



Factors Influencing Transient Poverty Among Maasai Pastoralists Households in Semi-Arid Areas of Simanjiro District, Tanzania

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Abstract: *There are two discourses on the feasibility of pastoralists' livelihoods. The first maintained that pastoralism is still a feasible approach if suitable development ingenuities link rural households to markets. The second discloses the fact that pastoral livelihoods are depressed and unviable due to political side-lining, drought, and inadequate institutional support (markets and education). Consequently, poverty associated with the seasonal fluctuation of income (transient poverty) remains intense among pastoralists. This study determined factors influencing transient poverty among pastoralists in Simanjiro District, Tanzania. The study adopted a cross-sectional research design. Purposive and random sampling techniques were employed to select representative samples. Data collection methods comprised household surveys with 100 Maasai pastoralists, 4 focused group discussions (FGDs), and 20 key informants interviews. The regression model was used to determine the relationship between poverty and hypothesized-explanatory variables. The findings show that household heads who had never been to school have a higher likelihood of being trapped in transient poverty (statistically significant at $p < 0.05$ in logistic regression). The herd size shows a significant effect on transient poverty i.e., the more the herd size the less likelihood of households being trapped in transient poverty holding other factors constant. Geographical proximity (distance to markets, water sources, and pasture fields) has a significant effect on transient poverty. The more the distance to markets, water sources, and pasture fields the higher the likelihood of households being trapped in transient poverty holding other factors constant. The poverty status of the household is highly associated with the level of physical access to markets, water sources, and pasture fields. Theoretically, the study contributes at different levels. First, contributes to the role of educational profile in transient poverty persistence, by showing how returns to education reduce transient poverty likelihood. Second, contributes to the factors for transient poverty, by showing the effect of geographical proximity on transient poverty. Lastly, contributes to the role of livelihoods diversification, by showing having multiple livelihoods strategies reduces transient poverty.*

Keywords: *Transient poverty, Maasai pastoralists, pastoralists' livelihoods, pastoralism, semi-arid areas*

1.0 Background Information

In Africa, many pastoralists' households have increasingly settled in response to the problem of curtailed mobility and shrinking grazing areas. Households in marginal pastoral areas are characterised by few resources, low income, low level of human and social capital, and limited access to markets and service institutions like credit institutions and extensions (Nakuti, 2017). Livestock production is the main source of income in addition to other crop and non-farm income sources such as selling labour and seasonal migration (Mung'ong'o and Mwamfupe, 2003). Pastoralists' household main sources of income areas are characterised by seasonal fluctuations, which force people to engage in many activities like non-farm income sources. This results in environmental

degradation and rural-urban migration, and hence curtailed development (World Bank Group, 2020).

Poverty tends to be more prevalent in the arid and semi-arid lands than in the higher potential regions of East Africa (Mashindano and Maro, 2011). Finding ways to improve the food and nutrition security of households and reduce poverty in the dry lands has, therefore, become a key policy issue (Moshia *et al.*, 2018). Therefore, strategies to reduce the number of people directly dependent upon the primary resources of the arid and semi-arid lands, and improve the productivity of those resources must be sought urgently.

Poverty is not static, households often move in and out of poverty from time to time. This is unsurprising in East Africa, given that the economies of East African countries mainly depend on land-based production systems and are affected by seasonality and highly variable climatic conditions. Changes in poverty status can be due to economic cycles and shocks, such as poor weather, or the loss of a major income earner through death, injury or long illness. In addition, institutions for income and consumption smoothing in these economies are either inadequate or are absent altogether (Tiampati, 2015). Nonetheless, some households do manage to escape poverty, while others remain in poverty for extended periods. Understanding what factors drive household movements in and out of poverty is extremely important for the design of poverty reduction strategies, and is still an open area for research (REPOA, 2020). However, to address poverty among the pastoralists' communities, governments, non-governmental organisations and international agencies must understand more clearly the geophysical, economic and cultural environments within which they live as well as their livelihood systems (Kinyondo and Pelizzo, 2018).

It is also worth noting that, Tanzania has made significant developmental achievements, however, poverty persists in both urban and rural areas, especially among populations practising agriculture and livestock keeping (World Bank Group, 2020). The income poverty headcount ratios for Mainland Tanzania regions are said to be 34.2% in the Shinyanga region, 18.3% in the Manyara region, 14.7% in Arusha, and 14.3% in Kilimanjaro and 32.6% in the Tabora region (THDR, 2017). Despite having a lower percentage in Manyara, Arusha and Kilimanjaro regions, the information shows there is persistent transient poverty (associated with a fluctuation of income around the poverty line) among pastoralist Maasai a nomad community in Tanzania (Mung'ong'o and Mwamfupe, 2003). Their livelihoods are largely dependent on keeping mainly cattle, sheep and goats (World Development Perspective 2019). Among the Maasai, cattle are a key source of livelihood, and a symbol of wealth, prestige and success (Homewood and Trench, 2009). This study, therefore, was conducted to determine the factors that influence transient poverty among pastoralists' communities in semi-arid areas of Tanzania, using Simanjiro District as a case study.

Tanzania has the second largest livestock population in Africa and more than 51% of its landmass is inhabited by pastoralists and agro-pastoralists (Pelizzo *et al.*, 2018; THDR, 2017; Lusambo, 2016). Tanzanian pastoralists raise a large portion of the national herd, estimated at 42% of the cattle, 25% of the goats, 7% of the sheep, and 20% of the donkeys (THDR, 2017). There are two debates on the viability of pastoralists' livelihoods in this 21st century. The first one argued that pastoralism is still a viable strategy if appropriate development initiatives link rural households to

the markets (Leiden, 2008), while the second discloses the fact that pastoral livelihoods are depressed and unviable (Kinyondo and Pelizzo, 2018) due to political marginalization (World Bank Group, 2020; Mung'ong'o and Mwamfupe, 2003; Tiampati, 2015), resource depletion, and drought (Tiampati, 2015); lack or inadequate institutional support like market, education, health services (Kinyondo and Pelizzo, 2018; Lusambo, 2016; Jerve and Ofstad, 2000). As a result, transient poverty remains intense in pastoral areas of Tanzania (Mashindano and Maro, 2011; Zupi, 2007; Mensah, 2006; Karshenas, 2001). For instance, pastoral groups in Simanjiro District have been neglected in terms of research and development programmes (REPOA, 2020; World Bank Group, 2020).

