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HOUSEHOLD INCOME IN CAMBODIA: GINI ANALYSIS

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Abstract

This study examined how income is distributed among rural households and the different sources that contribute to it, as well as their role in addressing income inequality. It used the Gini coefficient to assess the impact of rural household income and other sources of income on income equality in 16 villages in Chub commune, Tboung Khmum district, Tboung Khmum province, Cambodia. It was found that income from farm activities accounts for 68.78% of total income, and the income distribution is slightly unequal based on the Gini index and Lorenz curve (0.166614239; 0.169607843; 0.022865854). This suggests that diversification of income sources has influenced equality, highlighting the importance of households being able to diversify their income sources to achieve wealth equality. Access to resources such as inputs and finance could help improve income equality among rural families. The study highlights the need for policymakers to focus on the provision of productive resources and access to financial resources such as loans, as these can generate significant living income and potentially help prevent inequality in rural communities. Furthermore, the study revealed that non-farm and other activities contributed to the variation in income equality, accounting for 31.22% of the total income of rural households. The Gini index for non-farming income was 0.082741477; 0.176054916 compared to farming income, indicating slight inequality in household income.

Keywords: Gini Coefficient, Inequality, Lorenz Curve, Household Income, Cambodia

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INTRODUCTION

The discussion of poverty has been a compelling topic. During the post-COVID-19 period from 2020 to 2023, Cambodia initiated development in various sectors including agriculture, industry, infrastructure, and tourism. Despite experiencing economic growth, the average monthly household income decreased by 1.8% to $385 in the first quarter of 2023 from $392 in the fourth quarter of 2022 and by 1.3% compared to $390 in the same period of the previous year. This was revealed in a survey report by Sothear (2023), which also indicated a reduction in the total average household basket size despite consumer optimism about their financial situation. Nonetheless, Cambodia's economy sustained strong growth in 2023 despite a decline in global demand, and is anticipated to further improve in 2024. The forecast for 2024 suggests a growth rate of approximately 6.6%, which is expected to elevate the GDP to 35.16 billion U.S. dollars (Pornmoniroth, 2024). In specific terms, Cambodia's GDP per capita for 2022 was $1,787, signifying a 9.93% increase from 2021. The country's GDP per capita is estimated to reach $1,917 in 2023 and is projected to rise to $2,071 in 2024. Cambodia's economy relies heavily on exports of garments, footwear, and travel goods, as well as on construction, real estate, tourism, and agriculture (Huaxia, 2023).

The link between economic growth and inequality is widely acknowledged. Kuznets (1955) introduced the concept of an inverted U-shaped curve to illustrate two phases of economic development. In the initial phase, inequality rises as the poor transition from agriculture to the industrial sector. In the later phase, as a majority of the population relocates to urban areas, the relative wages of lower-income workers increase, potentially leading to a reduction in overall income inequality. Recent research indicates that inequality has decreased in recent decades, but it is anticipated to rise again after 2027 due to factors such as population growth, economic expansion, and changes in the age distribution of the labor force (Nhem et al. 2018). From 2009 to 2019, Cambodia underwent a decade of consistent economic growth and widespread increases in income. The rapid expansion of the economy, coupled with restructuring efforts, resulted in higher wages and improved living standards. However, since 2020, the poverty rate has increased by 2.8 percent, leading to approximately 460,000 people falling below the poverty line (WB, 2022). Consequently, researchers and policymakers have increasingly turned their attention to examining household income, recognizing it as a critical factor in addressing rural poverty and inequality. For example, Jiao et al. (2015) conducted a study on rural income and

livelihoods in Cambodia, highlighting the need to include detailed environmental income accounting in future standard household economic surveys.

