

# **Pottery and Poverty Reduction among Kisi Households in Ludewa District, Tanzania**

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## **Abstract**

The study investigated the impact of pottery trade in reducing poverty among the Kisi households in Ludewa district which is located very close to Lake Nyasa..The role of pottery industry in breaking the vicious cycle of poverty among the Kisi began during the Iron Age in the first millennium A.D. The Kisi people live in Ludewa District and a few have spread to neighbouring districts like Kyela and Mbinga. The main economic activity of the Kisi is fishing but after trade liberation in the 1980s fishing is overtaken by pottery industry. The data for calculation of poverty index was collected from three villages which are Lumbila, Nkanda and Nsele which had abundant raw materials for pottery making along Lake Nyasa. The calculation of various indicators of poverty and their relationship to pottery industry indicated that pottery has a reasonable impact on poverty alleviation among the Kisi in Ludewa District. This is verified by the improvement of housing whereby people involved in pottery industry had slightly better housing than others. The same was applied to income poverty where villages like Lumbila and Nkanda had a higher per capita income when compared to Nsele Village which depends more on crop marketing than pottery. As far as household asset ownership is concerned there were small differentials among the villages and this was also reflected on the utilization of improved power, health and sanitation. The main bottleneck in the alleviation of poverty among the Kisi people was lack of reliable inland transport which was hindered by steep slopes close to the Lake and unreliable motorboats which ply along the lake. Some villages like Lumbila have managed to purchase a boat but in the case of Nkanda due to management problems the boat has been abandoned. The overall indicator shows that Lumbila village with more diversified economy had higher per capita income than the other villages. Besides this the villages were vulnerable to environmental degradation and disasters related to health.

## **Introduction**

This study investigates the impact of pottery trade in reducing poverty among the Kisi households in Ludewa district which is among the periphery districts in Tanzania (Mbonile 1995). Historically pottery making among the Kisi began during the Iron Age in the first millennium A.D (Waane 1979: 61-63). Nonetheless their popularity as pottery makers began in the 18<sup>th</sup> century

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when they bartered or marketed pottery in the whole of Southern Highlands and in East and Central Africa (Mbonile 1994, 1996, 2008). Later it spread to other continents like Europe in the 19th century as reported by Thomson in 1881. Another phase of evolution of pottery making began in the 1980s due to The Structural Adjustment Programmes which led to trade liberalization which speeded up the commercialization of pottery leading to the formation of major pottery enterprises which buy pottery in large quantities and transport it to other parts of the country and abroad. This change was propelled by the improvement of Lake Nyasa transport system whereby fast moving steamers opened up the pottery market to the rest of the country and neighbouring countries like Malawi (Maliyamkono & Bagachwa 1990; Mihanjo 2003; Ludewa District Report 2007, 2017). The major impact of commercialization of pottery is the increase in pottery production which almost tripled from 6,000 to more than 20,000 pots per week in 2017 which are locally and nationally sold in most weekly markets such as Matema (Kyela district) and in large urban centres markets like those in Mwanjelwa in Mbeya City (Mbonile 2005; Ludewa Annual District Report 2017).

Besides an increase in the number of pottery products there was a diversification of pottery by introducing new varieties of pottery such as *sufuria (CCM)*, *birika* and *Vya mapambo* which are very popular and have a big market in urban areas and abroad. These supplement the old varieties of pots such as *tukalango*, *indeku sya misi*, *masyala*, *mafuniko* and *ndebele* which are largely used for cooking and storage of water. Other types of pots include *ingumbe* and *finjoli* which are used for grain storage and so are more marketed locally. The change in the type of pots has led to a change in pottery labour relations whereby most pots are made by girls who are more familiar and knowledgeable in making small types of pots which are more popular in urban areas. On the other hand, men are more involved in fetching firewood for burning pots and transporting pots to the shore ready for marketing either as casual labourers of women or as traders themselves (Gulliver 1955; Mihanjo 2003; Ludewa District Report 2007). As a whole the marketing of pottery occurs by stages from the village to large urban centres. Usually at the village or ward level the pottery producers sell the pots to local vendors at lower price relative to trading centres and large urban centres like Dar es Salaam City. In big trading centres like Mbeya the pots are collected by long distance Kisi traders and others who have a wide network of communication and marketing systems by using internet and other means of communication such as mobile phones (Ellis 1998; Ellis & Harris 2004; Mihanjo 2003; Ludewa Annual District Report 2017).

Nonetheless, despite the changes in the marketing system of pottery the industry is still a household or grass root industry leading to the per capita income of areas involved in pottery industry being about Tshs 250,000/= which is less than the national per capita income of Tshs 350,000/=. It is largely produced by Kisi households in villages like Nkanda, Lumbila and Nsele where there is a concentration of clay soil for pottery making. Since these villages are almost semi-landlocked by the Livingstone Mountains and Lake Nyasa the collection of clay, softening of clay with water, making the pots, drying the pots and baking the pottery is exclusively done at household level. They only import smoothening clay from Makete district which has a strong historical link in trading Kisi pottery (Ludewa District Report 2017). The reason why pottery making is exclusively a household activity is based on the way the transmission of pot making skills is conducted. This is done within the household and family context and hence it does not allow much room for other people to acquire this knowledge without an agreement with the households involved in pottery making (Mihanjo 2003).

Among the major outcomes of these changes in the pottery marketing systems is the change in gender roles in pottery making and slight breaking the vicious cycle of poverty (Nindi 2007; Mteti 2016). The improvement in income generated from pottery and the decline in fishing activities which were predominantly male due to ecological changes in the ecosystem of the lake caused by environmental degradation in the catchment area, has compelled some males to invade the pottery industry. (SADC/GEF Report 2007; Mihanjo 2011). Nonetheless, despite this change in gender roles in the pottery industry, males still maintain their migratory fishing attitudes along the lake which endanger the health of the people through diseases like HIV/AIDS which in turn reverse the effort of breaking the vicious cycle of poverty (Waane 1979; Mihanjo 2003, 2011; Chuwa 2010). As a whole for several centuries the Kisi have been engaged in pottery industry but it is only recently that they have seriously embarked in the commercialization of pottery that gives them more prospects for the Kisi to break the vicious cycle of poverty. It is essential to investigate the commercialization of pottery because this change has led to a change in the household livelihood socially and economically leading to more positive impact in the Kisi struggle in breaking the vicious cycle of poverty.

### **Theoretical background to the study**

#### ***Attempts to Break the Vicious Cycle of Poverty in Other Parts of the World***

The attempt to use traditional pottery industry in breaking the vicious cycle of poverty is not exclusive to the Kisi communities only. For example, as the

agricultural and fishing activities stagnated in the Indian villages of Jaipur local communities resorted to the production of blue pottery which had a big demand in urban areas and were exported to industrialized countries like Western Europe (Bhatnagar & Rai 2006). Almost the same process occurred in Sindh Pakistan where cottage industries producing high quality pottery managed to alleviate poverty of the people and raised their standard of living to high levels (DAWN Group Newspapers, 2002). In Tanzania other pottery makers with similar ambitions of revolutionizing the marketing systems are concentrated in the Southern Coast in Lindi Region and in Pare and Usambara Mountains in the north (Mbonile 1994; Chami 2001; Namsifuel 2007; Mteti 2016).

