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POVERTY AND HOUSEHOLD/FAMILY SIZE IN TANZANIA: MULTIPLE RESPONSES TO POPULATION PRESSURE?

C. Lwechungura Kamuzora
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RESEARCH ON POVERTY ALLEVIATION

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University of Dar es Salaam

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Acknowledgement

ABSTRACT

In population/development terms poverty is viewed as being associated with higher family/household size. In a 1996 survey of rural Bukoba District, Tanzania, for sources of poverty by Kamuzora and Gwalema (1998), two findings were made, prompting further study. One was that poverty level seemed to decrease with higher household size and number of children. Two, a significant majority of men and women of reproductive age reported having two or more children beyond what they desired, and despite complaining of rising child costs, only less than 19 and 30 percent respectively, were using methods of fertility regulation.

These observations raise a fundamental question on how people respond to population pressure. Are there response mechanisms different from limiting fertility, thus enabling high population levels with less poverty? Could it be a life cycle process of by accumulation of wealth also creates a bigger family overtime? Literature survey was done on these issues on the basis of which a survey was conducted in 1998 in the same villages as those of 1996.

Findings, corroborated by the nationwide 1996 Tanzania Demographic and Health Survey, ascertain, at high statistical significance, a pattern of less poverty with higher family/household size. Explanations, also statistically significant are that in a labour intensive socio-economy it is households that have more labour that are less poor. On the issue of population pressure it creates out-migration, postponement of marriage, and some form of family limitation. However in more developed regions such as Kilimanjaro that had gone through these responses, compared to Lindi/Mtwara Regions, the less poverty pattern no longer holds.

The interpretation is that there is a life cycle process of accumulation of wealth leading to increased household/family size while at the same time accommodating changes due to modernisation as in the case of Kilimanjaro region. The population/development debate and programmes should thus be focussed on helping people spacing children rather than determining the number of children for them.

However, the paradox still remains as to why high proportions of bigger households are still in the poor category. This and other limitations need further study.

POVERTY AND HOUSEHOLD/FAMILY SIZE IN TANZANIA: MULTIPLE RESPONSES TO POPULATION PRESSURE?

1.0 Background

1.1 Background, Statement, Significance of the Problem

In a recent (1996) survey of rural Bukoba District by Kamuzora and Gwalema (1998) two intriguing findings were made. One significant finding is that households with a higher number of members showed lower poverty levels than those with fewer members, (controlling for intervening factors of age of head of household and whether female headed or not). A preliminary look at national level survey data, the 1996 Tanzania Demographic and Health Survey (TDHS), seemed to indicate the same.

Secondly, the majority of men and women reported having an "excess" of two or more children above their original desire, and were at risk of further childbearing, despite complaints of rising child costs. Yet only less than 30 and 19 percent of women and men respectively, reported using methods of fertility regulation. Similar findings are seen in the TDHS (Tanzania, 1993, 1996X where contraceptive prevalence is observed at only less than 20 percent. Further, analysis of these TDHS data has shown that even for women with some formal education the probability of using contraceptives is calculated at an average of only 12 percent (Komba and Chuwa, 1998) In the Bukoba survey, people hardly perceived having many children as putting one at risk **of** becoming poorer.

These observations indicate not only that Tanzania's (1992) Population Policy and the National Family Planning Programme (1970's) have had limited success, but are also a reflection of underlying complexities of life realities that a lot of families and individuals are experiencing for the patriarchal power relationships within families also play part whereby the women and children labour while the male head appropriates the product. This may account for the nega relationship between family size and poverty. It also points to knowledge gaps that could facilitate policy strategies. For example, the Tanzania government, despite being supported b> bi- and multi-lateral donors has had little success with population programmes.

1.2 Basic concepts

1.2.1 Household, Family size

Household size consists of the number of persons usually residing in household and share household expenses ('common' kitchen).

Family size is the number of household members including children of the head wherever they live. Family size is more pertinent to this study because the welfare of a household is also drawn from a larger network of relationships. It is however, practically impossible to enumerate all relations in a survey.

1.2.2 Poverty

Poverty is a condition of living below a defined poverty line or standard of living (Bagachwa, 1994; Mtatifikolo, 1994; Semboja, 1994); the line varies depending on social, political, economic and cultural differences. Its measurement in this study is by a possessions index, a composite of household possessions, mainly that of the head, and housing quality. There are problems of using "stocks" e.g. possessions instead of the relevant "flows" e.g. income or consumption. Possessions are generally found to correlate with income and level of living (Sender and Smith, 1990; Kamuzora and Gwalema, 1998). In this study a household in the poor/less poor category is defined as:

Poor=l: poor housing (earth walls/floor or thatch roof, or improved housing but with only minimal possessions such as a bicycle or radio, but not both; (others are goats, tables, chairs; unsafe water source, or poor or no toilet facility).

Less poor=0: improved housing (cement walls/floor and corrugated iron sheets or tile roof, and possessions beyond that of the poor, i.e., electricity, refrigerator, television, motorcycle/car/lorry).

2.0   Objectives of the Research
The objective of this study is to investigate whether poverty levels of small and large households differ and factors associated with the differential. Special attention is given to multiple responses to pressure of the size of a family/household.

3.0   Literature Review
There are three points of focus: (a) the relationship between family size and poverty; (b) response mechanisms to population pressure; and (c) the reality of the economics of production in African conditions.

3.1   Family Size and Poverty
The mainstream approach to effects of family size on wellbeing is based on a neo-malthusian ceteris paribus assumption of negative effects of high fertility. This collaborates with Coale and Hoover (1958) thesis of savings for investment derived from lower proportions of children, following reduction of fertility. Indeed the frontal approach of family planning programmes has been justified from the thesis. However the Coale-Hoover thesis has been challenged by findings from two reports on the effect of population growth on development, sponsored by the (American) National Academy of Sciences/ National Research Council (NAS/NRC). Ahlburgh (1998: 352, footnote 3) which concluded that there was no clear evidence either. Easterlin (1967) also observed this decades earlier. Kuznets (reported in Ahlburg, 1998) had first found positive relationships in 1968 but later found none in 1973. A number of scholars have assessed the phenomenon in Review Symposiums and the World Bank 1984, World Development Report (1986: 563-85; 1985: 113-38). At the 1994 United Nations International Conference on Population and Development (ICPD) in Cairo, the main thrust of family size and poverty was focusing

"welferist" issues like women's reproductive health (McNicoll, 1995). This approach calls for consideration effectors beyond neo-Malthusian response of limitation of fertility.

3.2 Multiple Responses to Population Pressure

The pioneering thesis by Boserup (1965) offers insight into realistic demographic behaviour. It portrays population growth and pressure as a resource: creating challenge and forcing invention of better productive techniques. Both economic theory and empirical evidence have over time clarified these views.

