

Household income diversification: A quantitative driver of regional inequality in Eswatini

¹Macedo, F., ²Ogunniyi, L. T., ³Fanifosi, G. E. and ¹Dlamini, D. D.

¹Department of Agricultural Economics and Management, University of Eswatini, Eswatini

²Department of Agricultural Economics, Ladoke Akintola University of Technology, Ogbomoso, Nigeria

³Department of Agricultural Economics and Extension, Ajayi Crowther University, Oyo, Nigeria

Correspondence details: ltogunniyi@lautech.edu.ng

Abstract: The study adopts both quantitative and qualitative survey approach to examine income diversification among rural households in Eswatini. Specifically, identify different income source for rural households of the respondents; estimate the income level of rural households in the study area and investigate the determinants of income diversification among rural households. Using the Eswatini Household Income and Expenditure Survey (EHIES) for 2016/2017, the study analyses the set objective through descriptive statistics, Herfindahl index, and Tobit regression model. The result showed that the average farm income from the respondents stood at E228.01, the estimated non-farm income stood at E2616.91, wage employment (E2858.13) while remittance have a record of E429.74 and social transfer (E113.49). Also, it was observed that most (97.57 percent) of the respondents had more than two sources of income. About 65.38 percent of the households in the study area diversified around the portfolio of income activities specified in the study, this was revealed by the estimated value of SEI. In addition, the coefficient of dependency ratio sex, household size, education, access to social grant, livestock holdings and rental income showed significant coefficients and were main determinants of income diversification in the study area. In conclusion, household head were low-income earners, though many of the household have more than one source of income and higher proportion of their income from non-farm sources. However, this result suggests means and methodologies to buffer farm income through increase allocation of productive assets; improving the production and profits will aid enterprise diversification.

Keywords: Diversity, Income, Livestock, Herfindahl index, Wage

INTRODUCTION

In Eswatini, 63% of the population lives in poverty and 89% of the poor, especially young people and women, live in rural areas. It is important to create new livelihoods through the development of the agricultural sector in rural areas so that rural people can build a better life for themselves and their families (ESAFF Eswatini, n.d.). Diversifying agronomic and non-agricultural activities in rural areas through the introduction of new entrepreneurial skills is critical to the development of rural businesses due to the variety of challenges faced by rural households in Africa. These problems manifest themselves in declining agricultural incomes due to post-harvest losses, price fluctuations, low productivity growth rates, migration, etc. (Stanovicic *et al.*, 2018).

Some of the challenges families face often force them to focus on non-agricultural activities, and these challenges vary significantly depending on the environment and income group (Katera, 2016). Ellis (2000) postulated that a key driver of diversification for individuals and/or families as a livelihood strategy is necessity or choice. According to Lay and Schuler (2007), the problem of diversification decisions appears to be largely driven by desperation rather than new opportunities, particularly with regard to migration. The share of income from non-agricultural sources is increasing significantly and is actually leading to income growth for the poorest, whose agricultural income is stagnating. From a static perspective, diversification appears to benefit the poor, but the analysis can also raise concerns. High non-agricultural growth rates are achieved by providing more work for the local non-agricultural

sector and migration, rather than by improving the productivity of diversification (Ijaiya *et al.*, 2011).

In the lean season, when market prices are generally higher, small farmers are more likely to run out of food and be forced to buy (Hjelm and Dasori, 2012). Therefore, if they do not participate in alternative livelihoods, the situation of these farmers could worsen. This is why income diversification is essential. Minot *et al.* (2006) defined income diversification as the shift from a single crop to a combination of food crops or crops with high commercial value (crop diversification) or the shift from agriculture to non-agricultural enterprises (diversification operations).

Asfaw *et al.* (2015) see diversification in the rural context as a dynamic adaptation process through which farmers respond to threats and opportunities, manage risks and generate additional income, thereby securing their livelihoods and improving their living standards. Rural households are diversifying their sources of income across all sectors, and non-agricultural sources contribute a significant share of total household income, especially for poor households. In many developing countries, including Eswatini, rural household income diversification strategies are not new, and most of these households have multiple sources of income. This may indeed include off-farm paid agricultural work but is also likely to include off-farm paid work, off-farm self-employment and paid rural work (Escobal, 2001; Schwarze, 2004; Awoyemi, 2011).