Almost the same process was experienced among the Kinga communities of Makete district who broke the vicious cycle of poverty by marketing Kisi pottery and locally made bamboo goods which dominated the commercial services in several commercial cities like Dar es Salaam (Mbonile 1996:102; Mbonile 2008). Besides this other areas in the country have attempted to break the vicious cycle of poverty by utilizing water reeds in making baskets as in the case of Njombe district (Mung'ong'o 1998) and baobab seeds in the central semi-arid areas like Dodoma and Singida regions (SUA 2006; Mbonile 2005)

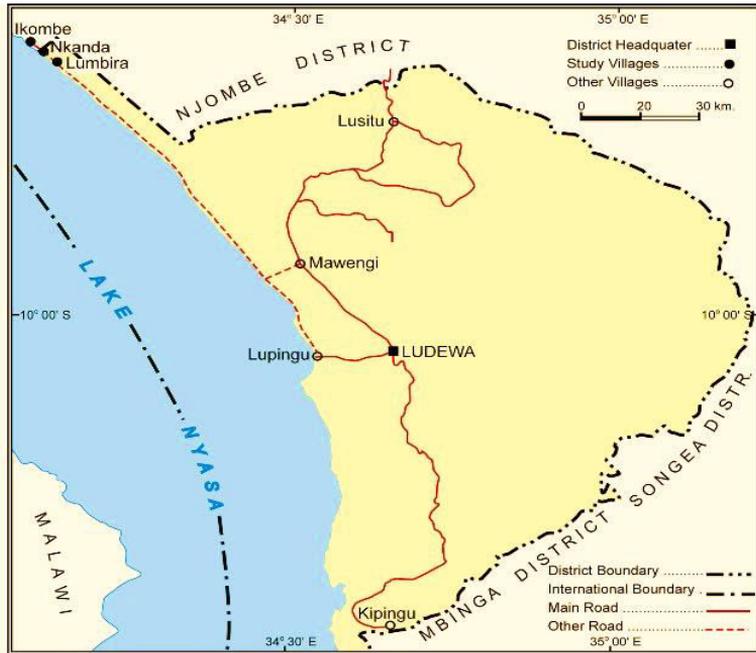
### ***Grass Root Alleviation of Poverty***

The alleviation of poverty at grass root level has been the basic aim of most traditional societies like those of the Kisi in Tanzania and Jaipur in India. As labour reserves for the most developed parts of the respective countries, they have been supplying labour and industrial raw materials. Despite their huge effort to supply labour and the production of pottery for subsistence needs they remained in abject poverty and social deprivation. The change in development strategies in the last 20 years by increasing the commercialization of their traditional products guaranteed these societies the means of getting money for development and hence raising the chance of breaking the vicious cycle of poverty among households (Omary 1975; Mihanjo 2003; Bhatnagar & Rai 2006; Mbonile & Haule 2011).

### **Research Methodology**

The Kisi people live in Ludewa District and a few have spread to neighbouring districts like Kyela and Mbinga. They live in villages which started as fishing settlements and they are organized along the clan system; and their two main activities are fishing and pottery making which has popularized the Kisi all the world by being marketed in several

countries as ornaments and cooking pots. All along, agriculture among the Kisi has been to a large extent a peripheral activity because they could barter fish with cereals like maize from neighbouring tribes like the Kinga, Pangwa and Nyakyusa (Berry 1971; Mihanjo 2003) (See Map 1).



**Map 1: Map of the study Area**

In 2012 the population in sampled wards involved in making pottery was about 1,880 and projected to about 2,444 in 2017.. The total number of households in 2012 was about 990 (URT 2012; Ludewa District Report 2017).The study employed quantitative data collection method in getting primary data by using a structured questionnaire while focus group discussions were used to collect qualitative data. The sampling unit was the household and since the study area was estimated to have about 990 households a total of 248 households was randomly selected after listing the heads of households in each village. To assess the impact of pottery in breaking the vicious cycle of poverty, the households randomly selected included those involved in pottery industry as core group and those involved in other activities as a control group.(Babbie, 2001). The data was analysed by using both quantitative and qualitative techniques The data obtained from the structured questionnaire was entered, cleaned and analyzed by using the IBM Statistical Package for Social Science (SPSS).

### ***The Methods of Mapping Poverty or Wealth Index***

The calculation of index of poverty the study used income measures or consumption expenditures which measured indicators of household economic status such as the quality of buildings (roofing materials, walls and floors), consumable durables (cloth iron, type of beds, spongy mattresses and watches) and communication means such as radios and smart phones. It also included the status of health such as morbidity, access to education and markets. The ownership these properties asset took the value of one if it was owned by the household and zero when there was nothing as suggested by Davis (2003).. The final wealth index or asset index ( $A_j0$ ) was calculated based on the following formula:

$$A_j0 = f1 (f_{j1} - a1) / (S1) + \dots + fN (a_{jN} - a_{jN}) / (SN) \quad (1)$$

Where  $A_j0$  = Index for each household;  $f$  = is the scoring factor for the first asset as determined by the procedure;  $A_{j1}$  = the  $j$ th household value of the first variable (one or zero) and  $a1$  and  $S1$  are the mean and standard deviation respectively of the value on the asset variable over all household;;  $N$  = Total number of households;;  $n$  = Sampled number of households

In the study the poverty or wealth indicators were calculated based on the frequencies which was regressed item by item in the formula and later for easy interpretation they were standardized by multiplying each index by 100. The indexes were then reclassified in three broad categories of development as follows:

- Category 1: 80-100 (High Poverty Index)
- Category 2: 60-79 (Medium Poverty Index)
- Category 3: 40-59 (Moderately Low Poverty Index)
- Category 4: 0-39 (Low Poverty)

In order to calculate the wealth or poverty index different scores were allocated according to the number of assets and amenities possessed by various households. These indicators included income, education, occupation, type of water supply, sanitation, housing conditions, vulnerability to diseases and disasters, household assets, source of lighting and cooking power supply, source of and ownership of land (Babbie 2001; Mbonile et al., 2017). After calculating the poverty or wealth index graphs were drawn based on villages involved in pottery industry. During the survey coordinates of village boundaries were taken by using GPS.