Julian Simon (1981, 1996: **RIP**, 8 Feb., 1998) puts clearly the economics of population challenge: related scarcity pushes prices up, leading to development of cheaper substitutes, as the world has clearly witnessed, as was the case subsequent to the oil crises of the 1970's. At another level evolution of higher yield agricultural systems have been observed, e.g. in Ukara Island (Ludwig, 1968), mountain slopes of the Kilimanjaro (Maro, 1975), and "More People Less Erosion" found in Machakos, Kenya by Tiffen *et al* (1994). Boserup has assumed diminishing marginal returns to labour a factor that has been contested by Branson (1970) with empirical evidence, and critical review by Grigg (1979). The out-migration that Boserup regarded as sign of failure of the above endogenous development is however seen as part of response to population pressure: people go out to colonise new lands, or out-migrating to town. The latter has been found by Gould (1999) to be an important response that keeps rural families afloat.

Indeed these demographic responses, precursors to limitation of fertility, had been pointed out by Kingsley Davis (1963) in a theory of multiphasic demographic response to population pressure. There are a variety of responses including out-migration, postponement of marriage and fertility regulation, both simultaneous and inter-temporal, depending upon the ease with which the community can relieve the strain through out-migration (Friedlander, 1969). Case* studies of Davis' proposition indicate a wide range of simultaneous and inter-temporal responses in Costa Rica (Klijzing, 1985), Korea (Kim, 1992), the Philippines (Xenos, 1996), and Puerto Rico (Mosher, 1980). Changing relationship over time between fertility and socio-economic status, have been observed in Java (United Nations, 1984), the United States and Japan (Kuroda. 1977). hi Asia postponement of marriage (a malthusian response) is reported to have been one significant factor for initial decline in fertility (Leete, 1987). The European experience shows how the colonisation of new distant lands before 1870's was the onset of decline in fertility Importantly, the traditional "nuptiality valve" (Hajnal, 1965) of low proportions married, e.g. in Ireland, kept natural fertility lower than that in developing countries, and was the determinant of fluctuations in pre-20[111] Century fertility (Smith, 1981, 1983).

3.3   African Production Conditions

In African labour intensive production conditions, labour is observed to be the limiting factor to output (Ruthenberg, 1968; Cleave, 1974; Kamuzora, 1980). Higher density with increasing population can mislead one to assume land then becoming the limiting factor. This could be true in the short-run. However case study examples like that of Ukara Island and Kilimanjaro show that the outcome depends on what agricultural communities finally go into. Thus even in the

survey area of rural Bukoba District, which has relatively high population density, labour shortage has been observed (Friedrich, 1968; Kamuzora, 1980).

The rural labour shortage situation in Africa is complex. Paradoxically only a few hours (2-4) per day are put into farming. This could have been the basis of neo-classical theories of surplus labour in traditional economies, (Lewis, 1955, Fei and Ranis, 1963). However research, notably those based on time budget studies reveal objective conditions that people face leading to few hours input. These are seasonality of agricultural operations and non-farm work activities (Cleave, 1974), done as a survival strategy e.g. in Tanzania (Omari, 1994)). A time budget study of smallholder farm households in Bukoba District reports of factors that constrain labour time, in addition to the above: obligatory social activities, e.g. care for the sick (and oneself being ill), attending funerals etc (Kamuzora, 1980).

Further, the gender considerations add another dimension. An extremely heavy workload for women is a widely observed phenomenon analysed for example by McCall (1984), Mbilinyi (1988), Njiku (1990), Bryceson (1995) and various studies in Bryceson's (ed.,1995) African "Women Wielding the Hoe ....", and Kamuzora and Gwalema (1998).

The labour value of women and children (and a variety of child services) has been shown to explain traditionally high fertility (Caldwell, 1977), pertinently in Bukoba District (Kamuzora, 1984), with patriarchal power relationships ensuring both reproduction and production (Meillassoux, 1972, 1973).

Maintenance of agricultural output may not be the only income element showing relationship of less poverty with higher family size. While an increase in agricultural output may fail to match with population growth, there are also other non-malthusian response mechanisms that augment income, or prevent further pauperisation.

The family planning research industry looks at responses to pressure of a large family in terms of fertility limitation: desire for a few children e.g. in DHS surveys (op. cit). However, the low contraceptive prevalence seen above gives contrary picture. It is therefore possible that other new non-malthusian endeavours have been adopted. Notably African women, with deteriorating economic conditions, have extended from subsistence production to cash earning activities to augment household income (Mbilinyi, 1988; various articles in Bryceson (ed.), 1995). Costs of rearing children themselves have been suggested to be shared by a wide circle of kinship relations, e.g. through fosterage observed in West Africa (Isiugo-Abanihe, 1985), older helping young siblings, and the whole economic value of children that has explained persistence of high fertility in Africa (Caldwell, 1977). However the extent to which these practices are prevalent in the current situation of rapid modernisation, which to a great extent is non-child oriented westernisation, also needs study.

It is therefore not unrealistic to imagine a multiple response to population pressure, without excluding that of limiting fertility, or spontaneously postponing marriage. The first responses by the majority are endeavours to increase income by working harder. This can be seen through out-migration and colonisation of new lands, agricultural intensification, non- and off-farm income generating activities before or overlapping with a malthusian response sequel of postponement of marriage and limiting fertility. Thus, given the conditions of labour intensive production, and considering also other avenues supplementing income, it may not be surprising to see less poverty with higher family size.

4.0   Hypothesis

The pattern of poverty level versus family/household size depends on the stage of development (modernisation) a community has reached. For rural Bukoba District, like other still largely agricultural peasantry societies, less poverty with larger family/household size phenomenon is expected because of multiple non-neo-malthusian response mechanisms to population pressure, including land intensification and extensification, out-migration, and non-farm activities; and sharing of children by a wider circle of kinship. This also explains the observed low contraceptive prevalence.

There are knowledge gaps and differing views on the effect of family size and poverty. The need for new dimensions has led to this study.

5.0   The Survey Area and Metlu lology

Kanyigo Ward, from which study villages were selected is part of Bukoba District in Kagera Region. The ward borders with Rakai District of Uganda, where the AIDS epidemic is thought to have been the epicentre. This disease has disrupted the life of the area in more serious ways than can be described here. It has created new family/household types as will be explained in this study.

Bananas are grown as staple and coffee for cash. However economic deterioration and pests (e.g. the banana weevil) has reduced the importance and availability of these crops.

Both quantitative and qualitative information was collected through a sample survey, and in-depth study by focus group and household individual member interviews. It was complemented by quasi-participant observation by the principal investigators during the duration of pilot and sample surveys. The target unit of observation and analysis is a male-headed household the wife, the expected dominant type and individuals within it. The following are descriptions of data collected, sampling design and methods of data analysis.