While there has been a strong urge from the government to settle pastoralists as a solution to combat transient poverty (Nakuti, 2017), others propose access to free grazing and mobility as key factors of poverty reduction in pastoral areas (Nakuti, 2017; Mosha *et al.*, 2018). Thus, the issue of transient poverty reduction strategy in pastoralist communities of Tanzania, and how best to respond to it, remains debatable. Even though different actors have different perspectives, in more recent development debates, pastoral destitution and transient poverty are often attributed to conflict, climate change and weak governance (Mollel, 2011).

Most studies dealing with transient poverty in the pastoral areas paid little attention to household-level factors that correlate with transient poverty at the community level, they often focused on the understanding of wealth stratification (REPOA, 2020) which does not grasp household-level severity and transient poverty gaps. Therefore, this study analysed transient poverty based on household-level data by identifying the factors for transient poverty in pastoral communities of Northern Tanzania, using Simanjiro District as a case study. Specifically, the study examined educational profile, production system factors and the income strategies underlying transient poverty. Likewise, three key questions guided the study:

- i. What are the educational profile of the Maasai pastoralists' communities and their influence on the transient poverty persistence in the Simanjiro district? (*i.e., the influence of educational profile on access to information, decision making, income and number of livelihood sources/portfolios*)
- ii. How do production system factors influence transient poverty among Maasai pastoralists' communities? (*i.e., herd size, distance to pasture, distance to water point, distance to nearest market*)
- iii. What are the income strategies among the Maasai pastoralist households? (*i.e., livestock productivity, nonfarm activities, investment on land*)

Finally, the study recommends policy strategies to reduce transient poverty among pastoralists.



2.0 Theoretical and Conceptual Frameworks

2.1 Theoretical Foundation

In general, the geographical theories of poverty proffer explanations for the spatial distribution of poverty. In trying to answer why some places become poverty traps and others do not, the theories bifurcate into deterministic and possibilistic perspectives (Hansen, 1970 cited in Bradshaw, 2006). The former tends to focus on the influence of the physical landscape in causing poverty, while the latter's focus is on "spatiality" or the interaction between the physical conditions and human processes to give poverty outcomes. Determinists usually seek to identify the physical characteristics that result in "spatial poverty traps". Early works of writers such as American geographer Ellsworth Huntington tended to credit the physical environment, especially climatic conditions, with determining development outcomes (Bradshaw, 2006). Thus, polar and tropical regions such as semi-arid areas were seen as being predisposed to poor economic development outcomes, while the mid-latitudes were considered more stimulating and hence offered better prospects for economic development. Possibilistic thinking suggests that the physical environment merely influences rather than determines development outcomes, and hence poverty. For example, marginality and remoteness of a place are only seen as influencing the co-production of underdevelopment and spatial poverty traps when we take account of the specific 'spatiality' of the area. This means, that rural areas only become poverty traps because of the nature of development decisions that are taken and the role ascribed to the rural-space economy in the development processes.

The criticism of the theory is that the argument that poverty is most intense in certain areas is an old observation, and explanations abound in the development literature about why regions lack the economic base to compete. Recent explanations include disinvestment, proximity to natural resources, density, diffusion of innovation, and other factors. Weber and Jensen (2004) in Bradshaw (2006) noted that most literature finds a "rural differential" in poverty, but that the spatial effect is not as clearly isolated from individual effects.

Places left behind experience the largest competition in the restructuring of the rural economy. An increasing body of literature holds that advantaged areas stand to grow more than disadvantaged areas even in periods of general economic growth and that there will be some "trickle-down" but not an equalizing as classical economists would have us believe. Another perspective involves selective out-migration important for this study, as in the case of the recent pastoralists' societies in searching for pasture and water points for the livestock. Generally, the geographical theory of poverty, asserts that poverty is a result of the fact that

people, institutions, and cultures in certain areas lack the objective resources needed to generate well-being and income, and that they lack the power to claim redistribution. It, therefore, depends on where people are.

To sum up, according to Geographical Theory it has been shown that there are, in the contemporary world as in the old world, many causes of poverty which also lead to a specific type of poverty, for instance, transient poverty. The culture of poverty asserts that poverty is inherited and is thus a part of the culture. The theory asserts that individuals are not necessarily to blame because they are victims of their dysfunctional subculture or culture (Bradshaw, 2006). In other words, poverty is transmitted from one generation to another. This may be to some extent a reality in the pastoralist community where young generations inherit some ways of living from their predecessors which do not help them to get rid of poverty. Thus, they adhere to some sets of beliefs, values and skills which are not helpful to them.

2.2 Conceptual Underpinnings

The conceptual framework for this study considers the factors (explanatory variables) affecting the transient poverty (focused variable) among the pastoral communities ranging from an educational profile which influences access to information, decision making, income and number of livelihood sources/portfolios. Other factors include production system factors (i.e., herd size, distance to pasture, distance to water point, distance to nearest livestock market); income strategies; and land management being the potential factors that influence transient poverty among the Maasai communities. Therefore, these are assumed to be the potential factors that influence the transition of poverty by this study as illustrated in Figure 1.

