the household with the poverty threshold, which is equivalent to 60 percent of the median national equivalent income of the persons living in the household (SSO, 2018). To facilitate comparisons between households with varying sizes and demographic compositions, equivalence scales were

employed as a deflator to account for these differences. The equivalence scale utilized in this analysis aligns with the one adopted by the State Statistical Office, based on the OECD equivalent scale with weights of 1.0 for the first adult, 0.5 for any other household member aged 14 or over and 0.3 for each child below age 14. The poverty threshold for each household is calculated by multiplying the sum of the assigned weights for each member of the household with the annual equivalent income (SSO, 2018). According to this methodology, households with incomes falling below the calculated poverty line are classified as poor.

Recognizing the significance of income distribution in evaluating the role of transfers in maintaining social coherence, the analysis incorporates a comprehensive calculation of income distribution within the aforementioned scenarios. The Lorenz curve and Gini coefficient are commonly used measures to assess income inequality. The Lorenz curve is a graphical representation of income distribution within a population. It visually depicts the cumulative percentage of total income received by the corresponding cumulative percentage of the population. The farther the Lorenz curve deviates from the diagonal line (representing perfect equality), the greater the level of inequality depicted (Lorenz, 1905). The Gini coefficient is defined as the relationship of cumulative shares of the population arranged according to the level of equivalised disposable income, to the cumulative share of the equivalised total disposable income received by them (SSO, 2018). The coefficient varies between 0 and 1, with 0 representing perfect equality and 1 perfect inequality (Lorenz, 1905). This coefficient is derived from the Lorenz curve and represents the area between the real inequality curve and the absolute equality curve of the income distribution of the population under study (Cowell, 1977). In this research, the Gini coefficient was calculated using Jenkins' formula (Jenkins, 1999):

$$G = 1 + \frac{1}{N} - \left(\frac{2}{m * N^2}\right) * \sum_{i=1}^{N} (N - i + 1) * Yi$$

G – Gini-coefficient
N – Sample size
Yi – Total household income i
m – Arithmetic mean

In the analysis, the income structure of rural households is classified into three main sources of income based on the methodology proposed by Davis and Pearce (2001): 1. On-farm income, 2. Off-farm income, and 3. Non-earned income (transfers). On-farm income encompasses both agricultural core activities and non-agricultural activities carried out within the rural households, as well as income generated from the household's resources such as forestry, processed agricultural products, rural economic activities and other sources like land and machinery rental. Off-farm income refers to earnings derived from sources outside the household's resources, including seasonal work and employment opportunities available outside the household. Non-earned income includes sources such as remittances, pensions, and various forms of financial support from state

institutions, including social payments, agricultural subsidies and social insurance. To assess the influence of income on rural households at various levels (including or excluding: on-fam fixed costs, agricultural subsidies, other transfers), five scenarios were developed to calculate the poverty threshold: *Scenario 1*: Households below the poverty line with disposable income included: on-farm income (based on variable costs) + off-farm net income + all transfers; *Scenario 2*: Households below the poverty line with disposable income included: on-farm income (based on variable costs) + off-farm net income + transfers (excluding agricultural subsidies); *Scenario 3*: Households below the poverty line with disposable income included: on-farm net income (based on total costs) + off-farm net income + transfers (excluding agricultural subsidies); *Scenario 4*: Households below the poverty line with disposable income included: on-farm income (based on variable costs) + off-farm net income - all transfers; *Scenario 5*: Households below the poverty line with disposable income included: on-farm net income (based on total costs) + off-farm net income - all transfers.

RESULTS AND DISCUSSIONS

The data obtained for rural income values from different sources show that households have an average annual total income of 11,531 EUR/household (Table 1). The highest income source is from primary agricultural production (4,231 EUR/household on average or 37%), followed by transfers (4,083 EUR/household on average or 35%), which include mostly agricultural subsidies, but also pensions, social transfers and other forms of assistance.