The diversification of activities in rural areas is of great importance for rural development, not only because of its expected impact on income and

poverty reduction, but also because of its importance for understanding migration movements and rural exodus (Démurger *et al.*, 2010). Rural families carry out various economic activities within the framework of complex income strategies. Agriculture is essential but often cannot be the main activity of rural families. Rural families' income strategies can be viewed as an active social process of diversification, involving the maintenance and continuous adaptation of various activities over time to ensure survival and improve living standards. According to Davis *et al.* (2014), a rural household may engage in multiple activities for various reasons: in response to market failures, for example in credit markets, so as to earn money to finance agricultural activities or agricultural markets, to purchase insurance and so to spread risks across different activities; inability of a business to generate sufficient revenue; or the different abilities and characteristics of different family members. Diversification into rural non-agricultural activities may therefore reflect activities in high- or low-return sectors. Non-agricultural activities in rural areas may or may not be countercyclical to agriculture over years and between years and, particularly when not highly correlated with agriculture, may act as a consumer smoothing or anti-insurance mechanism. risks (Davis *et al.*, 2014).

However, there is little literature on income diversification and income source diversification in Eswatini. Many studies (Adebayo *et al.*, 2012; Awoniyi and Salman, 2012 and avoiroye *et al.*, 2017) on income diversification in developing

countries, particularly in Africa, have focused on income diversification of households already engaged in agriculture and aim to diversify within and outside agriculture. Due to increasing income distribution, which can have implications for rural development, improving the livelihoods (income and poverty reduction) of individuals and families in rural areas and due to its importance for understanding migration movements and rural exodus. With such diversification into non-agricultural activities, family income represents a significant percentage and the availability of institutions for agricultural development would greatly facilitate access to credit instruments and ultimately improve incomes in rural areas (Ahmed, 2012). Therefore, this study specifically examines the determinants of income diversification among rural households in Eswatini.

METHODOLOGY

This study was conducted in four regions in Eswatini: Hhohho (north), Manzini (central west), Lubombo (east) and Shiselweni (south). Each region is divided into Tinkhundlas and there are 55 Tinkhundlas in Eswatini. The Tinkhundla, in turn, are divided into smaller kingdoms (imiphakatsi). Eswatini has an estimated population of around 1 million people, and the majority of the population still lives in rural areas (65%), although, as in all African countries and all countries in general, there is a growing movement towards cities (Eswatini Population and Housing Census, 2017).



Source: Adopted from Eswatini Population and Housing Census (2017)

The Eswatini Household Income and Expenditure Survey (EHIES) for 2016/2017 conducted by the Central Statistics Office (CSO) of the Ministry of Economic Planning and Development (MEPD) was used. This study used a multistage stratified sampling design. In the first phase of sampling, the population of the region was divided into separate groups corresponding to census tracts (EAs) using the cluster sampling method. A total of 288 census areas (Eas) were randomly selected. Therefore, all Eas had equal chances of being selected. In the second sampling stage, a fixed number of 12 households were selected from each of theselected areas with 3,456 households using a systematic sampling procedure. Of these, 3,355 people successfully completed the interviews, which corresponds to a household response rate of 97% (CSO, 2019).

Herfindahl Index

Income diversification was measured in this study using the Herfindahl Diversification Index (HDI). The HDI is based on the Herfindahl Index (HI), which measures the degree of concentration of income from different sources at the level of a single household. It is calculated as the sum of the squares of the income shares of each income source (Ersado, 2006). The Herfindahl index itself is becoming increasingly more concentrated; That is, a value of one represents a family with perfect specialization. Since the research is interested in diversification, i.e. the reversal of concentration, the HDI is calculated as one minus HI.

$$HI = \sum_{k=0}^n (Si)^2$$

where Si represents the share of income source i in total income, while n is the total number of income sources. The study disaggregated household income into the following categories: (1) crops, (2) livestock, (3) on-farm processing, (4) farm wage, (5) nonfarm wage, (6) nonfarm self-employment, (7) remittances, (8) transfer and (9) rents.