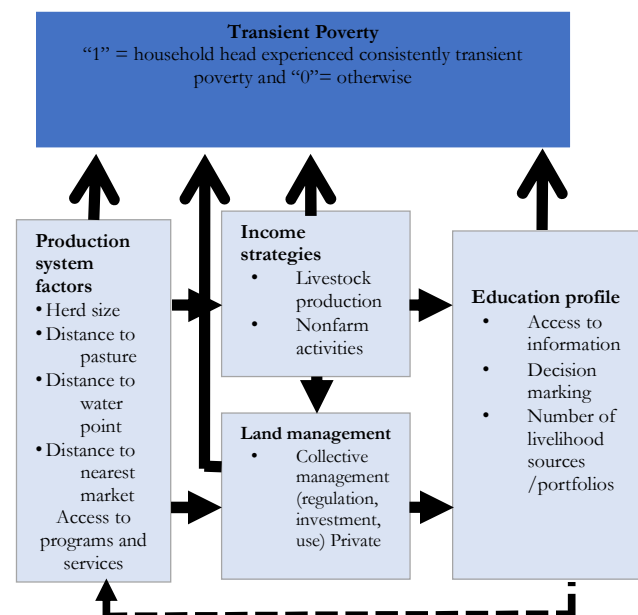


Figure 1: Conceptual framework of the study modified by the author from the original notions of the Geographical Theory of Poverty

3.0 Methodology

3.1 Study Area, Design, and Sampling

Approach

The study was purposively conducted in Simanjiro District because of a large number of Maasai as compared to other Districts in Northern Tanzania. Simanjiro District headquarter is located in Orkesumet which is a Maasai word meaning “*long wells of water*” (Mosha, Lotegelwaki, and Nyakwaka, 2018). The study did not cover the whole of Simanjiro District; instead, specifically, it was conducted in Sukuro village of Komolo ward and Emboret village of Emboret ward. The rationale for choosing this particular geographical area, mainly the two villages (Sukuro and Emboret), stems from the ground that the area has a large number of pastoralist Maasai as compared to other neighbouring villages. Among the villages of the Simanjiro district, Emboret and Sukuro are the most populated with pastoralists Maasai. But also the land-use changes in these villages such as the conversion of grassland to plantation promoted a succession of invasive plant species which are not eaten by livestock and wild animals.

For this study, the cross-sectional research design was adopted. This type of research design facilitates the researcher to examine a section of the population at a single time (Kothari, 2004). The rationale for adopting this type of research design is based on time i.e. the study is not repetitive – the collection of data was done and finalised once at a particular time. Likewise, the nature of this study necessitated the use of a mixed methodological approach involving qualitative and quantitative paradigms to enable the collection of rich data to sufficiently capture information from households. This is because the methodological positions of the two paradigms are not fundamentally opposed to each other. Therefore, the study uses both by triangulating to fit the study objectives (Bazely, 2003).

According to Kothari (2004), for a sample to be representative enough for statistical analysis, it is recommended that at least a total of 10% of the entire population be taken for study. Information from the office of the Administrative Secretary of Simanjiro District indicates there is an average population of 10500 people living in both Emboret and Sukuro villages. Among the 10500, it is estimated that the adult population is 3035 and out of these, 1200 are estimated to be involved in livestock keeping or pastoralism (Ibid). This study comprised a sample of 120 respondents.

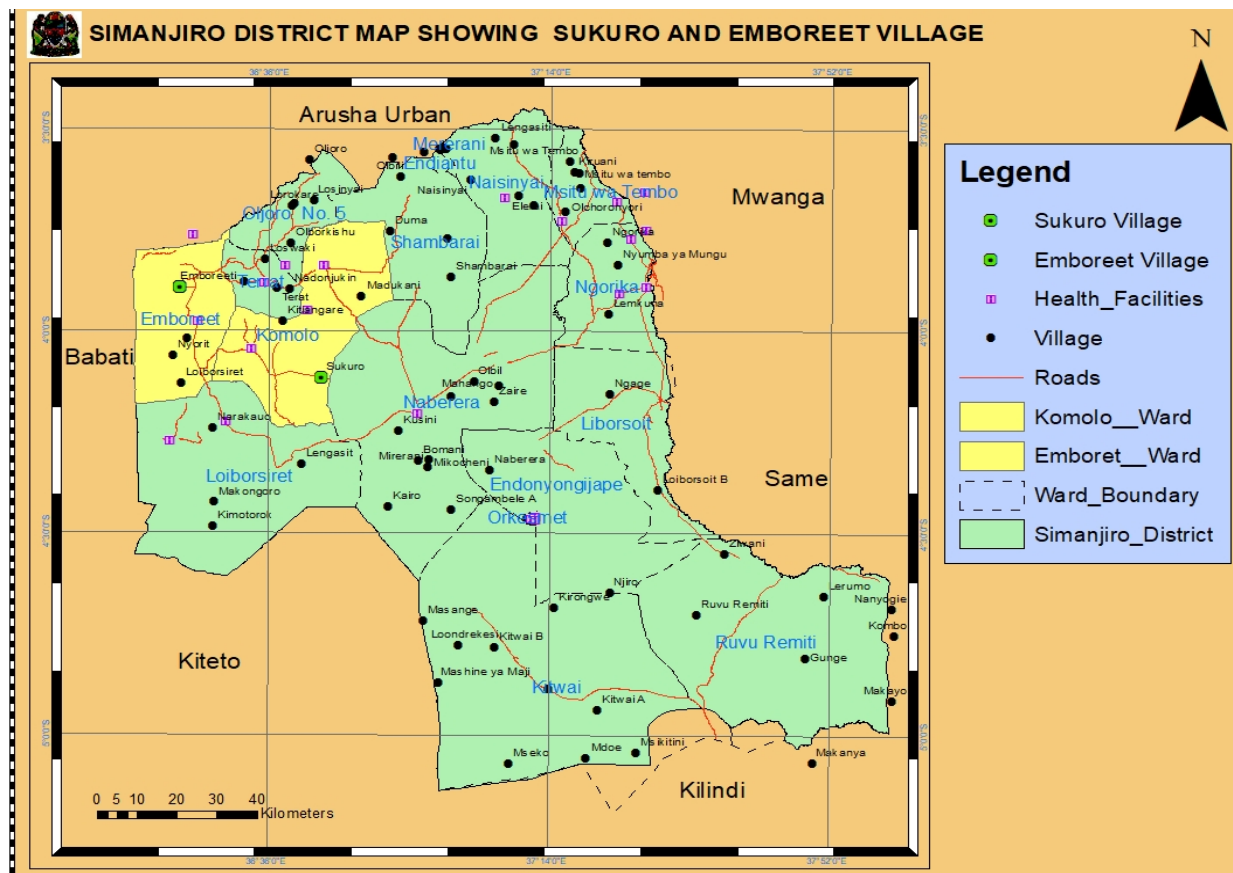


Figure 1: The Map of Simanjiro District Showing Selected Areas of Study (Sukuro and Emboret Villages)