Table 1. Rural income values from different sources at the whole sample level

Income sources	Minimum (EUR/hous.)	Maximum (EUR/hous.)	Mean (EUR/hous.)	Share (%)	Standard deviation (EUR/hous.)	Coefficient of variation (%)
Income from on-farm agricultural activities	-	25,106	4,231	36.7	4,861	115
Income from on-farm non-agricultural activities	-	16,164	1,912	16.6	2,762	144
Off-farm income	-	10,894	1,305	11.3	2,031	156
Transfers	-	13,034	4,083	35.4	2,940	72
Total	2,439	37,805	11,531	100.0	6,515	56

The net income from non-agricultural activities realized by the household is in third place in significance accounting for 1,912 EUR/household on average, with a share of 17%, but with a high coefficient of variation of 144%. Off-fam incomes from wages and seasonal labour that are realized outside the farm have the lowest values, 1,305 EUR/household, and have a share of 11%.

The main findings regarding the poverty line across different scenarios are provided in Table 2. In the *First Scenario*, which includes on-fam income at the level of variable costs and all transfers (including pensions, assistance, social

transfers, and subsidies), the poverty rate is the lowest in the sample. Only 3 households from the Polog region are below the poverty line, resulting in an overall poverty rate of 2% for the entire sample. In the *Second Scenario*, income categories remain the same as in the first scenario, with the exclusion of agricultural subsidies from the transfers. As a result, the poverty rate for the entire sample increases to 7%, indicating that subsidies have an impact on reducing the poverty rate. In the Pelagonia region, 6% of rural households (4 households) are below the poverty line, while in the Polog region, it is 9% (6 households). The *Third Scenario* takes into account on-farm net income (considering variable and fixed on-fam costs) and excludes subsidies from the transfers. The poverty rate for the whole sample in this scenario is 17%, with 14 households in the Pelagonia region (20%) and 10 households in the Polog region (14%) below the poverty line. In the *Fourth Scenario*, which includes on-farm income at the level of variable costs and excludes all transfers, the poverty rate increases to 21% for the whole sample. In Pelagonia, this indicator is 17% (12 households), while in Polog, it is higher at 24% (17 households). The *Fifth Scenario*, which excludes all transfers and includes on-farm net income, represents the most realistic picture of the economic success of rural households in terms of poverty. The poverty rate for the entire sample in this scenario is 32%, with 45 rural households below the poverty line. This high poverty rate indicates the significant dependence of rural households on social transfers, particularly state financial support in agriculture. The poverty rates in the Pelagonia and Polog regions are 33% (23 households) and 31% (22 households), respectively.

Table 2. Poverty rate and Gini coefficient of rural households in Pelagonia and Polog regions according to different scenarios.

Region	Pelagonia region			Polog region			Total		
Indicator	No. of Househ.	Poverty rate	Gini coef.	No. of Househ.	Poverty rate	Gini coef.	No. of Househ.	Poverty rate	Gini coef.
Scenarios	70			70			140		
Scenario 1	0	0%	0.24	3	4%	0.33	3	2%	0.29
Scenario 2	4	6%	0.25	6	9%	0.31	10	7%	0.30
Scenario 3	14	20%	0.34	10	14%	0.33	24	17%	0.44
Scenario 4	12	17%	0.29	17	24%	0.37	29	21%	0.44
Scenario 5	23	33%	0.41	22	31%	0.41	45	32%	0.48

Based on the results obtained from the calculation of the Gini coefficient, the *First Scenario*, which includes on-farm income at the level of variable costs and all transfers, exhibits the evenest income distribution with the lowest Gini coefficient value. On the other hand, the last *Fifth Scenario*, which excludes all transfers and includes on-farm net income, shows the highest level of income inequality,