This paper delves into the intricate analysis of household income distribution in Chub Commune, Tboung Khmum District, Tboung Khmum Province, Cambodia, aiming to assess its impact on income inequality within the area. By employing the Gini coefficient, the study seeks to gain a comprehensive understanding of the various sources of income and to measure the income levels of rural households. This detailed examination of household income distribution is essential for evaluating the economic progress and social well-being of Cambodia. The Gini coefficient, a widely utilized measure of income inequality, provides valuable insights into the extent of income disparity within the society. Ultimately, the study endeavors to unravel the nuances of household income distribution and its far-reaching implications for Cambodia's overall prosperity and social equity.

Literature Review

Rural Livelihoods, Household Incomes and Inequality

Livelihood refers to the methods individuals use to sustain their lives and meet their basic needs (Khatun & Roy, 2012). Diversified livelihoods involve participation in different activities and occupations within a community to ensure well-being. Livelihood diversification is the process through which individuals increase their income while reducing threats to the environment (Hussein and Nelson, 1999). In his research, Adams' research classified rural income into five sources: nonfarm, agricultural, livestock, rental, and transfer income (Adams, 1994); indicating the diversification of livelihoods, namely farm and non-farm activities (Asfaw, 2018). In Cambodia, few studies have been conducted using household surveys to investigate the key drivers of income diversification and its role in alleviating poverty.

Rural households are increasingly diversifying into non-farm income activities due to better agricultural potential, market access, proximity to urban centers, and better infrastructure (Losch et al., 2011). This diversification leads to increased agricultural production and employment opportunities (Escobal, 2001; Djurfeldt et al., 2008). The causes and consequences of diversification vary based on location, assets, income, opportunity, and social relations. Social factors such as gender, social positions, networks, and associations also play a role (Ellis, 1998). Rapid population growth and pressure on natural resources,

particularly land, have led to the rise of nonfarm activities (Lay et al., 2008; Ellis 2005). Thus, land-poor households are forced to diversify into nonfarm activities to ensure survival.

Technological advances and the expansion of educational attainment are other drivers of non-farm incomes, particularly from high-return salaried and skilled employment (Reardon, 1997). Inter-household heterogeneity in terms of constraints and incentives is key to livelihood diversification behavior in rural areas (Barrett et al., 2001). However, complete reliance on own agricultural production is rare, except among the wealthiest rural households. Non-farm income sources are most commonly used by households in agro-ecologies with low potential, such as higher risk and drier areas, due to low agricultural productivity (Rashidin et al., 2020). Incomplete markets for assets like land, labor, credit, or insurance cause diversification behavior (Barrett et al., 2001). Some farm households may also undertake local farm and non-farm investments by selling their labor in the migratory labor market and using the remittances to set up nonfarm businesses, buy farm capital, and invest in education (Reardon, 1997).

Factors affecting inequality in income distribution

Income inequality is a complex issue influenced by various factors such as economic development, demographics, political, cultural, environmental, and macroeconomic factors (Kaasa, 2005). According to Dabla-Norris et al. (2015) income inequality is determined by global trends, technological change, trade globalization, financial globalization, financial deepening, labor market changes, redistributive policies and education. These factors are interrelated and affect income distribution, job losses, wage gaps, access to capital and social equity, requiring effective policies.

Analyzing income inequality involves examining household income and individual income by age, group, source of income, occupational status, and household head's status in industry (Takayama, 1980). According to Lerman and Lerman (1989), income inequality is affected by the source of a person's income, capital gains and dividends are distributed more unequally than wages. This approach provides a general overview of income dynamics and helps understand the distribution of different types of income within households.

Non-farm income is a potential source of inequality reduction, with income from unskilled labor equalizing income distribution (Adams, 1994). Studies by Ahmad (2002) have shown

that skilled workers experience the greatest inequality, while unskilled workers have the lowest levels due to the more uniform wage system in the public sector. According to Glewwe (1986), labor income inequality accounts for over half of total inequality in urban sectors, but not in rural areas. Non-labor income is linked to the unequal distribution of land and capital in rural areas, while labor income inequality is explained by education. In rural areas, labor and crop income contribute most to agricultural income inequality, rather than land ownership imbalances (Alderman, 1992).