### Economic Activities of the study area

The main economic activities of the study area included farming, fishing, pottery making and petty business. However, some of these activities such as pottery making and fishing follow gender mainstreaming whereby fishing was exclusive for males while pottery making was for females. Other activities which were on the rise were petty business within Lake Nyasa shores and elsewhere in the country. A critical analysis of these activities in breaking the vicious cycle of poverty showed that farming had a narrow chance because most of the cultivation is done in steep slopes and narrow inlets which gave no room for mechanization and intensification of agriculture. Besides this agriculture has low productivity because no inputs like fertilizers had been applied to enrich the soil due to having few livestock except a few pigs and chickens. On the other hand, fishing which has been practiced for centuries was largely for subsistence and the salinization of the lake endangers some of the popular species in the lake such as *mbasa*, *mbelele* and *dagaa*. Above all in recent years there is a heavy competition between subsistence fishing and commercial fishing which buys most of the popular species for marketing to big centres like Dar es Salaam. Besides this there was very low diversification to non-agrarian activities except for a few women who brew local beer, small shops and tailoring marts (See Table 1 and Plates 1-3)

**Table 1: Study Population by Economic Activities and by Villages**

Economic Activities	Lumbila		Nkanda		Nsele		TOTAL	
	M	F	M	F	M	F	M	F
Farming	34.9	17.2	20.9	28.7	45.1	70.7	35.1	37.7
Pottery making	0	64.2	0	59.0	0	15.5	0	47.3
Fishing	54.3	0	74.6	0	51.6	0	59.5	0.0
Petty Business	6.0	13.8	3.0	8.2	2.2	8.1	2.9	10.2
Employed	4.8	4.8	1.5	4.1	1.1	5.7	2.5	4.8
<b>TOTAL</b>	<b>83</b>	<b>145</b>	<b>67</b>	<b>122</b>	<b>91</b>	<b>123</b>	<b>239</b>	<b>390</b>



**Plate 1: Cultivation on Steep Slopes in Lumbila and Poor Banana Plantation in Nsele Village**



**Plate 2: A Catch of Dagaa Ready for Local Marketing in Nsele Village and drying Maize for Making Local Beer in Nkanda Village**



**Plate 3: Selling Local Beer at Lumbila Village and Drying Dagaa Ready for Marketing at Nsele Village**

### **Pottery Making in Ludewa District**

Pottery is a ceramic ware made by potters and the place where such wares are made is also called pottery. Besides this pottery is made by forming a clay body into objects of a required shape and heating them to high temperatures in a kiln to induce reactions that lead to permanent changes which include increasing their strength and hardening and improves their shape (Disdale 1986). Moreover, there are variations in the properties of raw materials used for the production of pottery and this leads to wares that are unique in character to a locality like the Kisi area (Mihanjo, 2003; Mteti 2016).

The study revealed that among the Kisi it is common for clays and other materials to be mixed to produce clay bodies suited to specific purposes such as clay making thermos flasks, clay irons for ironing clothes and decorated pots (See Plates 4-6). Above all it was confirmed that pottery industry among the Kisi is solely a female activity which is transferred from mothers to daughters.

It is only on rare occasions when males are involved in transporting pottery to the market under a close supervision of women. Another advantage of Kisi pottery industry is that most raw materials are obtained in the vicinity of villages which include grey and white clay. This is due to the fact that when the rift valley was formed to create the Livingstone Mountain Ranges and Lake Nyasa clay seams were exposed on the steep slopes of the rift valley. Usually every village or household has a place where it can dig both grey and white clay. After the clay soil has been dug it is brought at a shed near the household by head or canoes for distant villages like Nsele. On the other hand, red oak which is used for decorating the pots is imported from Makete District which borders Ludewa District (See Table 2 & Plate 4)



**Plate 4: Clay Thermos Flask, Decorated Pottery and clothes Iron Pottery Products at Matema**

As observed by Mihanjo (2003) and Mteti (2016) Kisi pottery making industry in the past was basically geared in producing pottery for domestic use. Nonetheless, recently pottery making industry has been revolutionalized to serve the market (90%) which goes beyond the borders of Ludewa District.

These changes have made the industry to produce a variety of commodities including thermos flasks and iron for clothes. This change has made both local and international vendors to purchase most pottery and market them in large towns like Mbeya and Dar es Salaam as well as abroad. Nonetheless, the various market bottlenecks such as high transport cost along the lake and inland the overall per capita income per month earned from pottery industry ranged between Tshs 11,000 (Tshs 132,00 per annum) in Nsele Village to Tshs 29,330/= (Tshs 348,000 per annum) in Lumbila Village which is relatively very small in breaking the vicious cycle of poverty among Kisi people. Moreover, most of the money earned in pottery is used for buying food and paying social services like school fees instead of accumulating wealth like building better houses. Above all the industry is facing a lot of risks which include poor prices especially at local markets where a medium pot was sold at Tshs 100/= but when it reaches Matema market (*luilo*)

**Table 2: People Engaged in Pottery Making, Source of Expertise, Type and Source of Raw Materials in the Study Villages**

People in Pottery	VILLAGES			TOTAL
	Lumbila	Nkanda	Nsele	
Mothers	96.7	98.4	96.9	<b>97.8</b>
Girl Child	3.3	1.6	3.1	<b>2.2</b>
<b>N</b>	<b>90</b>	<b>67</b>	<b>86</b>	<b>243</b>
<b>Source of Expertise</b>				
Inherited from parents	88.9	89.6	96.5	<b>91.7</b>
Trained by others	6.7	3.0	2.3	<b>4.1</b>
Own initiative	3.3	4.5	0.0	<b>2.5</b>
School	1.1	3.0	1.2	<b>1.7</b>
<b>N</b>	<b>90</b>	<b>67</b>	<b>86</b>	<b>243</b>
<b>Type of Raw Materials Used</b>				
Clay soil	95.6	97.0	96.5	<b>96.3</b>
Red soils	4.4	3.0	3.5	<b>3.5</b>
<b>N</b>	<b>90</b>	<b>67</b>	<b>86</b>	<b>243</b>
<b>Source of Raw Materials for Pottery</b>				
Within the village	97.8	92.5	5.8	<b>63.8</b>
Neighbouring villages	2.2	7.5	74.4	<b>29.2</b>
Other wards	0.0	0.0	19.8	<b>7.0</b>
<b>N</b>	<b>90</b>	<b>67</b>	<b>86</b>	<b>243</b>

<b>Distance to Source of Clay Soil (kms)</b>				
1-2	28.9	4.5	1.2	12.3
3-4	60.0	82.1	3.5	46.1
5+	11.1	13.4	95.3	41.6
<b>N</b>	<b>90</b>	<b>67</b>	<b>86</b>	<b>243</b>
<b>Carrying of Raw Materials</b>				
By head	100.0	100.0	1.2	<b>65.0</b>
Canoes	0.0	0.0	98.8	<b>35.0</b>
<b>N</b>	<b>90</b>	<b>67</b>	<b>86</b>	<b>243</b>
<b>Source of energy for pottery making</b>				
Firewood/grass	85.0	87.0	81.0	<b>84.0</b>
Solar	15.0	13.0	19.0	<b>16.0</b>
<b>N</b>	<b>90</b>	<b>67</b>	<b>86</b>	<b>243</b>

it rises to Tshs 500/=. The same pot when it reaches big markets like those of Mbeya City and Tunduma it is sold at Tshs 6,500/= while in Dar es Salaam it is sold at Tshs 10,000. Hence in order to get a big margins of profit both the producer and vendor have to carry large numbers of pottery which in turn increase the risk of pottery breaking down. Other risks include the risks of exhaustion of energy materials for baking pottery and competition of other potters like those of Pare in Kilimanjaro region (See Table 3 & Plates 5-7).