They consisted of 100 pastoralists Maasai household-heads being male and female pastoralists, 20 key informants which



included; 10 local leaders, religious leaders who are directly involved in the leadership affairs of the community, and 10 representatives of Civil Society Organizations working on poverty reduction activities. The statistical formula below was followed to obtain a required sample provided by Cochran (1977):

$$n = \frac{Z^2 pq}{e^2}$$

Where: Z= Standard normal score at 1.96 as corresponding to a 95% confidence level, e = the desired level of precision or degree of accuracy set at 10% (0.10), p = the estimated proportion of an attribute that is present in the population (signifies the percentage of the targeted population estimated to have particular characteristics, if not known we use 50%) and q = 1 – p

$$n = \frac{1.96^2 * 0.5 * 0.5}{0.1^2}$$

Therefore, the total sample was 97 and it was approximated to 100 Maasai pastoralist household heads to get better statistical results. Table 1 summarizes the total samples for both categories.

Table 1: Distribution of the Study Participants

Respondents	Number
Maasai pastoralist household-heads	100
Local and religious leaders	10
CSO representatives	10
Total	120

The convenience sampling technique was adopted to select 100 pastoralist Maasai household heads based on their availability and willingness to respond. Furthermore, the purposive Sampling Technique was adopted to select 20 key informants with expertise and experience in the problem under investigation. But also cluster sampling technique was adopted to select Sukuro and Emboret villages from many villages in Simanjiro District based on the fact that they have many pastoralist Maasai than other villages.

3.4 Instrumentation

The instruments for collecting data were therefore selected depending on the type of data the study collected. To collect the data needed, the study used a questionnaire for 100 Maasai households survey, an interview guide for an interview among the 10 key informants (local leaders and Civil Society Organisations) and a checklist for 4 focussed group discussions (FGDs) methods for collecting primary data.

During the study, first, a review of the literature was conducted to better understand the aspects of transient poverty and how to operationalize it in the field. Second, a preliminary list of review items was established and shared

among other psychometry experts at the University of Dodoma for further development.

3.5 Data Processing and Analysis

The processing and analysis of data were done using the IBM (SPSS) and Excel software. This study assumed a set of factors that influence the transient poverty status of pastoral households. The variables include “education of household head”. The level of education attained by the head of a household is expected to influence access to information, decision making, income and consequently livelihood security of a household. Transient poverty of a household, is, therefore, expected to decrease as the level of education of its head increases. This is because educated household heads are likely to have higher income earning potential and more alternative income-earning opportunities. Other variables assumed by this study are in the “production system”, such as, “herd size”, “distance to pasture”, “distance to the water point” and “distance to nearest market”. Therefore, data analysis involved descriptive statistics and a binary logistic regression model. The binary logistic regression technique was used to determine the relationship between the likelihood or probability of household heads experiencing consistently transient poverty and the explanatory/independent variables. To eliminate multicollinearity, correlation analysis of predictor variable were conducted to identify variables, which are significantly correlated before performing a regression.

To estimate the “likelihood of household head being consistently trapped in transient poverty”, data were fitted to a binary logistic regression model. The following model and its parameters were used:

$$\ln \frac{P}{1-p} = B_0 + B_2 X_i + Q_i + e_i$$

Where (P /1-p) is the odds of the household head experiencing consistently transient poverty (P is “1” if the household head experienced consistently transient poverty and “0” otherwise), B₀ is constant, B₂ is an estimate of the independent variable, X_i is the independent variable of interest, Q_i is a vector of control variables (e.g. age, sex, education), e_i is the error term or unobserved factors and ln is the natural logarithm.

4.0 Findings and Discussions

4.1 Demographic Characteristics of Respondents

Socio-economic characteristics are presented in Table 2 below. Results indicate that, on average, males were 78% of the respondents. This could have happened by chance. In terms of age, respondents were between 24 and 68 years (average of 45 years and standard deviation of 10 years). Others (26.1%) were elders aged more than 55 years old. The age groups mean that the majority were economically active. In terms of education, more than half of respondents (69%)



had primary education and above, implying that the illiteracy level was still high. Regarding household size, the number of members in the household ranged from 5 to 16 people (average of 9.6 and standard deviation of 2.26) as shown in table 3. Findings from these studies seem to correlate to previous studies done in the same area. The study was done by Nkedianye *et al.*, (2020) reported an average age of household head of 48 years. In another study by Yanda and William (2010), it was found that the majority of the respondent had primary education followed by informal education. Very few respondents (< 5%) were found to have secondary education and above. This implies that there is limited access to higher education (secondary and above) in the study area.

However, the household size reported in this study was found to be a bit higher compared to the results of the Tanzania National Census of 2012. According to the census, the average household size in the Emboreet ward was 5.3 (NBS, 2012). The variation in the household size could be attributed to several reasons. First, this study used the representative population of Simanjiro District while the census include the entire population. Second, the study focused on Emboreet and Sukuro villages while the census included the entire geographical area (all villages) in Simanjiro District. Lastly, the difference in duration between this study and the last census. It is 9 years since the last census was conducted, implying that the household size could have increased because it was projected that the population will continue to increase.