reflected by a Gini coefficient value of 0.48 for households (Table 2). In Pelagonia, the Gini coefficient ranges from 0.24 in Scenario 1 to 0.41 in Scenario 5. For Polog, the values range from 0.33 in Scenario 1 to 0.41 in Scenario 5. These results suggest variations in income inequality between the two regions, with Pelagonia generally exhibiting lower inequality levels compared to Polog. The Lorenz curves depicted in Figures 1-6 visually support the findings from the Gini coefficient table. Notably, the area between the Lorenz curve and the diagonal is the smallest in the first scenario and largest in the last scenario, both in the total and in the regions (Figures 1-6). This indicates that the scenario incorporating all incomes, including transfers, exhibits the evenest distribution of income, emphasizing the significant impact of this income source on social cohesion within the surveyed rural population. These insights can be instrumental in designing targeted interventions that aim to promote social harmony, alleviate disparities among rural households, and reduce their dependency on social transfers and subsidies.
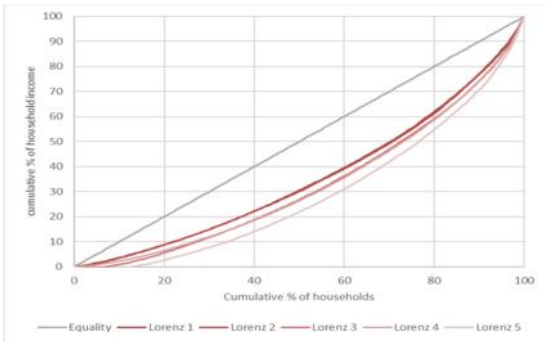

Figure 1. Lorenz curve of income inequality under different scenarios in the sample.
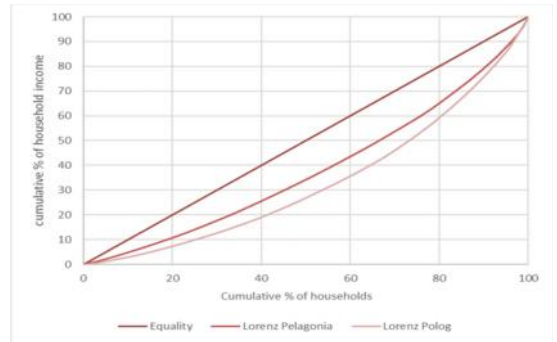

Figure 2. Lorenz curve for incomes by region under Scenario 1 of sample households.
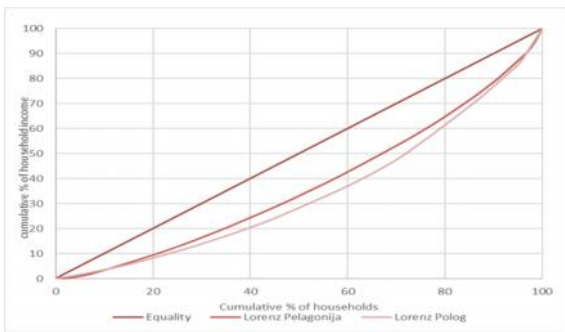

Figure 3. Lorenz curve for incomes by region under Scenario 2 of sample households.
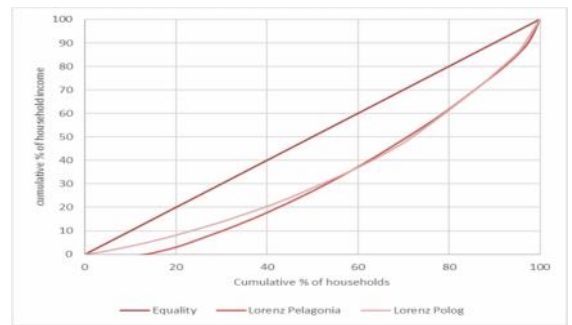

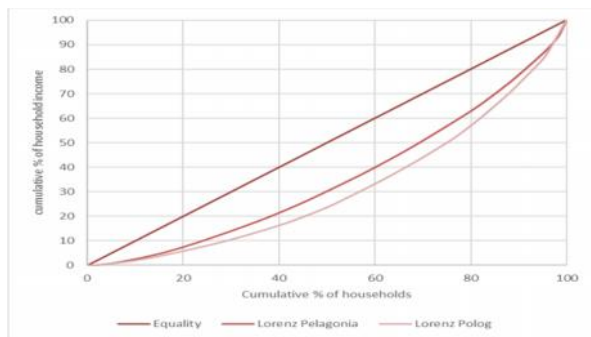Figure 4. Lorenz curve for incomes by region under Scenario 3 of sample households.