**Table 3: Marketing of Pottery and Risks of Pottery Industry**

<b>Purpose of Pottery Making</b>	<b>VILLAGES</b>			<b>TOTAL</b>
	<b>Lumbila</b>	<b>Nkanda</b>	<b>Nsele</b>	
Domestic Use	4.4	3.0	12.8	<b>7.0</b>
Marketing	95.6	97.0	87.2	<b>93.0</b>
<b>N</b>	<b>90</b>	<b>67</b>	<b>86</b>	<b>243</b>
<b>Place of marketing pottery</b>				
Local markets	93.3	89.6	97.7	<b>93.8</b>
Abroad	6.7	10.4	2.3	<b>6.2</b>
<b>N</b>	<b>90</b>	<b>67</b>	<b>86</b>	<b>243</b>
<b>Purchase of Pottery</b>				
Local people	1.1	3.0	3.5	<b>2.5</b>
Market vendors	98.9	97.0	96.5	<b>97.5</b>
<b>N</b>	<b>90</b>	<b>67</b>	<b>86</b>	<b>243</b>
<b>Income from pottery (Tshs)</b>				
0-20,000	44.4	37.2	93.0	<b>59.7</b>
21,000-40,000	31.1	29.9	4.7	<b>21.4</b>

Purpose of Pottery Making	VILLAGES			TOTAL
	Lumbila	Nkanda	Nsele	
41,000-60,000	6.7	29.9	2.3	<b>1.5</b>
61,000-80,000	17.8	1.5	0.0	<b>0.8</b>
81,000-100,000	0.0	1.5	0.0	<b>0.4</b>
1001,000+	0.0	0.0	0.0	<b>0.0</b>
Per capita Income (Tshs)	29,330	13,050	11,308	<b>17,903</b>
N	<b>90</b>	<b>67</b>	<b>86</b>	<b>243</b>
<b>Assets and consumers bought by pottery income</b>				
Built house	16.7	22.4	14.0	17.3
Paying school fees	36.7	14.9	11.6	21.8
Purchase fishing gear	0.0	0.0	2.3	0.8
Purchase food	46.6	62.7	72.1	60.1
N	<b>90</b>	<b>67</b>	<b>86</b>	<b>243</b>
<b>Risks of pottery making industry</b>				
Exhaustion of raw materials	14.4	23.9	3.4	<b>13.2</b>
Exhaustion of energy materials	26.7	35.8	25.6	<b>28.8</b>
Competition from other potters	1.1	4.5	11.6	<b>5.8</b>
Competition from other activities	1.1	3.0	5.8	<b>3.3</b>
Poor price	53.4	29.8	50.1	<b>45.7</b>
Declining skills	1.1	1.5	2.3	<b>1.6</b>
Cracking of pottery	2.2	1.5	1.2	<b>1.6</b>
N	<b>90</b>	<b>67</b>	<b>86</b>	<b>243</b>



**Plate 5: Digging Clay Soil for Pottery in Lumbila Village and Drying Pottery at Nkanda Village**



**Plate 6: Pots and Small Plates at Lumbila Village and Transportation of Pottery at Lumbila Port**



**Plate 7 Marketing of Pottery at Matema Market and Pots and Sugar Containers at Kiwira Market**

When the marketing of pottery industry was further investigated it indicated that most customers prefer Kisi pottery because they are made with high skills which are quite unique to the Kisi people only. Others showed that the type of soil which is used in making pottery is good leading to strong pots despite the fact that most pots are very thin. There were few households which indicated that the pots are well decorated and so they are very attractive to the people. In addition, the regions which prefer Kisi pottery include neighbouring regions like Mbeya and Ruvuma who have been buying these pots for centuries and recently Dar es Salaam City has risen in importance in buying Kisi pottery because of marketing abroad and high demand as decorations in more affluent households like those of Oysterbay, Mbezi Beach and Masaki. The most popular market abroad is based in Malawi which lies on the other side of Lake Nyasa and acts as a distributor of pottery to Mozambique, Zimbabwe, South Africa and Namibia (See Table 4).

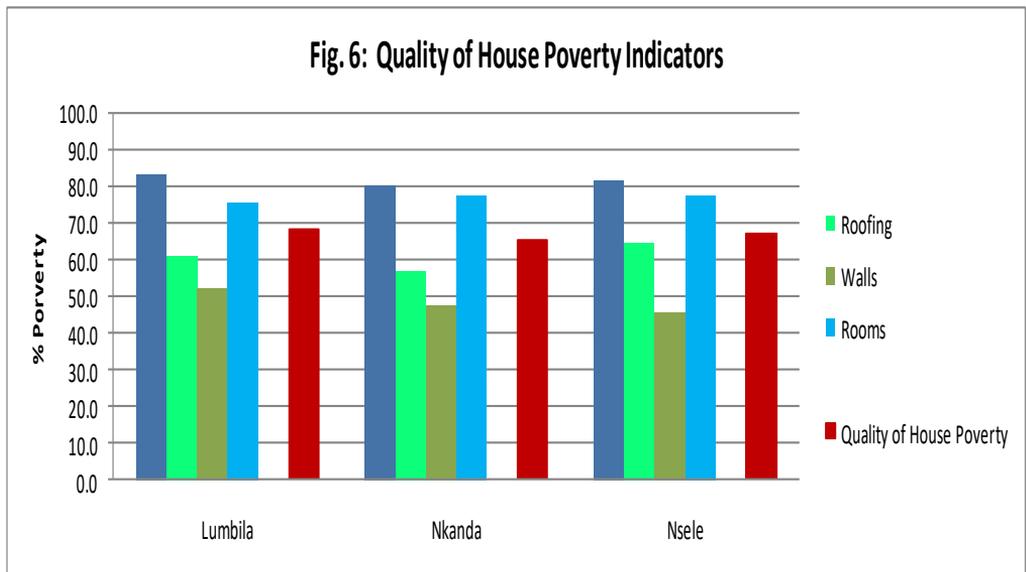
**Table 4: Preference and Marketing of Pottery in Study Villages**