Table 2: Discrete Socio-demographic Variables

Variable		Frequency	Percent (%)
Sex	Male	78	78
	Female	22	22
Education Level	Never been to school	31	31
	Primary education	49	49
	Secondary education	12	12
	Tertiary education	8	8

Table 3: Continuous Socio-demographic Variables

Variable	Min.	Max.	Mean	Std. Deviation
Age	24	68	44.87	9.84
Household Size	5	16	9.6	2.26

4.2 Asset Types and Distribution

Figure 3 shows various types of assets owned by the households in the study villages in the Simanjiro district. As is seen in the figure, all respondents (100%) owned the livestock and land. Less than 15% of respondents owned motorcycles and solar panels. Regarding the number of assets owned by households, the result (table 4) indicates the

vast majority of respondents (46%) owned two assets followed by 34% of respondents who owned three assets. Very few respondents (5%) owned five assets. This implies that the majority of households can own multiple assets. Land and livestock are the major assets due to the Maasai production system which entirely depends on these two assets. Livestock in particular the cattle are perceived as the prestige and measure of wealth in the Maasai community. For this reason, Maasai people feel proud to own a large herd size to maintain social status. Also, the size of the herd is regarded as the measure of wealth or prosperity. For the household to be regarded non-poor household then it must possess a certain number of cattle. In the FGD, participants stated that a better-off household (non-poor) must possess at least 30 cattle. However, very few households (outlier) possess a large herd size approximate more than one thousand cattle. These are probably the 95th percentile in the wealth or asset possession ladder in the Maasai community.

In the interview with KI (Maasai Elder), it was revealed that Maasai people have started to own iron roof houses and motorcycles, and even vehicles due to the increased income from livestock sales and mining activities at Mererani. The individuals involved in the mining business in particular the sale of Tanzanite gemstones have managed to make big profits and this puts them in a better position to afford expensive properties such as vehicles. He further claimed that modern civilization is slowly increasing in the Maasai community due to the globalization process and increased interaction with the outside communities. This has resulted in the diffusion of the new culture and lifestyles in the Maasai community.

Furthermore, it was also important to understand asset ownership and distribution from the gender lens because of the different power over assets that exist in the Maasai community (Nkedianye, 2010). The results revealed that regardless of increased asset accumulation at the household level but women have continued to lack access to ownership and decision over important assets in the households. This is also supported by findings from the FGD, whereby members of FGD reported that men and women have continued to own different types of assets at the household level in the Maasai community. The livestock in particular cattle, goats, and sheep are owned by men while donkey and poultry (such as chicken) are owned by women.

"In our Maasai community, donkey and chicken are owned by women. This is because women's role is to fetch water for their households, and therefore they use a donkey. Women sell chicken to earn income. Men own cattle, sheep and goats. However, women can also own a few cattle (such as 5 cattle), and they are given these cattle by their husbands" (Member of FGD)

The above claim by the participant of FGD indicates that women have limited access and power over important household assets and resources. On the other hand, men



continue to possess ultimate power over the use and distribution of household assets and income. This situation has negative implications for the socio-economic and political conditions of women because it denies them the important right to influence decision-making on the use and distribution of household assets and income. These results concur with previous studies on a similar subject. The study by Nkedianye (2010) found that men have high power over the purchase and sale of household assets such as livestock while women possessed small or no power in the Maasai community in Kenya. Their study also found that women have more power over poultry (such as chicken) and they can sell poultry to earn an income. Comparatively, women become more vulnerable to poverty as compared to men.

In general, the Maasai community largely depend on the natural assets to sustain their livelihoods and well-being. The adverse changes in these assets could lead to negative impacts on livelihoods as well as increasing poverty levels. Also, despite the evidence that asset accumulation has increased at the household level but transient poverty continues to persist because it relates to the income fluctuations that occur from time to time and this does not correlate to the asset ownership and accumulation.

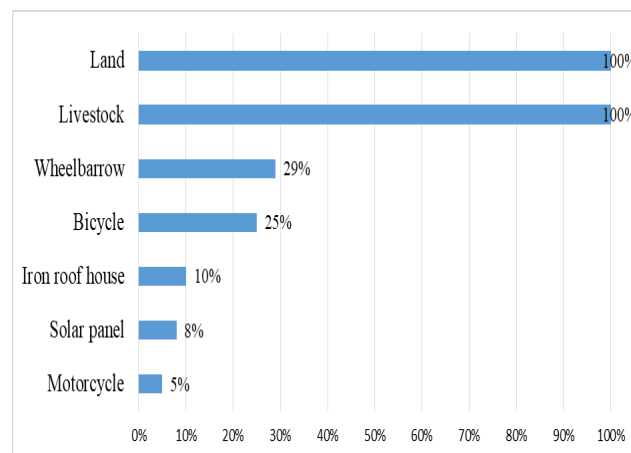


Figure 1: Asset Distribution

Table 4: Number of Assets Owned by Household

Number of Assets	Frequency	Percent (%)
2	46	46
3	34	34
4	17	17
5	3	3
Total	100	100

4.3 The Influence of Education Profile on the Transient poverty

Table 5 shows the estimated effect of education on the frequency of transient poverty. As shown in the table, the education profile of respondents is statistically significant ($p < 0.05$) in the logistic regression model. The model explains about 53% (Nagelkerke R^2) of the variance in the response

variable, this indicates the model provides a good fit to the data. The model accurately classified 86% of all cases. The regression coefficients (Table 5) suggest that the odds of household heads who have primary education to experience consistently transient poverty decreases by 97.2% as compared to those who had never been to school holding other factors (age and household size) constant. Similarly, the odds of household heads who secondary education to experience consistently transient poverty decreases by 95.6% as compared to those who had never been to school holding other factors (age and household size) constant. Also, the odds of household heads who tertiary education to experience consistently transient poverty decreases by 97% as compared to those who had never been to school holding other factors (age and household size) constant. However, a non-significance difference was noted in the effect of the levels of education on reducing the persistence of consistently transient poverty. This suggests that any level of education affects reducing consistently transient poverty. It is assumed that people who have acquired formal education possess skills and abilities which make it easy for them to engage in different income generation activities. By doing so, people able to earn additional income or diversify their income sources. Ultimately, this leads to the reduction of transient poverty at the household level. On the other hand, household heads who had never been to school could have limited opportunities to earn an additional income due to a lack of certain skills and abilities. Further, the majority of the household heads who have never been to school tend to rely on a single livelihood (livestock keeping) and when productivity decline due to various reasons such as natural shocks, then they become more vulnerable to falling into the consistently transient poverty trap.