5.1 Data

The dependent variable is poverty level. This was to be measured by a possessions index, constructed from household items considered for wellbeing, namely of tables, chairs, radio, bicycle etc, and housing quality. This measure has advantages over direct measures such as income and expenditure.

As argued convincingly and used successfully in a study in Lushoto by Sender and Smith (1990, pp. 28-29), and in Bukoba District by Kamuzora and Gwalema (op. cit.) this index of material well-being, is: (i) not only simple but importantly, its inputs, though stocks, have generally been observed to be closely correlated with current well-being (from flows of income services) and shows overall economic status of respondents as measured by other indicators e.g. landholding, cropping patterns, use of productive inputs, and access to education and health services. The Tanzania Demographic and Health Survey collected also degree of a household's food security flows. Its correlation with the possession index (stocks) will be shown after description of the latter, (ii) it is not distorted by memory lapse, nor subject to ability of respondents to distort or mislead, and exaggerate or underestimate like in income; (iii) questions require definite answers; (iv) information is both easily collected by research assistants with little training, and its elements are physically seen e.g. housing.

Concern has been raised over using "stocks", e.g. possessions instead of "flows" e.g. income or consumption, the more relevant and direct measures of poverty or wellbeing. Kilimanjaro Region has been given as an example "... where a lot of transfer payments go into construction of houses and very little to productive capital accumulation and direct consumption." Yet it is observed to "... experience significant malnutrition among children even though it is one of the leading regions in terms of education, growth and transfer payments into the region." In the Tanzania Demographic and Health Survey 1996, information was collected on food security, which is certainly a critical and direct measure of poverty. Regression of this variable on the possessions index used in this study (see direct computer results in Appendix 3) shows a fair and significant ($p < .001$) degree of association between the two variables.

Information collected for the study were of two types:

(a) Pattern of poverty with family/household size, the focus item: members and number of living children categorised by labour force status e.g. age category; then correlates of poverty, namely age (proxy for life cycle), and education of the head of the household for control in the analysis;

(b) Explanatory, for the poverty/household size pattern: non-neo-malthusian multiple response variables: family dispersal and colonisation of new lands, indicated by residence and migration experience of household members, parents and siblings of the head of the household; malthusian response: postponement of marriage (measured by generational change in age at marriage); neo-malthusian response: number of children born, desired and reasons, and fertility regulation.

A survey questionnaire to measure these variables was developed and administered to the household by local research assistants. Use was made of a translated Luhaya version in order to convey the meaning of questions direct to the respondent/interviewee.

Qualitative information was gathered by focus group discussion on points raised above in the research questions, the literature review, and survey questionnaire, focusing on the main issue of the study: how people in varying family sizes maintain wellbeing. This was done by organising homogeneous (sex-age specific) focus groups during the pilot survey in the villages to be studied. The survey questionnaire was also tested then. From this experience an appropriate final questionnaire was designed: the right questions to be asked and how. After preliminary data analysis a seminar for samples from each focus group was held to give a final interpretation of findings. This had been found to be fruitfully rewarding (Kamuzora and Gwalema, op. cit). An attempt was also made to visit samples of small and large households to provide vivid situations of their differential wellbeing, especially in view of the findings of possible variety within each of the poor and less poor categories.

5.2   Sampling Design

A random sample of 320 households, homogeneous by having at least a husband and a wife, the so-called normal household, had been intended. These were to be reached by random selection of ten-cell (household units) forming a village. It was ideally to consist of 4 groups with 80 households in each: 40 with large and 40 small family sizes, at life cycle stages (of the head-efa household) of, young (20-35), young middle (35-44), middle (45-54), old (55-74). Beyond these they were viewed to be too few and old. Thus each cell was to contain either small or large households, with a statistical minimum of 30 to 40 for reliable estimates hence the 320 sample size.

This plan was proved to be only good on paper. Bugombe village was reported to have more than 500 households, only 140 households of the target type were in existence. A supplement was sought in Kigarama village, of 600 households; but it provided only 161. The balance of 19 was sampled from the adjacent village of Bweyunge (commonly known as Nshumba).

5.3   Analysis

Analysis of quantitative data is done at two levels. First bivariate display of information to first see simple relationships of variables, by cross tabulations and Chi-square tests are done. At a higher level multivariate analysis is done with use made of logistic regression (in e.g. the SPSS package (Norusis, 1990)). This is a powerful statistical method that not only overcomes weaknesses of ordinary least square (OLS) regression, particularly binary-only value dependent variables. The advantage is that it shows the extent of differences in the dependent variable for category levels of independent variables.

Focus group discussions held were done for sex-age homogeneous groups. Information obtained facilitated quantitative analysis and correct interpretation of research findings.

Secondary data, importantly the nationwide Tanzania Demographic and Health Survey (TDHS) 1996, with an appreciable sample size of 7969 households, is also analysed for independent evidence on the main issue of study, i.e. patterns of poverty with family/household size. An additional set of survey data from the Kaguru, conducted by the author and Penina Mlama in 1994, also added to independent evidence on the rather intriguing pattern of poverty.

6.0   Research Findings

The study establishes poverty levels and then proceeds to analyse patterns of poverty with family size. Construction of a possessions index, a proxy for poverty level as argued above, is detailed in Appendix 1. A combination of housing quality and possessions index determined two 'Poverty Categories' (to facilitate logistic regression analysis). They are as follows:

0.   **LESS POOR**: improved housing OR modem house but owning minimum of radio and bicycle (possessions class 2),

1.   **POOR: poor** housing, OR improved or modem housing but only in minimum possessions class (up to bicycle OR radio: i.e. possessions class 1).

6.1   Poverty level in Tanzania

The following is the distribution of households by the two poverty categories described above, from two surveys: Bugombe-Kigarama 1998, rural only, and the national level TDHS 1996, with both rural and urban parts.

Table 1: Poverty levels

Category	Code	Tanzania 1996		Bugombe –Kigarama
		Total	Rural	(Bukoba) 1998
Less Poor	0	35.4	24.0	45.6
Poor	1	64.6	76.0	54.4
Total		100.0	100.0	100.0
(sample hhs)		(7835)	5952	320

Tanzania poverty level can be observed in the TDHS: nearly two thirds (about 65 %) of households live in poor housing of earth/mud/thatch and only minimum possessions of only up to a radio or bicycle but not both. Being most rural, this corroborates Cooksey's (1994) observation of 60 percent, although the TDHS shows it to be worse, over three quarters. Thus, though a bit lower, Bugombe-Kigarama depicts similar rural poverty: over 54 percent of the rural population can be characterised as living below the poverty line.

6.2   Poverty and family size

The focus of this study is patterns of poverty by family and household size and explanations of these. Table 2 shows the distribution of households by the two poverty categories at each size of family/household in Bugombe-Kigarama.