Preference of Kisi Pottery	VILLAGES			TOTAL
	Lumbila	Nkanda	Nsele	
Made with high skills	42.2	50.9	66.3	<b>66.3</b>
Soil used is good	10.0	11.9	14.0	<b>14.0</b>
Strong	38.9	13.4	4.7	<b>4.7</b>
Good in cooking	6.7	19.4	14.0	<b>14.0</b>
Easy to transport	2.2	4.5	1.2	<b>1.2</b>
<b>N</b>	<b>90</b>	<b>67</b>	<b>86</b>	<b>243</b>
<b>Regions which prefer most Kisi pottery</b>				
Mbeya	12.2	9.0	1.2	<b>7.4</b>
Iringa	64.2	28.4	16.3	<b>31.3</b>
Dar es Salaam	38.9	61.2	81.3	<b>60.1</b>
Ruvuma	1.1	1.5	1.2	<b>1.2</b>
<b>N</b>	<b>90</b>	<b>67</b>	<b>86</b>	<b>243</b>
<b>Countries which prefer Kisi pottery</b>				
Malawi	94.5	86.6	52.3	<b>77.4</b>
Zambia	3.3	4.5	40.7	<b>16.8</b>
Abroad	2.2	8.9	7.0	<b>5.8</b>
<b>N</b>	<b>90</b>	<b>67</b>	<b>86</b>	<b>243</b>

## Poverty Indicators by Villages

### *Housing Conditions*

The main objective of the National Human Settlements Development Policy of 2000 was to provide adequate and affordable shelter and sustainable human settlements for all people in the country. Meanwhile shelter includes sanitation, drainage and other facilities like energy supply (URT 2006). As a whole the study revealed that the housing condition in the study villages was still poor because more than 80% of the floor materials were made of earth/sand. The same situation was almost reflected in roofing materials where more than 60% of the household's houses were roofed by grass and leaves. There is some improvement in wall materials where a reasonable proportion of houses were made of baked bricks. Moreover, almost the same worst scenario is observed in the number of rooms per household where about 52% of households had about 1 to 2 rooms per household. As in all rural societies 96% of households own their own houses despite the fact that there are of low quality (Plate 8). Hence these results indicate that pottery making has slightly liberated the people in these villages in terms of housing conditions. The poor housing condition were also reflected when the poverty indicators were calculated (See Fig. 6).



**Plate 8: A Poor House in Lumbila Village and a Modern House in Lumbila Village**

### ***Water Supply and Sanitation***

Water supply is the provision of water by public utilities, commercial and community organizations or by individuals usually by a system of pumps and pipes (World Bank 2006). In terms of water supply all households fetch water from the lake which is also the major area for bathing, washing clothes and watering livestock. Moreover, since all the villages lie along the shore of Lake Nyasa the time used to the main source of water ranges between 10 minutes to 30 minutes. The most common type of toilet is the pit latrine but there are still some households which use the lake and neighbours' toilets. Also, the most common waste disposal is the traditional pit and others just throw solid wastes

in the household compound or other places near the compound especially the lake which is hazardous to the health of the people (See Table 5).

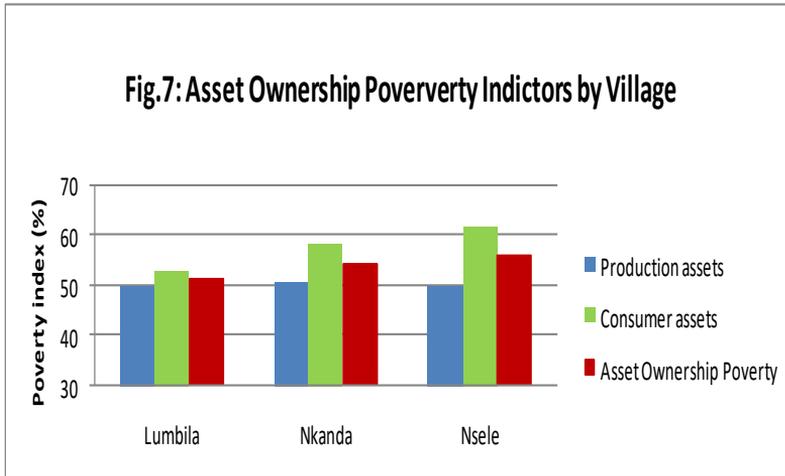
**Table 5: Distance to Water Supply, Type of Toilets and Waste Disposal**

Distance to Water supply	VILLAGES			TOTAL
	Lumbila	Nkanda	Nsele	
1-10 minutes	75.9	54.6	52.4	<b>61.6</b>
11-20 minutes	10.3	22.7	21.4	<b>17.7</b>
21-30 minutes	10.3	22.7	26.2	<b>19.4</b>
31+ minutes	3.5	0.0	0.0	<b>1.3</b>
<b>N</b>	<b>90</b>	<b>67</b>	<b>86</b>	<b>243</b>
<b>Type of Toilets</b>				
Pit toilet	100.0	83.6	98.8	<b>95.1</b>
Bush/lake	0.0	13.4	0.0	<b>3.7</b>
Neighbors toilet	0.0	3.0	1.2	1.2
<b>N</b>	<b>90</b>	<b>67</b>	<b>86</b>	<b>243</b>
<b>Type of Waste Disposal</b>				
Traditional pit	61.1	56.7	46.5	<b>54.7</b>
Household compound	36.7	38.8	52.3	<b>42.8</b>
Outside household	2.2	4.5	1.2	<b>2.5</b>
<b>N</b>	<b>90</b>	<b>67</b>	<b>86</b>	<b>243</b>

### Household Ownerships of Assets

Asset ownership is one of the major indicators of poverty in the society. Usually rich households own property wealth of several billions of money while poor households own simple tools used to sustain their livelihoods (Mbonile et al. 2016). The results in the study villages indicated that in economically better villages like Lumbila a large proportion of households owned canoes and fishnets which are basic instruments in subsistence fishing (See Plate 9). Besides this most households own radios which help them to communicate with the rest of the world. The other important consumer asset in the modern world is the mobile phone which despite the lack of electricity in most households they are charged in mission centres which have electricity or at Matema suburban area where there is electricity or generators. The calculation of asset poverty indicators showed significant differentials among the three villages which depended more on how they benefit from pottery industry. In terms of production asset ownership poverty indicator Lumbila and Nsele Villages were better off than Nkanda Village. When it comes to consumer asset ownership poverty indicator Lumbila Village was better off than Nkanda and Nsele

Villages. Hence the overall poverty indicator showed that Lumbila Village was a bit better than Nkanda and Nsele Villages which may be the result of leading in pottery production and marketing (See Fig. 7).