Tobit Regression Model – Determinants of income diversification

The structural equation in the Tobit model is:

$$y_i^* = X_i\beta + \varepsilon_i \dots\dots\dots (3)$$

where $\varepsilon_i \sim N(0, \sigma^2)$. y^* is a latent variable that is observed for values greater than τ and censored otherwise.

The explicit form is therefore expressed thus;

$$Y = \alpha_0 + \beta_1X_1 + \beta_2X_2 + \beta_3X_3 + \beta_4X_4 + \beta_5X_5 + \beta_6X_6 + \beta_7X_7 + \beta_8X_8 + \beta_9X_9 + \varepsilon$$

Where Y = income diversification index
 X_1 = Household size, X_2 = Dependency ratio, X_3 = Gender, X_4 = Marital status, X_5 = Education, X_6 = Age of household head, X_7 = Access to social grants, X_8 = Tropical livestock unit, X_9 = Rental income

RESULTS AND DISCUSSION

Table 1 revealed the distribution of the income of the respondents. The result was further decomposed based on the regions in the study area. For households in Hhohho, the average non-farm income receives the highest value of E4143.06 among the income groups followed by wage employment with value E3828.20, remittance with E464.57, farm income with E217.67 and social transfer worth of E83.14. In addition, the result revealed that in Lubombo region of the study area wage employment has the highest average income of E2233.44 followed by non-farm income with average income of E828.32 accruing for the households. The result showed average income through remittances valued at E364.16 for the households in this region and E271.67 and E101.31 for the farm income and social transfer respectively.

In Manzini region of the study area, the highest income (E3237.44) comes from wage employment, followed by non-farm income with E1738.99, E471.36 from remittances and E163.11 and E111.41 from farm income and social transfer respectively. And lastly, the result showed that about E3594 of the household income comes from non-farm income in Shiselweni region of the study area. From the aggregated data, it was revealed that the average farm income from the respondents stood at E228.01, the estimated non-farm income stood at E2616.91, wage employment (E2858.13) while remittance have a record of E429.74 and social transfer (E113.49). The average income accruing from wage employment stood at E1673.97, while 391.72, 288.49 and E168.68 accrued from remittance, farm income and social transfer respectively.

Table 1: Distribution of average income of the respondents according to region

Income sources	Pooled Average income	Hhohho Average income	Lubombo Average income	Manzini Average income	Shiselweni Average income
Farm Income	228.0134	217.0232	271.6687	163.107	288.4943
Non-farm Income	2616.9136	4143.061	828.3176	1738.987	3593.747
Remittance	429.7402	464.5732	364.1649	471.3551	391.7184
Wage employment	2858.1329	3828.203	2233.441	3237.436	1673.966
Social transfer	113.4869	83.13817	101.3117	111.4101	168.6786

Source: Author’s Compilations, 2022

Table 2: Distribution of share of household income according to region

Income sources	Pooled Share of % income	Hhohho Share of % income	Lubombo Share of % income	Manzini Share of % income	Shiselweni Share of % income
Farm Income	8.13	7.57	7.90	8.35	10.22
Non-farm Income	19.45	17.90	17.24	20.67	22.02
Remittance	21.63	22.36	22.80	21.01	20.43
Wage employment	41.44	45.42	45.41	43.09	34.80
Social transfer	9.35	6.75	6.65	6.88	12.14
Total	100.00	100.00	100.00	100.00	100.00

Source: Author's Compilations, 2022

On Table 2, the result indicated that most of the households' incomes are from wage employment. The result also showed that 45.42 percent of the household income in Hhohho was from wage employment, 22.36 percent was from remittance, 17.90 percent was from non-farm income while 7.57 percent and 6.75 percent were from farm income and social transfer respectively. Also, the result shows similar trend in other regions of the study area. In Lubombo, wage employment has the highest proportion (45.41 percent) of the household income, followed by remittance (22.36 percent), non-farm income (17.24 percent), while 7.9 percent and 6.65 percent are for farm income and social transfer respectively. The aggregated data on Table 10 above revealed that the highest proportion of the household income comes from wage employment (41.44 percent), followed by remittance with 21.63 percent. About 19 percent share of the households' incomes accrues from non-farm income source while 9.35 percent and 8.13 percent were from social transfer and farm income respectively.