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Table 2:7   Percentage distribution of household by poverty category and size of family in Bugombe-Kigarama Villages

Family Size				Household Size			
Family	**Less poor**	**Poor**	**Total (n)**	**Household**	**Less poor**	**Poor**	**Total (n)**
Size	%	%	%	Size	%	%	%
1-4	29.1	70.9	100.0(86)	1-4	35.2	64.8	100.0(128)
5-8	45.7	54.3	100.0(127)	5-6	48.1	51.9	100.0(104)
9+	58.9	41.1	100.0(107)	7-9	58.0	42.0	100.0(88)
Total	**45.6**	**54.4**	**100.0(320)**	**Total**	**45.6**	**54.4**	**100.0(320)**
Chi- sq	Value	df	Sign.	Chi- Sq	Value	Df	sign
Person	17.08	2	.0002	Person	11.30	2	0035

NB: Grouping are different for family and household size: the size of sub-samples determined this.

It can be clearly observed that percentages of families/households in the Less Poor category (0) become higher the bigger the size of families/households. This is highly statistically significant, i.e. at low statistical significance level of error, p=.0002 for family size and p=.00352 for household size, confirming that bigger families are less poor than smaller ones. The TDHS 1996 corroborates this finding, only that the largest household was of 7 members and that has higher proportions less poor, 40.6, against the others all at a little under 34 percent (see Appendix 2). The pattern becomes clearer when control is made for other intervening variables.

The possibility of differential mortality, making for the poorer households to have lost more members is not borne in the survey data. Though not shown, as a matter of fact it is the less poor who show a tendency of having lost more children, but nowhere nearly significant statistically: the level is p= .7.

The findings of less poverty with higher family size need a closer scrutiny. Looking at correlates - intervening variables of poverty, and their control will show whether the above poverty pattern still emerges. These are sex, age, (rural/urban) location, and education. These relationships have been observed before, for example in the survey area, by Kamuzora and Gwalema (1998). In the TDHS data, their bivariate cross tabulations with poverty level, with Pearson's Chi-square test results, are shown in Appendix 2. Results show that households that are less poor have a male head, of higher age (stage of life cycle) and education, and are in urban localities. However for age the TDHS data show that younger headed households appear to be less poor, contrary to the Bugombe-Kigarama survey, or even to expected life cycle stage, particularly for a basically agricultural socio-

economy in most Tanzania. But, as will be seen in the multivariate analysis, it does not change the results.

Table 3a shows logistic regression of poverty level with household, family size, and husband's number of living children in Bugombe-Kigarama 1998, controlling for the above intervening variables. Corroborative survey evidence from Tanzania-wide survey, the TDHS 1996 and a smaller one among the Kaguru 1994 are presented in Tables 3b and 3c respectively.

Table 3a: **Logistic regression of poverty level with household, family size and husband's number of living children controlling for intervening variable: Bugombe-Kigarama, 1998**

Variable	(n)	B	S.E.	Df	Sign.	R	Exp(B)
			(a) Household Size				
Household Size				2	.0858	.0454	'
1-4(1)	(127)	.6517	.3103	1	.0357	.0738	1.9187
5-6(2)	(104)	.5711	.3164	1	.0711	.0533	1.7702
7+ (4) (Ref.)	(88)	-	-	-	-	-	1.0000
Husband Age	(A9)	-.0263	.0079	1	.0008	-.1439	.9740
Husband Educ.	(A10)	-.2250	.472	1	.0000	-.2165	.7985
			(b) Family Size				
Family Size				2	.0923	.0416	-
1-4(1)	(85)	09379	.4306	1	.0294	.0788	2.5546
5-8 (2)	(127)	.4384	.3264	1	.1792	.0000	1.5502
9+ (3) Ref.	(107)	-	-	-	-	-	1.0000
Husband Age	(A9)	-.0156	.0102	1	.1271	-.0272	.9845
Husband Educ.	(A10)	-.2115	.0467	1	.0000	-.2048	.8094
			(c) Husband's number of living children				
No. of Children				3	.0143	.1016	-
0-2 (1)	(107)	1.3145	.4374	1	.0027	.1261	3.7230
3-4(2)	(71)	.6525	.3882	1	.0928	.0432	1.9204
5-6(3)	(57)	.9951	.3896	1	.0106	.1011	2.7051
7+ (4) Ref.	(84)	-	-		-	-	1.000
Husband Age	(A9)	-.0112	.0101	1	.2701	.0000	.9889
Husband Educ.	(A10)	-.2144	.0473	1	.0000	-.2046	.8070

Index: Less Poor = 0; Poor = 1

The results show the higher the size of a household or family the less poor it is, highly significant statistically. This is clear for a small household or family of up to 4 members: it is, respectively, nearly 2 and over 2.5 times poorer than the biggest family of 7 and 9 persons and over. We can look at it in terms of the number of children one has. From the same table above it can be observed that the smallest household, one with up to two living children is nearly 4 times poorer than the biggest one with 7 or more children. Education attainment by the head of the household is negatively related with poverty, but not changing the less poverty/bigger household size pattern. Corroborative evidence comes from two independent surveys: the nationwide TDHS 1996 and the Kaguru 1994 shown in Tables 3b and 3c.

Table 3b: Logistic regression of poverty category with household size and proportion aged 15+ years, controlling for poverty intervening factors, Tanzania DHS 1996

Variable	(n)	B	S.E.	df	Sign.	R	Exp(B)
NDEJURE				3	.0000	.0936	-
(de jure household members)							
1-2 (1)	1588	.9495	.1089	1	.0000	.0863	.2.5845
3-4 (2)	2147	.6301	.0804	1	.0000	.0.773	1.8777
5-6 (3)	2023	.4471	.0762	1	.0000	.0571	1.5638
7+ (4)	1913	-	-	-	-	-	1.0000
LF15PROM				3	.0001	.0393	-
(proportion in ages 15+)							
<=.3(1	1058	.4657	.1082 1	.0000	.0407	1.5932	
.3-.5(2)	2435	.2992	.0852 1	0004	.0322	1 .3488	
.5-.6(3)	1625	.1672	.0920 1	.0692	.0114	1.1819	
.6+ (4)	2553	-	-	-	-	1.0000	
(Ref.)							
Sex of Head	(HV219)	.1791	.0750	1	.0169	.0193	1.1961
Age of Head	HV220	-.0024	.0022	1	.2909	.0000	.9977
Location	HV025	1.9088	.0656	1	.0000	.2912	6.7452
Education (yrs)	HV108S01	-.1930	.0100	1	.0000	-.1938	.8245

NB Coding:

Less poor=0; Poor= 1.
Sex (Male=l; Female=2); Loc. (Urban=l; Rural=2)

Table 3c: Logistic regression of poverty level with household size and number of living children among the Kaguru 1994