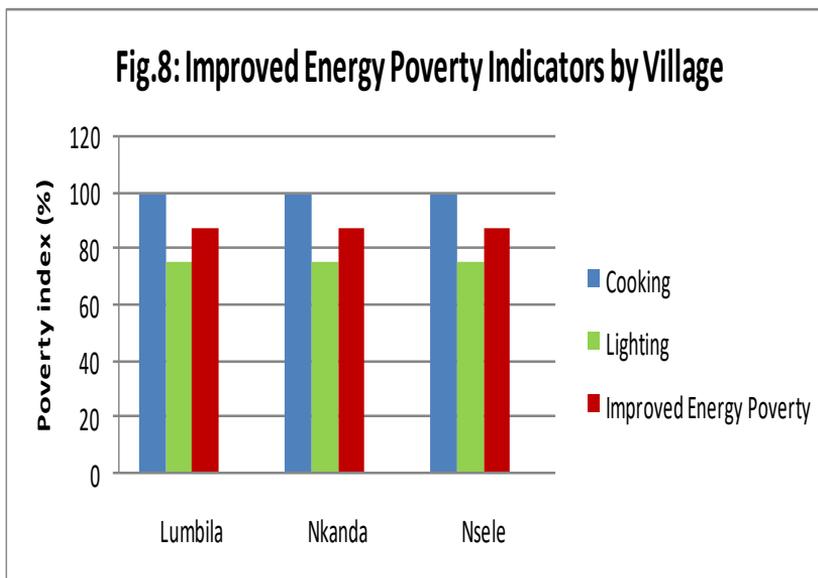


**Plate 9: Fish Trap Hanged in a Mango Tree and Small Canoes Parked Along the Lake Shore**

**Source of Energy of the Household**

The main objective of any power supply policy is to reduce the over-dependency of households on traditional natural power supply resources like firewood which have proved to be detrimental to the environment (URT 2003; Mbonile et al 2016). As in all rural areas the main source of cooking energy is firewood (100%) and the major source of lighting energy is kerosene and just a few households used motor vehicles batteries as sources of lighting energy. On the other hand, the change to renewable energy like solar will take several years because of lack of capital for installation of solar panels. An attempt to put solar energy was made at Lumbila Catholic Mission was abandoned several years ago. A calculation of improved energy utilization by village clearly indicated

nearly all the villages have not shifted away from firewood as the main source of energy for cooking and kerosene as the main source of lighting energy and the overall index on energy is above 80% in all the villages (See Fig.8)

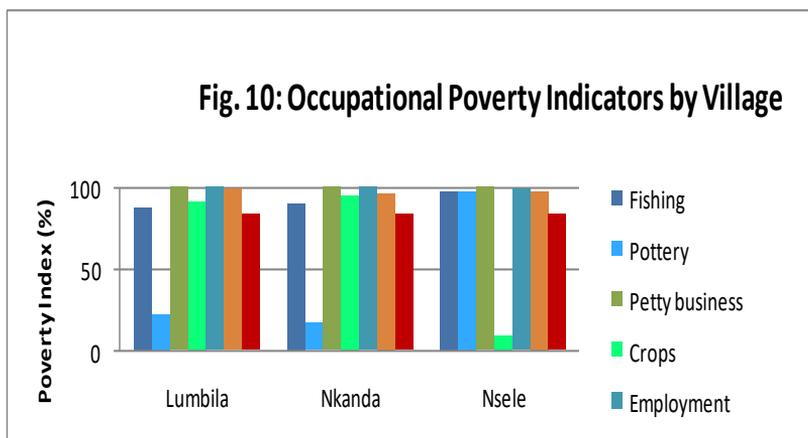
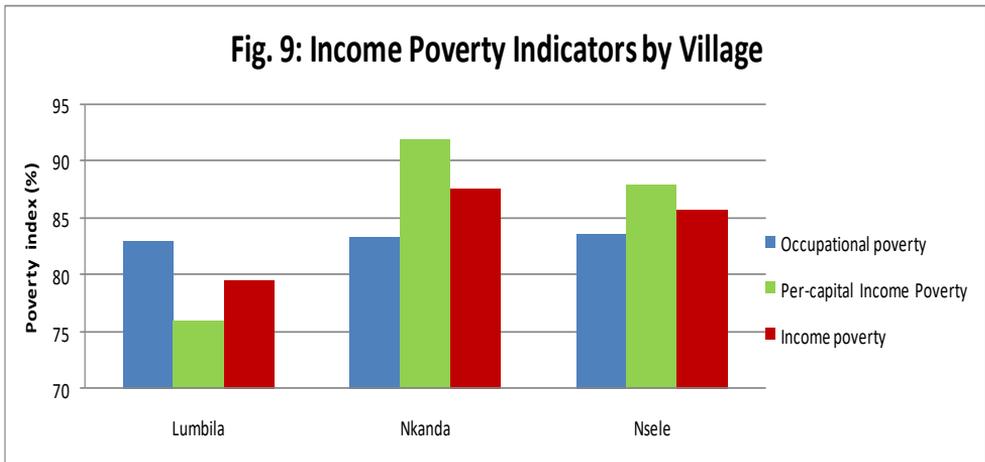


### *Source of Income of Households*

Pass et. al. (1988) in Collins Dictionary of Economics defines income as the flow of returns from factors of production like farming, wages, rent and interests over a period of time. Hence in the case of the study income was estimated from sales of crops, fishing, pottery and remittances which were the major sources of income in rural areas. As a whole the results of the study indicated that the main source of income in Lumbila and Nkanda Villages which contributed about 77% in Lumbila Village and about 83% in Nkanda Village was pottery. This because these villages are more endowed with resources of pottery making industry in the whole of Ludewa District and they can only compete with Ikombe Village in Kyela District Nonetheless, the main contributor of household income in Nsele Village was crops which contributed about 91% of the total income earned for this village ferries pottery raw materials by using canoes from neighbouring villages like Lumbila.

On the other hand, despite these earnings from pottery and other sources of income it shows that these villages were still poor because the majority earned an average income lying between Tshs 1-20,000/= per month. The contribution of petty business and fishing to the overall income was low. On the other hand,

the per capita income of Lumbila Village (Tshs 43,350/=) (Tshs 560,000/= per annum) is higher than that of Nkanda (Tshs 22,275/= (Tshs 267,290/= per annum) and Nsele (Tshs 29,709/= (Tshs 356,508/= per annum) because it has a high component of employed workers in primary and secondary schools. Moreover, as an indicator of poverty most of the income was used in buying food especially beans and bananas from Matema market. A small proportion of income was used in paying social services like buying medicine and school fees and the rest is used for buying liquor especially local beer called *komoni*. The overall calculation of income poverty indicators have shown that Lumbila with a primary school, secondary and a mission centre have low occupational poverty and income poverty when compared to Nkanda and Nsele Villages (See Fig .9 )