Furthermore, the result revealed that income from wage employment gives the highest proportion of the household income, followed by remittance (21.01 percent) and non-farm income (20.67 percent). Only 8.35 percent and 6.88 percent share of the total income are sourced from farm income and social transfer respectively. The result was similar with households in Shiselweni where 34.80 percent of the share of the total income emanate from wage employment, slightly above 22 percent comes from non-farm income, 20.43 percent from remittance while 12.14 percent and 10.22 percent are from social transfer and farm income respectively.

The result presented in Table 3 showed the distribution of the respondents' extent of income diversification based on the regions. In the disaggregation data as recorded for Hhohho region, it was observed that 98.63 percent of the respondents in this region had more than two sources of income, 0.95 percent had not more than two income sources while only 0.42 percent have only one source of income. The result equally revealed that 98.88 percent, 97.47 percent and 94.98 percent of the respondents had more than two source of income for Lubombo, Manzini and Shiselweni respectively. About 5 percent of the respondents in Shiselweni had not more than two sources of income, 1.62 percent in Manzini and only 0.42 percent in Lubombo.

Generally, Manzini region recorded the highest proportion of the respondents that have not diversify from their primary source of income, though it was not significant number compared to the number of the household that have diversify. In addition, there is no household that have not diversify in Shiselweni region of the study area and this same region had the highest proportion of respondents who had not more than two sources of income. Also, it was observed that the aggregated data showed that most (97.57 percent) of the respondents had more than two sources of income - the implication of this is that they are highly diversified. Only 1.9 percent of the respondents had not more than two sources of income while 0.53 percent of the respondents only have a source of income for the households. The implication of the result was that most of the respondents have diversified their income source i.e., they have more than one source of income for their respective households.

Table 3: Distribution of the Respondents by the extent of income diversification according to region

Herfindahl indices	Pooled		Hhohho		Lubombo		Manzini		Shiselweni	
	Freq	Perc	Freq	Perc	Freq	Perc	Freq	Perc	Freq	Perc
Not diversified (HI=1.0)	18	0.53	4	0.42	5	0.70	9	0.91	0	0.00
Moderately diversified (1.0<HI<2.0)	64	1.90	9	0.95	3	0.42	16	1.62	36	5.02
Highly diversified (HI>2.0)	3,289	97.57	936	98.63	708	98.88	964	97.47	681	94.98
Total	3,371	100.00	949	100.00	716	100.00	989	100.00	717	100.00

The household size, as shown in Table 4, is positive and statistically significant at 1% (p -value is 0.000). The findings further expound that the increase in the household size means that for each unit increase in household size will lead to increase in likelihood of diversifying household income by 0.0108. This implies that those who have larger household sizes have higher chance to income diversification in the study area. This could be related to the fact that most of the household member may engage in one or more income generating activities. Igwe *et al.* (2018) in their finding established the nexus of household size and income diversification, their result revealed positive relationship –indicating household member engages in more economic activities that could give them better living.

The study looked at education predictor variable and found evidence that for each unit increase in education level there will be increase in the chance of households diversifying their income as shown in Table 4. The findings mean that respondents with more education are likely diversifying their household's income source(s). The p -value is 0.000; it indicates that the education is positive and statistically significant at 1% significance level. The result was in tangent with the findings of Agyeman *et al.* (2014) and Igwe *et al.* (2018) where number of years of education was statistically significantly influence income diversification in Ghana. Higher level of education could give more chances for attracting high paid job and also influence the online business activities which households could source more income and invariably increase their wellbeing.