Figure 5. Lorenz curve for incomes by region under Scenario 4 of sample households.
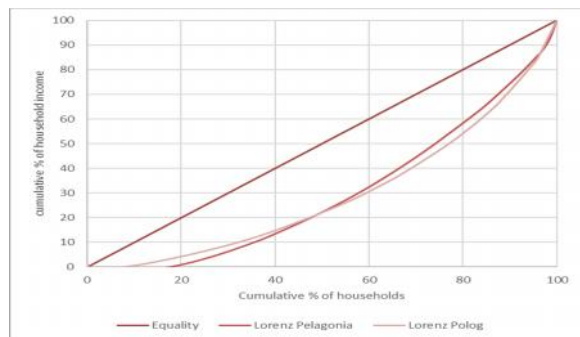

Figure 6. Lorenz curve for incomes by region under Scenario 5 of sample households.

CONCLUSIONS

The survey outcomes underscore the diverse levels of rural poverty rates and income inequality observed across different scenarios in Macedonian regions, Pelagonia and Polog. It becomes apparent that the welfare of rural households heavily relies on non-earned income sources, particularly agricultural subsidies, as a significant contributor to poverty alleviation. It also reveals regional disparities in poverty rates and income inequality between the Pelagonia and Polog regions. The persistent prevalence of rural poverty significantly drives the mass migration of people to urban areas. This concerning phenomenon is primarily attributed to the implementation of distorted government policies that unfairly penalize the agriculture sector and neglect the vital improvement of rural social and physical infrastructure. Consequently, these policies contribute to both urban and rural poverty within the country. While some inequality is inevitable in a market-based economic system as a result of differences in talent, effort, and luck, excessive inequality could erode social cohesion, lead to political polarization, and ultimately lower economic growth (Berg & Ostry, 2011). To address these challenges, Macedonian rural development policies should prioritize macroeconomic stability, competitive markets, public investments in physical and social infrastructure, long-term business investments, technological advancements in agriculture, support for small family businesses, promotion of rural diversification activities and strengthening informal education. By reducing dependence on social transfers and direct financial aid, these policies can promote entrepreneurial opportunities for the rural population, with a focus on empowering young people and women.

REFERENCES

Berg, A. G., Ostry, J. D. (2011) Inequality and Unsustainable Growth: Two Sides of the Same Coin? IMF, International Monetary Fund, Research Department, Washington, D.C., US.

Bogdanov, N. (2015) Ruralni razvoj i ruralna politika (Rural development and rural policy). Poljoprivredni fakultet, Beograd (Faculty of Agriculture, Belgrade).

Cowell, F. A. (1977) Measuring Inequality. Philip Allan, Oxford, UK.

Eurostat (2023) At-risk-of-poverty rate https://ec.europa.eu/eurostat/databrowser/view/tessi190/ Access on 08/7/2023.

FAO (2022) Measuring rural poverty with a multidimensional approach: The Rural Multidimensional Poverty Index. FAO Statistical Development Series, No. 19, Rome, FAO.

Davis, J., Pearce, D. (2001) The Non-Agricultural Rural Sector in Central and Eastern Europe. Report, 2630, Natural Resources Institute, UK.

Jenkins, S. P. (1999) Analysis of income distribution. In, Stata Technical Bulletin 48: 4-18, Texas, Stata Corporation.

Kosev, S. (2015) Agrarian policy. University "St. Cyril and Methodius" in Skopje, Faculty of Economics – Skopje, Republic of Macedonia.

Lipton, M., Ravallion, M. (1995) Poverty and Policy. In, Handbook of Development Economics, ed. By Jere Behrman and T. N. Srinivasan. Vol. 3B, Amsterdam: Elsevier.

Lorenz, M. O. (1905) Methods of Measuring the Concentration of Wealth. Journal of the American Statistical Association, 70, 209-217.

MakStat database (2022) General Laeken Poverty Indicators. State Statistics Office, Republic of Macedonia. Skopje, https://makstat.stat.gov.mk/PXWeb/pxweb/en/MakStat/MakStat Accessed on 07/07/2022.

SSO (2018) Survey of Income and Living Conditions, 2017. State Statistics Office, Republic of Macedonia, Skopje.