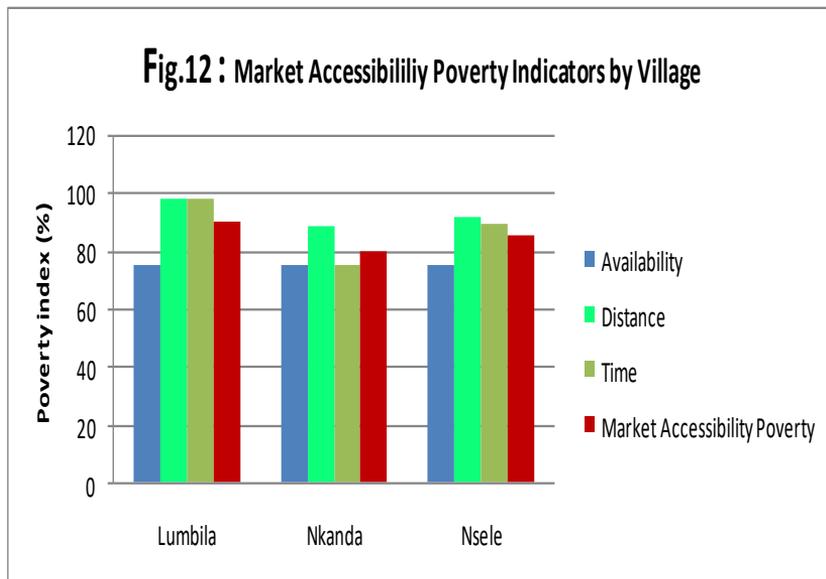
When the calculation of occupational poverty indicators was done it indicated more squid relations by occupation because of gender specialization in fishing which is largely male dominated and pottery which is largely female dominated

and there was no significant differentials between villages in terms of petty business and crop production (see Fig. 10).

### ***Crop Production and Marketing in the Study Villages***

Food is any substance or materials that are consumed to provide nutritional support for the body or for pleasure. It usually originates from plants and animals. More often it contains essential nutrients such as carbohydrates, fats, proteins, vitamins, or minerals. It is digested and assimilated by an organisms to produce energy, stimulate growth and maintain life (Katz 2003; Mungongo 1998). Unlike other rural areas in Tanzania the study villages lack adequate traditional cash crops like cocoa and cashew nuts which are grown in neighbouring districts like Kyela which make them depend solely on food crops like maize and cassava which are inadequate in sustaining the livelihoods of the Kisi. The marketing of these crops depends on local vendors who collect these crops and sell them in Matema market. There are few foreign vendors who manage to sell these commodities in Malawi which has better market than Kyela District. On the other hand, the smooth marketing of these crops is hindered by the long distance to market which consumes a reasonable amount as transport cost. Another problem is the distance to the market where people use more than three hours to reach the markets (Plate 10).

As indicated in Fig. 12 market accessibility is the biggest problem faced by nearly all villages along the shore of Lake Nyasa because the lake is bounded by very steep slopes which allow very little chance for the construction of infrastructure like roads. The population has to rely wholly on boats which ply along the lake. This problem has compelled villages like Lumbila and Nkanda to buy their own boats or hire them from the Mission or in Matema Beach which are relatively expensive. As result the poverty indicator is very high in all aspects like availability, distance to market and time used to the market. This gives an overall poverty indicator of more than 80% which is very high compared to villages like Ikombe in Kyela district which have a similar pottery industry

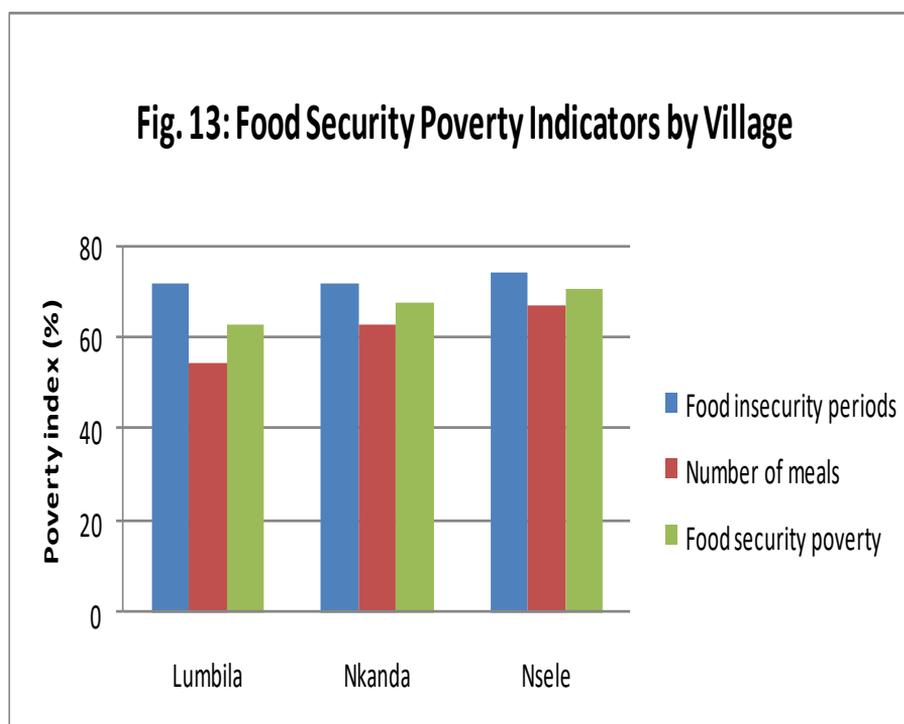


**Plate 10: Drying Cassava in a Stall Ready for Pounding into Flour**

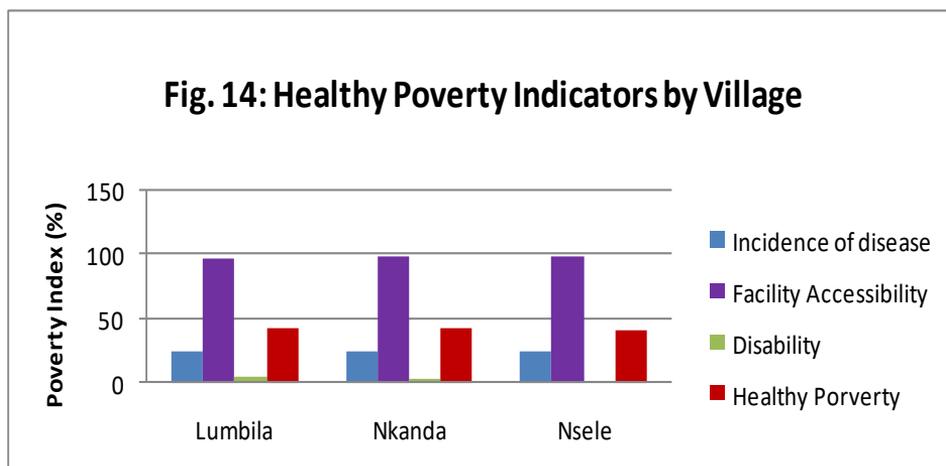
### ***Food and Health Vulnerability of Study Villages***