METHODS

Models and Research Approach

The conceptual framework for this study is adapted from the Sustainable livelihoods framework (SLF) (Ellis 1999; Chambers and Conway, 1991). The framework outlines activities as a means of living by an individual or a household to construct a livelihood. It demonstrates how livelihoods are achieved through various strategies to achieve certain livelihood outcomes as incomes (Alinovi et al., 2010). The decision to engage in farm or non-farm activities or both is influenced by individual or household factors, as well as social, economic, and environmental factors. It suggests that people diversify their livelihoods, mainly by exploiting opportunities between farm and nonfarm activities. Due to limited resources, the vast majority of small farmers have not yet benefited from increased incomes and prosperity based on livelihood diversification.

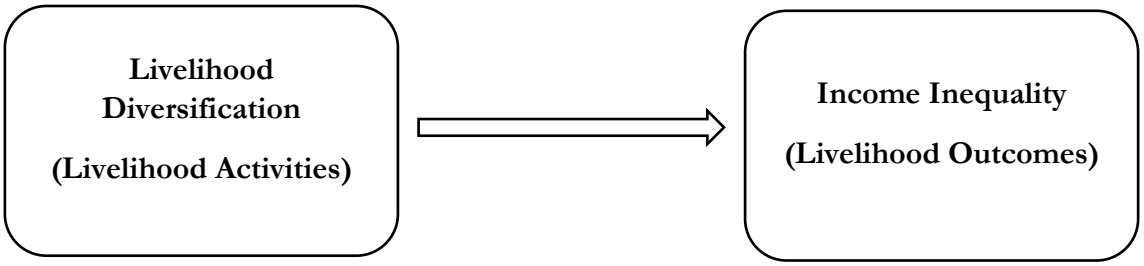


Figure 1: The Conceptual Framework for Rural Livelihood

Data Collection

This study examined 230 participants from 16 villages in Chub Commune, located in Tboung Khmum District, Tboung Khmum Province, Cambodia. Most of the respondents were engaged in rice cultivation. Many family members had migrated abroad, to Phnom

Penh or provincial cities for work, resulting in a reduction in the agricultural workforce in rural communities.

Data was collected through household interviews selected from 4,665 households of a total population of 20,386 people over a period of one week. The selection is a random sampling, which involves dividing the population into subgroups and then selecting samples from each subgroup to ensure different characteristics are represented. The survey used a structured questionnaire to collect information on household sources of income, covering activities such as rice cultivation, off-farm work, agricultural work (i.e. livestock farming, fishing, plantation work) , self-employment and other sources. (i.e. rents). Before the field study, the questionnaires were pre-tested among the respondents. Interviews were conducted with village leaders and local residents, with the aim of understanding the sources of income of families in these villages and their impact on income inequality.

Data Analysis

Gini Coefficient and Lorenz Curve

The Gini coefficient is widely used internationally to measure income inequality. It ranges from 0% to 100%, with 0% indicating equal income distribution among households and 100% indicating one household having all the income (Frank, 2010). A lower Gini coefficient signifies more equal household income distribution. In a study of 16 rural villages, the author used the Gini decomposition technique to analyze income sources and their impact on income inequality. This method assesses the influence of multiple income sources on income inequality. Through Gini decomposition, the author calculated income inequality and interpreted the results using the Lorenz Curve. A smaller Gini coefficient suggests greater income equality, while a larger coefficient indicates more unequal income distribution.

RESULTS AND DISCUSSION

The previously established framework is being used to analyze income distribution data in Chub commune, followed by an examination of the impact of income sources on inequality. The dataset consists of annual incomes from a sample of 230 households out of a total of 4,665 households. Household income is divided into three components: farming, non-farming, and other sources of income. Primary sources of household income include

rice cultivation, agricultural work, animal husbandry (livestock), and plantation activities, followed by off-farm work, self-employment, wages and salaries, rents, business income, and others (see Table 1).