Variable	Size	(a)	B	S.E	Df	Sign	Odd ratio Exp (B)
(a) Household Size							
HOUSIZE					3	.0072	
HOUSIZE (1)	1-2	(150)	.76	.27	1	.0048	2.1
HOUSIZE (2)	3-4	(265)	.54	.22	1	0.145	1.7
HOUSIZE (3)	5-6	(194)	.68	.24	1	.0042	2.0
HOUSIZE (4)	7+						
Husband's Age			-.00	.01 .01	1	.4624	1.0
(b) Number of living children							
WCALVREC					4	.1121	
WCALVREC (1)	0-1	(213)	.57	.26	1	.0285	1.8
WCALVREC (2)	2	(149)	.65	.29	1	.0256	1.9
WCALVREC (3)	3	(133)	.67	.30	1	.0234	2.0
WCALVREC (4)	4-5	175	.50	.27	1	.0617	1.7
WCALVREC (5)	6+	(117)	-	-	-	-	1.0
Ref. Husband's Age			-.00	.01	1	.04601	9

The less poverty with higher family/household size pattern can be observed in these two survey data: smaller households are significantly poorer than the largest ones, additionally on number of children for the Kaguru survey (see last column Table 3c).

Overall what the evidence shows is that a big family does not necessarily make one poor despite results in Table 1 where still over 41 percent of bigger households (e.g. categories of size 5 and above) are in the poor category. This calls for further study. Varying opportunities under the reality of socio-political set-up particularly relevant in the Bukoba society with a history of monarchy and related patronage: access to land and ruling power are issues for consideration. Another possible factor is society in transition where varying ability to meet the pressure of a big household and access to take up opportunities may influence the income ability of some families. We now turn to explore possible explanations of these findings.

6.3 The nature of less poverty with higher family size

The basic hypothesis of the study is multiple responses to population pressure. These are like, (a) the Boserupian suggestion of invention of higher yielding production techniques or out-migration to colonise new lands; (b) malthusian responses of continence, effectively postponement of marriage, and (c) visions of what a family size should be and the limitation of fertility. These responses can be contemporaneuos or of inter-temporal sequence. Another explanation is looking at the production function: in a labour intensive socio-economy it is the family with more labour that will produce more, subsequently be more well off. Literature review showed that labour intensity is not only in agrarian society but critical to this study is the fact that labour shortage is widely observed especially when labour is still a 'normal' production input: the more the input the higher the production.

6.3.1 Household labour and poverty

Table 4 shows logistic regression of poverty level with size of household labour force.

Table 4: Logistic regression of poverty level with household labour, Bugombe-Kigarama Villages 1998

Variable	Labour Force	(n)	B	S.E.	Df	Sign.	Odds Ratio Exp(B)
	(a) All labour (ages 5+)						
LABOUREC (1) 1-2					3	.0100	-
LABOUREC (1) 3- 4		(86)	1.14	.35	1	.0013	3.1
LABOUREC (1) 5-6		(101)	.91	.34	1	0076	2.5
LABOUREC (1) 7+ (Ref.)		(75)	.65	.36	1	.0709	1.9
	(b) Labour ages 15-64						
LABR1564					2	.0100	-
LABR1564 (1)	1-2	(177)	92	.37	1	.0013	2.5
LABR1564 (2)	3-4	(106)	.50	.39	1	0076	1.6
LABR1564 (3) (Ref.)	5+	(37)	-	-	-	.0709	1.0

It is clear from Table 4 that households with more labour are significantly less poor than those with fewer hands. For example, starting with Bugombe-Kigarama villages as shown in Panel (a) the largest household that has a labour force of 7 or more persons compared to the smallest, with

one or two persons, is more than three times less poor; and a household with more labour approaches the biggest in well being. The traditional labour force ages 15-64 (Panel (b)) shows a similar pattern.

The table also includes children in the labour force. In the 1980's: young children were seen as providing relief on necessary but time consuming chores like fetching water, firewood, child minding etc. that enabled parents do other jobs (Caldwell, 1977; Kamuzora, 1984). In reality the existing labour force including children living and working away from home send remittances in cash or kind, the total of which make for what is seen as less poverty in bigger families. All these are observed in the rural areas. More important is that the interaction of household size and proportion in the labour force are significantly associated with less poverty.

Another area that requires analysis is the observable variations based on the different levels of development across regions. For example contrasting relationships of poverty level and family size between an area least developed with one that is more developed with a diversified economy/life styles. One could look at areas such as Kilimanjaro Region, with 54.0 percent of households in the less poor category and Lindi/Mtwara with only 18.2. These are shown in Table 5.

In Kilimanjaro Region, the relation of household size and the proportion of labour force with poverty level, is not significant. This is because the region has a diversified economy of farm and non-farm occupations, giving wide opportunity for individuals to earn a living, thus not depending on traditional household production alone. In contrast, the possibly largely agrarian economy of Lindi/Mtwara shows the importance of household labour availability in augmenting income. For Kilimanjaro, only the intervening correlates of poverty, namely sex, age and education, come into the equation, in contrast to Mtwara/Lindi where household size and proportion in the labour force are additional/correlates.

These results thus indicate changing relationship of less poverty/bigger household size in a labour intensive especially agrarian household peasant economy, to negligible proportions in a modern economy.

Table 5: **Logistic regression of poverty category with household size and proportion aged 15+ years, controlling for poverty intervening factors in Kilimanjaro and Lindi/Mtwara Regions (TDHS 1996)**

Variable	(n)	B	S.E.	df	Sign.	R	Exp(B)
			(a) Kilimanjaro Region				
NDEJURE				3	.8231	.0000	-
(de jure household members)							
1-2 (1)	78	.3694	.4206	1	.3797	.0000	1.4469
3-4(2)	111	.2458	.3322	1	.4593	.0000	1.2786
5-6(3)	120	.2211	.3183	1	.4873	.0000	1.2474
7+	89	-			.		1.0000
(Ref.)							
LF15PROM				3	.0793	.077	-
(proportion in ages 15+)							
<=3 (1)	59	.5727	.4105	1	.1630	.0000	1.7731
,3-.5(2)	112	.4057	.3215	1	.2069	.0000	1.5004
.5-.6(3)	81	.9410	.3641	1	.0097	.0925	2.5625
.6+ (4)	146		"		"	-	1.0000
(Ref.)							
-							
Sex of head		-.4069	.2683	1	.1294	-.0234	.6657
Age of head		-.383	.0088	1	.0000	-.1765	.9625
Location of hhold		1.5778	.3499	1	.0000	.1831	4.8443
Education of Head		-.3002	.0509	i	.0000	-.2451	.7407