Food security refers to the availability of food in a household or community and a household is considered food secure when its household members do not live in hunger or fear of starvation (Mbonile et al 2010). Globally it is estimated that in 2010 around 900 million people were chronically hungry due to extreme poverty while up to 2 billion people had food insecurity intermittently due to varying degrees of poverty. Meanwhile food insecurity has been described as a condition in which people lack basic food intake to provide them with the energy and nutrients for fully productive lives (FAO 2003). The food security indicators show that most villages had food insecurity which ranges between 1 to 3 months especially during crop planting seasons between November and January every year. Nonetheless, there were some households which had

chronic food insecurity ranging between 5 to 11+ months. This problem is further aggravated by the scarcity of land along the shores of Lake Nyasa whose slopes rise abruptly from the lake. Open spaces are available only along the mouths of rivers and a few lake inlets. This food insecurity is clearly reflected in the number of meals taken by households where the majority of households take two meals instead of three meals a day. Nonetheless, the households are better in terms of fish as a source of protein because of the presence of the lake but this source is threatened by the dwindling of several fish species due to the salinization of the lake. On the other hand, as in all coastal areas with high morbidity, most households suffer from malaria and other infectious diseases such as cholera, HIV/AIDS, measles and polio. In terms of health services most villages have dispensaries although they are well known for lack of essential services like medicine. Another health vulnerability is the presence of population with disabilities and these include the dumb, blind, deaf, mentally retarded, albino and cripples. A calculation of Food security poverty indicators as shown in Fig. 13 indicated that all villages experienced food insecurity because of poor land for agriculture and dwindling fish supply due to overfishing and lake water pollution with time. This is also reflected in the number meals taken per day by households.



In terms of health poverty indicators it shows low incidences of diseases due to high intervention of treated mosquito nets and the presence of dispensaries in nearly all the villages. Nonetheless, there is a low proportion of disabled people in the villages (See Fig. 14).



#### *Environmental Degradation Vulnerability in the Study Villages*

The linkage between population, environment and natural resources exploitation can be shown by the association between consumption, and technology used by the people in whatever activity which utilizes these resources (DTU/UNFPA 2003). The results of the study indicated that the villages making pottery face several environmental degradation problems which included soil erosion due to cultivation in slopes exceeding 60 degrees and face other problems like deforestation (21%), water pollution of both rivers and lakes (12%). When it comes to the solution of land degradation several suggestions were given which included afforestation, out-migration and use of terraces (ridges in steep slopes) and use of fertilizers (See Table 6)

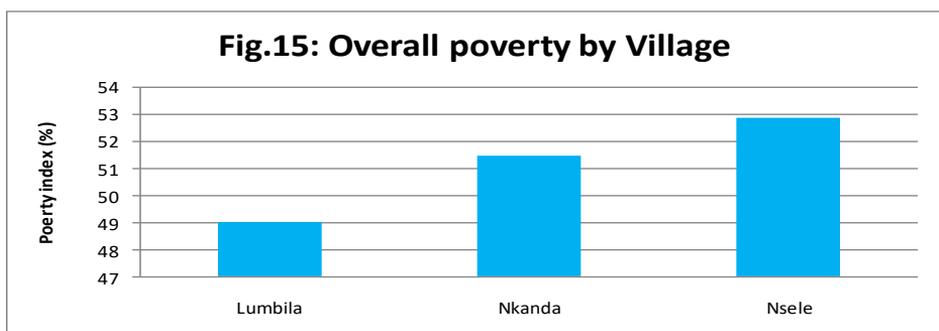
**Table 6: Environmental Degradation Vulnerability of Study Villages**

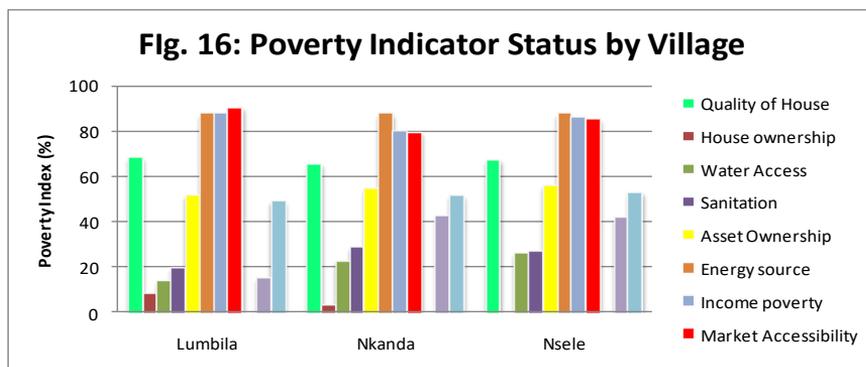
Type of Environmental Degradation	VILLAGES			TOTAL
	Lumbila	Nkanda	Nsele	
Soil erosion	61.1	70.1	60.5	<b>63.4</b>
Deforestation	15.6	20.9	26.7	<b>21.0</b>
Water pollution	21.1	3.0	9.3	<b>11.9</b>
Others	2.2	6.0	3.5	<b>3.7</b>
<b>N</b>	<b>90</b>	<b>67</b>	<b>86</b>	<b>243</b>
<b>Solution to environmental degradation</b>				
None	33.3	38.8	37.2	<b>36.2</b>

Type of Environmental Degradation	VILLAGES			TOTAL
	Lumbila	Nkanda	Nsele	
Afforestation	13.4	9.0	15.1	<b>12.8</b>
Out-migration	2.2	2.2	3.5	<b>2.9</b>
Use of terraces	50.0	47.8	43.1	<b>46.9</b>
Use of fertilizers	1.1	1.5	1.2	<b>1.2</b>
<b>N</b>	<b>90</b>	<b>67</b>	<b>86</b>	<b>243</b>

### Overall Poverty Indicators

The calculation of overall poverty indicator is summarized in Figs 15 and 16. Overall Lumbila Village with intensive production of pottery and better transport for pottery has lower poverty index (49%) compared to Nkanda Village which has access to pottery raw materials (51.5%) and Nsele (53.9%) which is located very far from the pottery raw materials. As far as individual indicators were concerned the quality of housing in most of these villages is poor. This is also reflected in improved energy resources, improved water access, sanitation and health and asset ownership. As far as income poverty is concerned Lumbila Village is better off than other villages because of occupation diversification. The major hindrance in poverty alleviation of these villages is the poor access to the market. Pottery being a fragile commodity requires very efficient and reliable transport which is lacking in these villages.





## Conclusion

The calculation of various indicators of poverty and their relationship to pottery industry indicated that pottery has some impact on poverty alleviation among the Kisi in Ludewa District. This is verified by the type of housing which the people own whereby people involved in pottery industry had slightly better housing. The same was applied to income poverty where villages like Lumbila and Nkanda had a higher per capita income when compared to Nsele Village which depends more on crop marketing than pottery. In terms of household asset ownership there were small differentials among the villages and this was also reflected on the utilization of improved power, health and sanitation. The main bottleneck in the alleviation of poverty among the Kisi people was lack of reliable inland transport which was hindered by steep slopes close to the Lake and unreliable motorboats which ply along the lake. Some villages like Lumbila have managed to purchase a boat but in the case of Nkanda due to management problems the boat has been abandoned. The overall indicator shows that Lumbila village with more diversified economy had higher per capita income than the other villages. Besides this the villages were vulnerable to environmental degradation and disasters related to health.

## Acknowledgement

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