Table 1. Average annual income from different sources

Income Source	Frequency	Minimum	Maximum	Mean	Std. Dev
Rice Farming	51	$250	> $500	$310	$245
Livestock	12	$250	> $500	$380	$249
Plantation	96	$250	$350	$266	$61
Non-farm	32	$250	> $500	$305	$165
Other	39	$250	> $500	$317	$277
Total	230	$250	> $500	$286	$211

Table 2 shows that the proportions of various income sources in household earnings differ significantly among different groups of households, arranged in ascending order of their incomes. The data reveals that plantation income contributes 35.62% to the total income of all sampled households, indicating a substantial reliance on plantation-based income for a significant number of households. Additionally, the contribution of rice farming to household income is noteworthy at 27%, further emphasizing the importance of agricultural activities in the community. Conversely, livestock makes the smallest contribution to household income at 6.16%, indicating a lower dependence on livestock-related income among the surveyed households. This detailed breakdown provides valuable insights into the income dynamics within the community, highlighting the varying degrees of reliance on different sources of income for livelihoods.

Table 2. Income source of respondents.

Income Source						
Group	**Frequency**	**Population (%)**	**Income (%)**	**Income/Population**	**Cumulative % Population**	**Cumulative % Income**
Livestock	12	5.2	$4,250 **(6.16%)**	1.182	5.2	6.16
Non-farm	32	13.9	$8,800 **(12.74 %)**	0.91	19.1	18.89
Other	39	17	$12,700 **(18.39 %)**	1.08	36.1	37.28

Rice farming	51	22.2	$18,700 **(27%)**	1.21621	58.3	64.28
Plantation	96	41.7	$24,600 **(35.62 %)**	0.85	100	100
Total	230	100	$69,050			

Table 3 displays the Gini coefficient values, indicating the impact of different income sources on inequality within the community. Among the income sources, 'livestock' and 'non-farming' contribute minimally to the total income, while 'plantation', 'rice farming', and 'other' sources make substantial contributions. The Gini ratio for 2023 confirms a relatively low level of income inequality in Chub commune, suggesting a more balanced distribution of household earnings. The income source index (ISI) variables in table 2 also reveal slight inequality, as indicated by the Gini ratios of 0.022865854, 0.082741477, 0.166614239, 0.169607843, and 0.176054916 for the respective income sources. In addition to the Gini coefficient values, it is important to consider the implications of the income sources on the overall well-being of the community. The minimal contribution of 'livestock' and 'non-farming' income sources suggests that these sectors may require further support and development to enhance their impact on household earnings. On the other hand, the substantial contributions from 'plantation', 'rice farming', and 'other' sources highlight the significance of these sectors in driving economic stability within the Chub commune. Moreover, the relatively low Gini ratio for 2023 indicates a more equitable distribution of income among households in the community. This balanced distribution of household earnings can have positive effects on various aspects of community life, including access to education, healthcare, and overall standard of living. Understanding these disparities can inform targeted interventions aimed at reducing inequality and promoting inclusive economic growth within the community.

Table 3. Gini Ratio in Income

Income Source	Income Source Gini
Rice Farming	0.166614239
Livestock	0.169607843
Plantation	0.022865854
Non-farm	0.082741477
Other	0.176054916