Lindi/Mtwara Regions

NDEJURE.				3	0000	.1624	-
(de jure household members)							
NDEJURE (1)	193	1.9862	.4056	1	.0000	,1594	7.2879
NDEJURE (2)	285	.7573	.2791	1	.0067	0787.	2.1326
NDEJURE (3)	202	.1582	.2690	1	.5564	.0000	1.1714
NDEJURE (4)	115	-	-	-	-	-	1.0000
LF15PROM				3	.522	.0446	-
(Ref.)							
LF15PROM(1)	62	.9045	.4194	1	.0310	.0554	2.4707
LF15PROM (2)	229	.6498	.2754	1	.0183	.0642	1.9151
LF15PROM(3)	194	.2864	.2707	1	.2900	.0000	1.3317
LF15PROM(4)	310	-		-	-	-	-1.0000
(Ref.)							
Sex of head		.8025	.2915	1	.0059	.0803	2.2310
Age of head		.0098	.0077	1	.2029	.0000	1.0099
Location of hhold		.9108	.2159	1	.0000	.1351	2.4863
Education of head		-.1624	.0352	1	.0000	-.1493	.8501

6.3.2 Colonisation of new lands and out-migration

Colonisation of new lands and out-migration is looked at in terms of family dispersal. Table 6 shows distribution of both the respondents' fathers and brothers by place of residence in relation to the respondent. This shows the extent to which families have dispersed as, among other reasons, they grew up in number.

More than 54 percent of respondents live in locations other than that of their fathers. Among brothers it is even more clearly demonstrated. Only 28.2 percent that live on the same farm and virtually all have moved away from one another

Table 6: **Percent distribution of father's and brother's residence in relation to respondent (husband), Bugombe -Kigaraina, 1998.**

	Same form	Other but same village	Different Village	Total	(n)
(a) Father's residence					
	45.7	34.0	20.2	100.0	(94)
(b) Brother's residence					
Poverty Category					
Less Poor	22.7	26.9	50.4	100.0	(119)
Poor	33.1	28.6	38.3	100.0	(133)
Total	28.2	27.8	44.0	100.0	(252)

(Chi-square test: $p < .103$)

6.3.3   Malthusian and Neo-malthusian responses

I   Mathusian response

The Malthusian responses highlight postponement of marriage influenced more by the fact that fertility limitation was not a socially acceptable option at his time, (significant fertility limitation in Europe started in the 1870's, and Malthus was writing at the end of 1790's). The changes in age at marriage were observed by looking at age at first marriage. Comparing age at first marriage and current age in age groups below age 40 and 40 and above and assuming marriage took place by age 20 (for women) and 30 (for men) it seems women are now marrying later (the malthusian postponement of marriage). Among young women in age group below 40, 73.8 percent got married by age 20 compared to 81.9 percent among older women. Although the difference percentage wise looks small, it is highly significant statistically with $p < .0001$. Men on the other hand appear to be marrying earlier than before. 93.4 percent are marrying at ages of 30 and below, compared to 74.3 percent among their elders which is also statistically highly significant with $p < .0001$.

The reasons for this phenomenon could be attributed to aspects of emancipation of women especially over the last 20-30 years or so, with more women attending school and being employed before marriage. For men, the explanation could be the ability to afford establishing a home on their own compared to the past when marrying was in elder's control. For the survey area, the HTV/AIDS epidemic long (since the late 1970's) influenced young men to marry earlier in order to 'stick to one partner'. However they still get married to girls in the vicinity who are older.

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II Neo-malthusian response

Neo-malthusian response is about deliberate fertility regulation and limitation. Table 7 shows cross tabulations of percentage of husbands and wives using methods of fertility regulation by (a) poverty category and (b) number of living children by ever and current use (due to similarity in results only husbands are shown for the latter).

Table 7: **Percent of husbands using methods of fertility regulation by number of living children, Bugombe-Kigarama, 1998.**

(a) Current practice of fertility regulation

	Husbands			Wives			
	Uses	Not use	Total	Uses	Not use	Total	(n)
Less Poor	21.2	78.8	100.0	21.9	78.1	100.0	(146)
Poor	13.2	86.8	100.0	14.4	85.6	100.0	(174)
Total	16.9	83.1	100.0	17.8	82.2	100.0	(320)
Chi-Squ.	Value	DF	Sign.	Chi-Squ.	Value	DF	Sign
Pearson	3.63	1	.05657	Pearson	3.09	1	.07872

(b) Husbands, by number of living children

NO. OF LIVING CHILDREN	EVER USE			CURRENT USE			
	Used	Not used	Total	Used	Not used	Total	(n)
1-2	8.3	91.7	100.0	10.2	89.8	100.0	(108)
3-4	19.7	80.3	100.0	21.1	78.9	100.0	(71)
5-6	26.3	73.7	100.0	26.3	73.7	100.0	(57)
7-9	17.9	82.1	100.0	15.5	84.5	100.0	(84)
Total	16.6	83.4	100.0	16.9	83.1	100.0	(320)
Chi-Squ.	Value	DF	Sign.	Chi-Squ.	Value	DF	Sign.
Pearson	9.83	3	.02007	Pearson	8.10	3	.0400

Total	16.6	83.4	100.0	16.9	83.1	100.0	(32(

Chi-Squ.	Value	DF	Sign.	Chi-Squ.	Value	DF	Sigi
Pearson	9.83	3	.02007	Pearson	8.10	3	.04(

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In the poverty category the findings are highly significant (p < .06, p < .08 for husbands and wives respectively. Panel (a) shows 21.2 percent of current users among the less poor compared to the poor at 13.2 among husbands. Similarly among wives it is 21.9 among less poor compared to 14.4 percent of the poor. The logistic regression of use of methods of fertility regulation, controlling for age and number of living children and confirming the bi-variate analysis shows the less poor are more than one-and-half times more likely to regulate fertility than the poor, with significance of p<.06 (men), p<13 (women). This is the net effect of statistical differences in wealth.

Higher percentage of ever and current users among husbands with more children, highly statistically significant, can be observed. This confirms the observations in Table *2,* i.e., the higher the number of children the less poor a household is and the labour force explanation within Table 5, becomes pertinent. The less poor households were observed to have more children. It is expected that having a good number of children, and being prosperous would lead to more fertility regulation and the converse would be true for the poor who have fewer children. The TDHS 1996 also clearly shows higher contraception among both men and women who have higher numbers of children (Tanzania, 1997: 45-50).

The proven high natalist contraceptors demonstrate more the notion of multiple responses to circumstances. They had bigger households and numbers of children, probably as a result of the .latural fertility process (of a non-contracepting culture) rather than cognitively to enhance their living standards. This however does not exclude cultural rationality such as individuals following cultural norms of building large families. An underlying rationality is advantages of a large family in a labour intensive (demanding) socio-economy. However for a largely traditional peasant society, faced with increasing difficulties of coping with a changing modernising world, multiple responses to prevent standards of living falling come into focus. One such response is limiting fertility observed more among older men and women who on average have accumulated a good number of children. This practice is however far from being universal.