Gender plays a significant role in diversification of households' income source. As most women are key players in agricultural processing and marketing, males were more into production. This study revealed that increase in male will less likely increase income diversification in the study area. This implied that the more the male household' head the less likely diversification of income source of the households. Male household head may cohort their spouses in the same businesses that they engage in (family business) and this will streamline their source of income. Therefore, have less chance of increasing their income source.

The number of dependants within the household may likely decrease the chance of diversification of household income. The result presented on Table 4 revealed that increase in dependency ratio will decrease the likelihood of diversification of income in the study area. The result implied that the more the household member who depend on the income of the head for a living, the less the diversification

of income. Schwarze and Zeller (2005) reported significant relationship and impact of dependency ratio on the share of non-agricultural income sources and affirm that income from household with large number of dependants will influence diversification of income.

Social grant is another source of income for the poor and vulnerable. Depending on the National programme and the targeted audience, many countries in Africa, Eswatini inclusive roll out social intervention for the poor and vulnerable in the society. The result presented on Table 4 showed that access to social grant will increase the probability of diversification of income in the study area. The result indicated that households who have access to social grants will have more than one income source to enhance the households' wellbeing.

Raising livestock is one of the ways in which rural households' increases income for better living. Many rural families raise either/both ruminants (Cattle, sheep and goat) and non-ruminant animals such as poultry. This is one of the off-farm income sources for the farm families and also for those households who primarily lives in rural area. The result as presented on Table 4 revealed that increase in raising livestock will increase the likelihood of diversification of household income. Since, it is one of the methods used by rural household to increase their wealth; it is therefore an important source of rural income. The implication of the result was that the more the households in the study area raise livestock the better the chance of income diversification.

Lastly, the result in Table 4 showed the coefficient of rental income to be positive and significant at 1 percent level of significance. A unit increase in rental income will increase the likelihood of income diversification by 0.1384. The result indicated that households with rental income will have increased chance of diversifying their income source than those who doesn't have. This is an additional income base for the households, and it will increase the opportunities and wealth for the households. In summary, households can be either pushed or pulled into income diversification, depending on the context. If the reason is as a result of distress-push diversification, it could imply that the poorer households might be more involved in off-farm diversification than richer ones. On the other hand, in the case of predominantly demand-pull diversification, one would expect richer households to be more engaged in off-farm activities. In reality, both distress-push and demand-pull diversification can occur simultaneously among a sample of rural households at a given point in time.

Table 4: Parameter estimates of factors influencing income diversification

Variables	Coefficient	Std. Err.	t	P> t	Odd ratio
Household size	0.0108	0.0011	9.76	0.000***	4.2877
Dependency ratio	-0.0045	0.0017	-2.72	0.007***	2.0664
Gender	-0.0084	0.0032	-2.61	0.009***	0.4892
Married	0.0015	0.0033	0.45	0.655	0.4892
Education	0.0019	0.0003	6.16	0.000***	6.0908
Age	9.43e-06	0.0001	0.08	0.934	46.9789
Access to Social grant	0.0799	0.0038	20.56	0.000***	0.4390
Livestock	0.0992	0.0033	29.40	0.000***	0.4625
Rental income	0.1385	0.0108	12.85	0.000***	0.0202
Constant	0.0957	0.0063	15.31	0.000***	
diagnostics					
LR chi2(9)	= 2253.38				
Prob> chi2	= 0.0000				
Log likelihood	= 3439.6373				
Pseudo R ²	= -0.4871				

Source: Author's Compilations *** statistically significant at 1 percent

CONCLUSION

With respect to income diversification, the study concluded that Manzini region has the largest number of households that have not diversify from their primary source of income whereas there is no household in Shiselweni that have not diversify their income source. From the study, households diversified around the portfolio of income identified in the study. In addition, the main driver of income diversification in the study area includes dependency ratio, sex, household size, and education, access to social grant, livestock holdings and rental income. , rural economy is largely dependent on agriculture and it forms the essential part of livelihood assets of the rural populace. This study, however, suggests means and methodologies to buffer farm income through increase allocation of productive assets; improving the production and profits will aid enterprise diversification. Policies that drive women into agricultural production, value addition should receive more support and sustained.

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