The results from this study seem to be consistent with previous studies on a similar subject. The study done by Awan *et al.* (2011) found that household poverty level and the level of education of the household head were negatively associated. They concluded that education affects poverty reduction. In another study done by Nkedianye *et al.* (2020), it was found that level of education of the household head has a significant effect on poverty reduction. Another study by Adunga (2013), found that return to education has a significant positive correlation to an increase in household income. This implies that household heads possessing higher education on average earn more income than their counterparts.



Table 5: Logit Estimation: Factors Influencing Transient Poverty

Predictor Variables	B	S.E.	Wald	Exp(B)
Primary Education	- 3.581	.673	28.292***	.028
Secondary Education	- 3.134	.939	11.142***	.044
Tertiary Education	- 3.509	1.199	8.569***	.030
Household Size	.151	.132	1.297	1.163
Age	.001	.031	.000	1.001
Constant	.122	1.937	.004	1.129

*** Significant at 5%

4.4 The Influence of Education Profile on Decision Making

The study investigated the influence of education on decision-making. Participation in the village assembly was used as the outcome variable because it was assumed that those who participated in those meetings were likely to influence the decisions made. The result (Table 6) shows that the education profile of respondents is not a statistically significant ($p > 0.05$) variable in the logistic regression model. This implies that the level of education of the household head does not influence the likelihood to participate in village meetings. Hence there are other potential factors apart from education that might significantly influence the likelihood of participation in the decision-making process at the village level. Even when controlling for other predictor variables (such as socio-demographic variables such as age and household size) in the model, still the predictor variables remain statistically insignificant. The expected hypothesis that the respondents with a lower level of education don't frequently participate in village meetings was not confirmed by the results

In the KII and FGD, it was also revealed that villagers at Emboreet and Sukuro villages were actively participating in village assemblies. Participants stated that in the Maasai culture, it is normal to participate in social gatherings and events. This could probably explain why people were actively participating in village meetings or assemblies. Further analysis revealed that there was no statistically significant difference between men and women regarding

participation in the village ($\chi^2 = .012$, $df = 1$, $p > .05$). This implies that both genders are actively participating in the village meeting. In most cases, however, women are involved but their voices have no power to influence decision-making. However, the chi-square test had limitations because the distribution of respondents was more skewed in the sense that there were more men than women.

The findings of this study seem to be similar to the observations by the study done by Nkedianye (2010) in the

pastoralist community in northern Kenya. Her study found that despite increased women's participation in formal decision-making but it did not produce better outcomes. Hence, the meaningful participation of women in decision-making and political process can only occur if they have the power to influence the decision-making process. Also, if their interests are incorporated.

Table 6: Logit Estimation on Factors Influencing Decision Making

Predictor variables	B	S.E.	Wald	Exp(B)
Education			.958	
Primary Education	.923	.944	.958	2.518
Secondary Education	18.969	11602.711	.000	173086590.305
Tertiary Education	18.969	14210.361	.000	173086590.305
Constant	2.234	.607	13.518	9.333

*** Significant at 5%

4.5 Influence of Education on Livelihood portfolios

Table 7 shows the results of logistic regression. Both primary education and age were significant predictors of transient poverty ($p < 0.05$) but the household size was not a significant variable in the model. The model explains about 30% (Nagelkerke R^2) of the variance in the response variable, this indicates the model provides a fairly fit to the data. The model correctly classified 73.8% of all cases. However, dummy variables for other levels of education (secondary and tertiary) were not included in the model because they were not statistically significant. This could have been caused by a small number of respondents who possessed such qualifications. Then, a dummy for primary education was retained in the model because of its statistical significance. Hence, the odds of household heads possessing primary education to have multiple livelihoods increases by a factor of 8.57 as compared to those who had never been to school while controlling for other variables (age of household head and household size). This implies that the education profile is statistically associated with several livelihood portfolios of the household head. The plausible reason could be that education provides skills and knowledge that enable people to easily participate in multiple income-generating activities.

The results from this study seem to agree with previous studies on a similar subject. The study done by Nkedianye (2010) found that as the education level of the household head increases also the chance of having multiple livelihoods increases. In another study by Nkedianye *et al.* (2020), it was found that livelihood diversification was related to the education level of household heads in the pastoralist communities in part of Kenya and northern Tanzania. In general, pastoralist households in the study area have



diversified their livelihood strategies to survive, build resilience to natural shocks and increase their asset base.

Table 7: Logit Estimation on Factors Influencing Livelihood Portfolio

Predictor variables	B	S.E.	Wald	Exp(B)
Primary Education(1)	2.149	.589	13.314***	8.572
Age	-.063	.031	4.016***	.939
Household Size	-.033	.119	.078	.967
Constant	2.610	1.787	2.133	13.594

*** Significant at 5%

The reference category in the dependent variable is never been to school

4.6 The Influence of Herd Size and Livelihood Portfolio on the Frequency of Transient Poverty

Table 8 shows the results of logistic regression. Both herd size and livelihood portfolio were significant predictors of transient poverty ($p < .05$). The model explains about 55% (Nagelkerke R^2) of the variance in the response variable, this indicates the model provides a fairly good fit to the data. The model correctly classified 87% of all cases. According to the model coefficients, the odds of a household experiencing consistently transient poverty declines by 1% when the herd size increases. Similarly, the odds of a household experiencing consistently transient poverty declines by 70.5% when household heads have multiple livelihood strategies. The effect of herd size seems to be very small possibly because Maasai people don't prefer to sell their cattle unless they want to cover an important expenditure such as paying for school fees. In this discourse, people may be in consistently transient poverty regardless of the asset accumulation (such as livestock). Hence, based on model coefficients households that possess large herd sizes and multiple livelihood portfolios are less likely to be trapped in consistently transient poverty. Even when controlling for other predictor variables (such as socio-demographic variables such as age and household size) in the model, still the predictor variables remain statistically significant.