The data show that neo-malthusian response still exists among a few families: at most 22 percent (The TDHS 1996 found 16.1 percent among women and 22.4 among men nationally; in Kagera Region where the survey area is located, it was 27.5 among men and a low of 9.5 among women (Tanzania, ibid.). In reality this could be explained in terms of the desire to have big families which takes parents to older age i.e. women in the 40's when chances of conception are very low. Thus except for the need for child spacing use of contraceptives for limitation becomes irrelevant.

7.0   Conclusions, policy implications and proposals for further research

Observation in not less than four independent surveys shows statistically significant higher proportions of families/households mat are less poor the higher the size. This is true despite education attainment. The study findings thus confirm the same fact although data may have some limitations. Further investigation is thus a necessary step.

The explanation is of two kinds: production conditions and response to population pressure.

Labour availability is crucial in a labour intensive socio-economy. For example, households with higher labour or proportion of household members in labour force ages seem to be less poor. The second explanation is not simply multiple response. This is adaptation over time as both the household/family accumulates in size and times and circumstances change. Observations show that out-migration of siblings from parental homes is being significantly higher among the less poor households. Also the rise in age at marriage among younger women; and limitation of family size, is significantly more prevalent among those with a bigger family or the less poor. These explanations show a normal family life cycle process whereby a household starts small and builds up both in numbers and wealth and negates the neo-malthusian theory of direct fertility limitation.

However this does not mean there has been unchanging relationships even with socio-economic changes. The Kilimanjaro versus Lindi/Mtwara examples show how the transformation of the economy and society from an agrarian traditional set up (Lindi/Mtwara) to one with diversified sources of income and modernisation (Kilimanjaro), emerged. Furthermore the finding of the study show that for a labour intensive socio-economy, less poverty with higher family size is not an anomaly because its survival depends on availability of labour. However, variations of poverty level within both big and smaller households, represented by a minimum of 41 percent in the Bugombe-Kigarama survey and 59 in the TDHS at each size level, points to limitations of the basic finding.

There are no demonstratable findings that small families are better off. The notion of large families being a problem does not feature as a major issue, even from other studies, i.e. TDHS.

The study findings have a number of implications for development. First is its contribution to the debate on the relationship between population growth and development, the population debate, as it is known. The second is what family planning programmes (FP) should be concerned with. For practical purposes FP is of immediate and short-term perspective, while the debate is for log-term population trends.

The Population Establishment's 'Family Planning' (FP) efforts should focus on (a) what people want and (b) spontaneous population trends that are taking place. Helping people achieve their desired number of children, is ipso facto a human right, as enshrined in the United Nations convention, and also one of the cardinal principles of the FP movement. In some cases people expect advantages in a large household, including a good number of children, as the data in the survey demonstrated. Emphasis on small family norm that has yet to demonstrate any clear benefit is thus premature. Creating the environment that positively attracts people to adopt a particular family norm should be emphasized as the best approach to be taken, rather than coercion or preaching only.

The elite have better survival chances and can afford bearing a large number of children. However for most of the African rural peasants who constitute over 80 percent of the population it is certainly different. Information about the reasons for use of FP indicated also by Bongaarts (1992), and the Malawi DHS-based finding by Cohen (2000) show that people want to use

family planning mainly for spacing rather than limiting fertility. This provides an important and independent dimension to our observation on what FP should be doing. The current fertility trends show how FP emphases on family size norm are misguided.

Lower fertility in Africa is inevitable as younger generations desire fewer children. This is as a result of effects of education and economic difficulties that require adequate preparations before marriage. Already significant declines in fertility are observable in Kenya, Zimbabwe, Botswana and South Africa and smaller declines are increasingly being recorded almost everywhere (Caldwell **et al.,** 1992; Cohen, 2000). The government's concern for rapid population seems an exaggeration, especially when Tanzania, at Bucharest, held a scientifically sound view that 'development is the best contraceptive' (Demeny, 1985). The real challenge is to avoid rapid fertility decline, and to avoid ensuing ageing and its grave consequences that industrial countries and Asia are suffering and dread (Peterson, 1999; Ratnasabapathy, 1994; Demeny, 1986). Rapid population growth should not cause much worry. The literature review showed no clear evidence of deleterious effects as exemplified by Boserup (1965), Simon (1981, 1996), Easterlin (1967), World Bank and USAID (Population and Development Review, 1985, 1986).

This however does not negate Simon's (1996, op. cit.) proposition that there are positive effects of population pressure. The scarcity of goods and services and subsequent higher prices associated with population pressure call for further research and development of cheaper alternative sources of technology. Indeed this is the remaining thesis worth of consideration (Ahlburgh, 1998).

A third implication of the findings is the critical question of benefits of the findings to the survey area and society at large

7.1 Benefits of the study
The study results show types of critically needed services. It is not fertility limitation (FP) efforts, because few adopt the methods. Data analysis also showed a variety of household types. For example quite a significant proportion (over 41 percent) of so called big families are in the poor category. A study of these varieties is essential, such as in FP service delivery where each couple had unique needs, different from what can be generalised from averages. An indepth study on various population types in a poverty category is crucial and seems to be the positive beginning. This, however, does not mean denial of FP services to those who need them!

7.2 Areas for further research
A still lingering legitimate question is, why a significant proportions of big families/households, are still in the poor category given the fact that the higher the size of the family/household and number of living children the less the poverty. Is it varying types within the category? This calls for an in-depth study of sub-samples from the survey area, and if possible by other dimensional look at the current data. The economics of patriarchy, where women may be shouldering the upkeep of the household may be one such dimension.

Another important task is the new type of household discovered in the process of sampling in the

field. Over half of households were found to be of one partner (and perhaps even a new relative or non-relative head) rather than the stereotype cases of husband-wife-children. This is probably due to the AIDS epidemic. The variety of socio-economic-cultural ramifications as related to welfare and poverty, and how this affects both the individual family level and at higher levels of society, need further investigation.

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Appendix 1   Construction of a possessions index

The construction of a possessions index goes in the following manner. A type of an item is given a weight or score: the value of the weight/score given is determined by an item's relative standing on level of value. For example a sewing machine is certainly more valuable and shows one having more wealth than a table or chair; so would be a motor vehicle compared to the sewing machine. Simply an arithmetic sum of the weights would give the possessions index: a higher weight value indicates more wealth. There are however important refinements that need consideration for a more proper index.