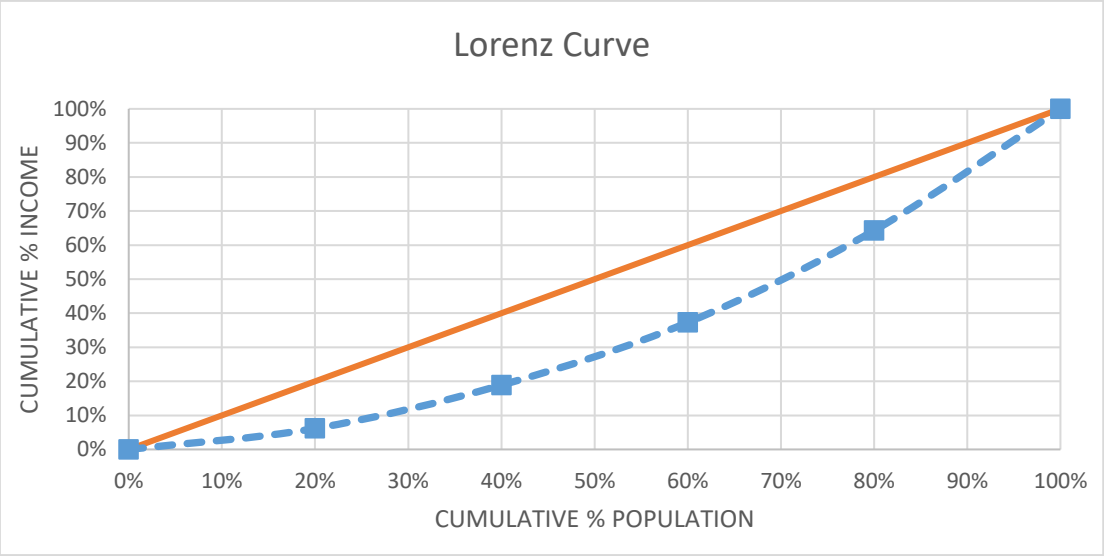


Figure 2. Lorenz Curves showing Annual Total Income

The whisker plot in Figure 1 illustrates the income disparities among different sources in the study. On average, households in the study earned $380 from 'livestock', $317 from other sources, and $266 from 'plantation'. This suggests that people can potentially earn more income from raising animals (animal husbandry). Additional evidence from provincial statistical data of Tboung Khmum province (2023) reveals that the annual income from livestock for the entire population is $32,674,299 more than the annual income from the other two sources. Specifically, the average household income from livestock in Tboung Khmum district is $975, while income from plantation is $934 and income from rice farming is $78.6. Furthermore, the analysis indicates that the median farm income of households, as represented by the box on the line, has numerous outliers and is generally higher than income from non-farm sources and others (refer to Figure 1).

In conclusion, the income inequality findings for Cambodia in the financial year ending 2023 provide valuable insights for policymakers. These insights can be instrumental in formulating targeted policy measures to improve the distribution of rural household incomes, ultimately contributing to a more equitable society.

CONCLUSION

From the results it can be concluded that agricultural income remains the main source of livelihood for rural families. Diversification alone is not enough to significantly influence income distribution. On the contrary, the ability of families to diversify their source of

income plays a crucial role in achieving wealth equality. It is clear that more capable families have more resources and assets, which allows them to diversify their sources of income and ultimately benefit from more income. On the other hand, less capable families have even fewer opportunities for diversification, contributing to the growing gap in the distribution of wealth at the local level. Attention should be placed on the need for targeted interventions aimed at addressing local inequalities and providing support to disadvantaged families. By focusing on these areas, we can work towards a more just and inclusive society. Furthermore, efforts should be made to promote high-yielding sectors and help families further diversify their sources of income. Overall, creating a more equitable society requires a comprehensive approach that addresses income diversification.

In line with government policies aimed at optimizing human development factors, particularly focusing on education, healthcare and economic access to ensure equity, policymakers should prioritize reducing the skills gap by equipping farmers with management skills and techniques for assessing the potential impact on income distribution due to changes in government policy, political events or other factors. Additionally, efforts should be made to improve employment opportunities and tourism infrastructure in rural areas. In this regard, education plays a crucial role, hence the government should work towards equalizing facilities, infrastructure and access to education. Infrastructure development in remote districts is also crucial to improve the diversification of income sources and ensure equal opportunities for all. Policymakers should consider non-farm activities when planning rural development, as income from non-farm and other activities can impact equality in rural communities. However, the distribution of income from different activities in the study area is slightly unequal.

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