The results from this study seem to be consistent with previous studies on similar subjects. In a study done by Tiampati (2015), it was found that herd size significantly influences the occurrence of transient poverty. They found that households that possess small herd sizes were more likely to be poor than their counterparts who possess large herd sizes. In yet another study, it showed that households with multiple livelihoods are likely to experience a low level of poverty (Reid *et al.*, 2014). In another study done by BurnSilver (2009), it was found that multiple livelihoods tend to increase the likelihood of rural households to grow

economically and result in to increase in household income. In another study by Nkedianye (2019), it was found that households with large herd sizes are likely to have multiple livelihoods such as farming and non-farming activities. In so doing, households can increase their income and reduce the poverty level. In addition, multiple livelihood portfolios might help to increase household resilience to natural shocks such as drought (Sachedina, 2008; BurnSilver, 2009; Galvin, 2009). This happens because households that depend on a single livelihood tend to have limited resilience and adaptive capacity to natural shock. In the occurrence of shocks, they are more likely to be negatively impacted and this could increase poverty and deprivation. However, increasing herd size should go along with the land carrying capacity. If that is not guaranteed, it might lead to adverse impacts on the ecosystem and socio-economic conditions of the people. In general, households can escape the consistently transient poverty trap if they engage in multiple livelihoods which are sustainable and resilient to shocks. Also, a large herd size should go along with increasing livestock productivity to reduce consistently transient poverty.

Table 8: Logit Estimation on Factors Influencing Transient Poverty

Predictor Variables	B	S.E.	Wald	Exp(B)
Livelihood Portfolio	-1.220	.358	11.613***	.295
Herd Size (cattle)	-.010	.002	16.471***	.990
Age	-.044	.032	1.962	.957
Household Size	.169	.139	1.483	1.184
Constant	4.902	2.203	4.950***	134.612

*** Significant at 5%

4.7 The Influence of Distance to the Water-Source, Pasture Fields and Nearest Markets on the Frequency of Transient Poverty

Table 9 shows the result of the logistic model. The predictor variables (distance to water sources, pasture field and nearest market) were statistically significant ($p < .05$). The model explains 88% (Nagelkerke R^2) in the variance of the response variable; this indicates the model provides a good fit to the data. The model correctly classified 97% of all cases. According to model coefficients, the odds of a household experiencing consistently transient poverty increases by 55.9% as the distance to the pasture field increases. The odds ratio of a household experiencing consistently transient poverty increases by 67.9% as the distance to the nearest market increases. The odds ratio of a household experiencing consistently transient poverty increases by a factor of 88.1% as the distance to the nearest water source increases. Even when controlling for other



predictor variables (such as socio-demographic variables such as age and household size) in the model, still the predictor variables remain statistically significant. The effects of distance to pasture, market and water sources seem to be high and this signifies the importance of these geographical factors in promoting the increase of consistently transient poverty at the household level. Hence, households located distant from these services and resources have more disadvantages because of the increased transaction cost such as transport costs. In return, their likelihood of transient poverty tends to increase.

The results of this study seem to be consistent with previous studies on similar subjects. The study done by Elhadi *et al.* (2015) found that distance to the market positively correlates to the incidence of transient poverty. This implies that the increase in distance to nearby markets increases the likelihood of transient poverty in a household. However, their study did not include other proximity measures such as distance to the nearby water sources. In another study done by Adunga (2013), it was found that increased distance to the market reduces household income. This implies that poor households are likely to be located a long distance from market centres. In general, the majority of previous studies mainly looked at how proximity to the market centres causes poverty in the households but they did not include proximity to other impact resources or services in the pastoralist communities. In this study, proximity to water sources and pasture fields were also included in the model and they proved to have a significant effect on explaining the poverty of the households. Therefore, poor households cannot escape the consistently transient poverty trap if they continue to have limited physical access to the market, water sources and pastures field.

Table 9: Logit Estimation on Factors Influencing Transient Poverty

Predictor variables	B	S.E.	Wald	Exp(B)
Distance to pasture field	.444	.160	7.716***	1.559
Distance to Nearest water source	.632	.258	5.991***	1.881
Distance to Nearest market	.518	.240	4.663***	1.679
Age	-.035	.059	.356	.965
Household Size	-.042	.263	.026	.958
Constant	-	4.578	6.321***	.000
	11.508			

*** Significant at 5%

4.8 Livelihood Portfolio among the Pastoralist Households

Figure 4 shows the livelihood portfolio of the respondents in the study area. As shown in the figure, the vast majority of respondents (100%) earn income through the sale of livestock and followed by 85% who earn income through the sale of animal products such as milk. Less than half of respondents (50%) said to earn income from small business,

farming and casual labour. More than three-quarters (94%) of the respondent had more than one livelihood strategy. Specifically, the majority of respondents (43%) had two livelihood strategies and followed by 38% who had three livelihood strategies. A few very respondents (2%) had five livelihood strategies. Although respondents were involved in multiple livelihood strategies still they had to raise livestock because it is part of their culture. Farming was not much practised in the area because the land is not very suitable for intensive farming. The only farming which is being practised is subsistence farming to supply food to the household. In the interview with a key informant (agricultural officer), it was revealed that the soil depth is very shallow and hence it cannot handle intensive farming or large-scale farming. In contrast, it was surprising to observe large cultivation taking place as shown in Figure 5 Majority of these fields were to be operated by outsiders according to the key informant. On one occasion, members of the focus group claimed that politicians have promoted intensive farming although they know the area is not suitable for such practice.

“There is competition for succession between invasive and native species in this ecosystem. Livestock and wild animals are suffering a lot because invasive species are replacing native species (source of animal feeds). I believe this is happening due to ongoing agricultural practices in the areas. I worry about the future of this ecosystem is the situation will continue to manifest”
(Extension officer)

The above claim by the extension officer shows that invasive species have become a serious problem in the Simanjiro plains. This poses a big threat to the sustainability of the ecosystem and people's livelihoods. In addition, the area is also known to be a breeding site for wildlife such as Wildebeest and Zebra which seasonally migrate from Tarangire National Park to Simanjiro plains. Any change which brings adverse impacts to ecological conditions in this area will also have significant negative impacts on the wildlife in the Tarangire National Park because of the interaction between these two locations.

The results from this study seem to concur with previous studies on similar subjects. The study done by Nkedianye *et al.* (2020) found that the Maasai community in Simanjiro have multiple livelihood strategies including quarry business and mining. In another study by Reid *et al.* (2014), it was found that Fulani pastoralists in Nigeria had multiple livelihood portfolios including farming and non-farming activities. In yet another study, it was found that the pastoralist community in southern Ethiopia had diverse livelihoods including farming, petty trade and handcrafts (Nkedianye, 2010). They also found that the education of household heads, herd size, family size, and distance to the market were significant determinants of livelihood diversification. In another study done by Galvin (2009), it was found that age, herd size, level of credit access and use, market access, and remittance influenced the pastoralist



household's decision to diversify their income. Similar determinants could also apply to the study area because of similar socio-economic characteristics among the pastoralist communities. Furthermore, studies done by Sachedina (2008), BurnSilver (2009) and Galvin (2009) showed that income increase is positively correlated to livelihood diversification. In contrast, the study done by Little *et al.* (2008) found that livelihood diversification did not significantly improve the welfare (including poverty reduction) of pastoralists in Xinjiang, China. This could be attributed to the difference in socio-economic conditions. In general, pastoralist households in the study area have diversified their livelihood like other pastoralist communities. Yet, livestock keeping continues to be a major source of income. However, in the current conditions in which there is climate change and rapid population growth, the pastoral production system need to be more resilient and productive.

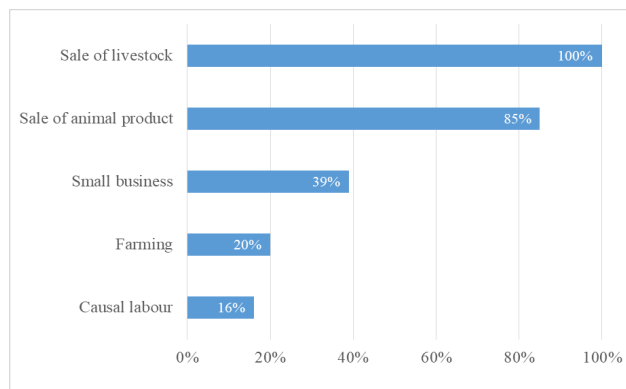


Figure 2: Livelihood Portfolios

Table 10: Number of Livelihood Portfolio

Livelihood portfolio	Frequency	Percent (%)
1	6	6
2	43	43
3	38	38
4	11	11
5	2	2.0
Total	100	100

Furthermore, drivers that influence livelihood portfolios were also explored. The results (table 11) of binary regression show that age and primary education dummy were statistically significant to the model ($P < 0.05$). The model explains 43% (Nagelkerke R^2) in the variance of the response variable; this indicates the model provides a good fit to the data. The model correctly classified 79% of all cases. However, the dummy variable for secondary and tertiary education, household size and sex were not found to be significant to the model ($P > 0.05$). The results indicate that the odds of household head engaging in multiple livelihood strategies decrease by 6.3% for an additional increase in the age of the household head while holding other factors constant. This is possible because as people get older,

they become less energetic and hence reduce their chance to have multiple livelihood strategies. On the other hand, the odds of household head engaging in multiple livelihood strategies increases by a factor of 7.09 for a household head who possesses primary education as compared to their counterparts. The effect of education in the model could be explained by the distribution of the data.

Table 11: Logit Estimation on Factors Influencing Engagement in Multiple Livelihood Strategies

Predictor Variables	B	S.E.	Wald	Exp(B)
Age	-.065	.033	3.879***	.937
Sex (Female)	-.347	.656	.280	.707
Household size	-.009	.126	.005	.991
Herd size	.003	.002	2.555	1.003
Primary Education(Ye s)	1.959	.609	10.332**	7.092
Secondary Education(Ye s)	22.041	11107.996	.000	3734413146.478
Tertiary Education (Yes)	21.871	13301.961	.000	3150292408.596
Constant	2.000	1.916	1.090	7.387

*** Significant at 5%

5.0 CONCLUSION AND RECOMMENDATIONS

Based on the findings of this study the following conclusions are made. First, there is limited access to education, in particular, secondary and tertiary education because the majority of the household heads had a primary education level. With limited access to higher education, more people are likely to be trapped in consistently transient poverty. Also, the education level of household heads has shown a significant effect on several livelihood strategies as well as the transient poverty. Thus, transient poverty reduction cannot be achieved if the population continue to have limited access to higher education.

Second, the herd size showed a significant effect on transient poverty. The more the herd size the less the likelihood of household head being trapped in consistently transient poverty holding other factors constant. Also, geographical proximity (such as distance to the nearest market, water sources and pasture fields) had a significant effect on transient poverty. The more the distance to the nearest market, water sources and pasture fields the higher the likelihood of household heads to trap in consistently transient poverty holding other factors constant. Thus, the consistently transient poverty status of a household is highly associated with the level of physical access to the nearby market, water sources and pasture fields.

Lastly, the household heads in the Simanjiro area have multiple livelihood portfolios. This indicates that households have diverse livelihood strategies as other pastoralist communities in other places. The majority of household



heads had two to three livelihood strategies. Despite the household, heads have multiple livelihoods but still, they continue to raise livestock. Thus, for the pastoralist households to escape the consistently transient poverty trap and improve their well-being they need to diversify their livelihood strategies because it helps to increase income and enhance resilience.

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