The value of the weight could be a score, e.g. 1,2,3,.... with any interval. This leaves room for arbitrariness, serious being the differences in the values between items. The problem can be avoided. We prefer what I call a hierarchical 'binary system'. An example explains it better. On the survey questionnaire, a household has (=1) or does not (=0) possess an item. With an item's relative standing as an indicator of level wealth (indeed here it is poverty) still valid, as explained above, an item is practically given a,'position, in the following way. Let us continue with the above items, namely chairs, tables jfewing machines and a car, valued higher in this order by taking positions one to four respectively. Suppose we have two persons, one possessing chairs, tables and a car; die other person. Chairs and a sewing machine. Their possessions indexes would be as follows:

	Chairs	Tables	Sew'ng M	Car	**POSSESSIONS INDEX**
Person No 1	1	1	0	1	1011
Person No 2	1	0	1	0	101

Note: The last position on the index is the position of lowest value.

Person No. 1 is certainly wealthier than No. 2. Their possessions indexes are respectively 1011 and 101. (The arithmetic of combining a person's items can easily be discerned.) The advantage here is that knowing an items position, one can tell what particular items a person possesses.

Grouping can be done into manageable 'Possessions classes': in this study the classes (they are actually a step to arriving at a poverty category, as will be seen later) are poorest, poor and less poor. It can be noted that the word rich is avoided because, as will be seen in the results we are dealing with largely poverty conditions in the survey area.

The items going into the possessions index (with their value position in that order as explained above) are: motor car/lorry, motor cycle, sewing machine, bicycle, radio, lantern, tables, chairs, cattle, and sheep/goats; an additional item going into the index is housing quality (materials making the roof, walls and floor, and number of rooms. Justification of these items for the index was derived from the field, even in the earlier study of Kamuzora and Gwalema (op. cit), apart

from the literature, e.g. Sender and Smith (op. cit). The three 'Possessions classes' (Posclass) are then as follows:

1. **POOREST:** owning a bicycle OR radio and any of the lower value items (including none);

2. **POOR:** owning a radio and a bicycle and any of the lower items;

3. **LESS POOR**: owning a sewing machine OR any of higher, and lower value items.

Housing quality (materials it is made of) was also determined with higher value put to the roof, then walls, and lastly the floor. A qualification was made by adding a crowding (persons per room) dimension. In the TDHS data, further poverty variables, namely type of water source and toilet exist, and were used. Three classes of quality were arrived at: poor housing (basically a thatched roof), improved housing (corrugated iron roof but basically with mud walls and floor), and modern (corrugated iron /tile roof and brick/stone/cement walls and floor).

Combining housing quality and possessions class we produced two 'Poverty Categories' (PAUPE), to facilitate logistic regression analysis. They are as follows.

Poor=l: poor housing (earth walls/floor or thatch roof, or improved housing but with only minimal possessions of up to a bicycle or radio, but not both (others are goats, tables, chairs; for TDHS add unsafe water source, or poor or no toilet facility).
I
Less poor=0: improved housing (cement walls/floor and corrugated iron sheets or tile roof) and possessions beyond that of the poor (i.e. any or all of, electricity, refrigerator, television, motorcycle/car/lorry).

Appendix 2   HOUSEHOLD SIZE, POVERTY INTERVENING VARIABLES BY POVERTY CATEGORY

(from the Tanzania Demographic and Health Survey (TDHS) 1996)

1.0 De jure Household size by Poverty category

Household Size	Poverty Category		Total (%)	(n)
	Less poor (%)	Poor (%)		
1 - 2	33.3	66.7	100.0	(1622)
3 - 4	33.9	66.1	100.0	(2188)
5 - 6	33.8	66.2	100.0	(2077)
7+	40.6	59.4	100.0	(1948)
Total	35.4	64.6	100.0	(7835)

Chi.Squ.	Value	DF	Sign
Pearson	30.37	3	.00000

2.0   POVERTY INTERVENING VARIABLES

HV219 Sex of head of household

Sex	Poverty Category			
	Less poor	Poor	Total	
	%	%	%	(n)
1 Male	37.9	62.1	100.0	(6102)
2 Female	26.7	73.3	100.0	(1733)
Total	35.4	64.6	100.0	(7835)

Chi-Squ.	Value	DF	Sign.
Pearson	73.25	1	.00000

HV025 Type of place of residence

Place	Poverty Category			
	Less poor	Poor	Total	
	%	%	%	(n)
1 Urban	71.5	28.5	100.0	(1883)
2 Rural	24.0	76.0	100.0	(5952)
Total	35.4	64.6	100.0	(7835)

Chi-Squ.	Value	DF	Sign.
Pearson	163.25	1	.00000

HV220: Age of head of household

Age Group	Poverty Category			
	Less poor	Poor	Total	
	%	%	%	(n)
<=35	42.3	57.7	100.0	(2675)
36-45	39.2	60.8	100.0	(1742)
46-55	33.0	67.0	100.0	(1334)
56-65	27.5	72.5	100.0	(1150)
66+	21.6	78.4	100.0	(934)
Total	35.4	64.5	100.0	(7835)

Chi-Squ.	Value	DF	Sign.
Pearson	187.69	4	.00000

HV109$01 Head education attained

Education	Poverty Category			
	Less poor	Poor	Total	
	%	%	%	(n)
None	18.5	81.5	100.0	(2590)
Inco. prim.	29.2	70.8	100.0	(1790)
Comp. prim.	45.1	54.9	100.0	(2764)
Second. +	81.3	18.7	100.0	(611)
Total	35.4	64.5	100.0	(7835)

Chi-Squ.	Value	DF	Sign.
Pearson	1286.7	3	.00000

Appendix 3 Test of correlation between "stock" (possession index) and "flow" (Food security)

By Regression of Food security (SH25) on Poverty category (Paupe4)

KILIMANJARO:

(a) Frequencies

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PAUPE4   Poverty Category

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
Less poor	.00	153	37.3	38.2	38.2
Poor	1.00	248	60.5	61.8	100.0
	.	9	2.2	Missing	
		-----	------	-------	
	Total	410	100.0	100.0	

Valid cases   401   Missing cases   9

- -

SH25   Enough to eat

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
Always enough	1	183	44.6	45.3	45.3
Sometimes not enough	2	205	50.0	50.7	96.0
Frequently not enoug	3	16	3.9	4.0	100.0
	9	6	1.5	Missing	
		------	----	-------	
	Total	410	100.0	100.0	

Valid cases   404   Missing cases   6

(b) *** * * * M U L T I P L E R E G R E S S I O N * * * ***

Listwise Deletion of Missing Data

Equation Number 1   Dependent Variable..   SH25   Enough to eat

Block Number 1. Method: Enter   PAUPE4

Variable(s) Entered on Step Number
   1..   PAUPE4   Poverty Category

Multiple R	.17201
R Square	.02959
Adjusted R Square	.02712
Standard Error	.56083

Analysis of Variance

	DF	Sum of Squares	Mean Square
Regression	1	3.76881	3.76881
Residual	393	123.60841	.31453

F = 11.98252   Signif F = .0006

------------------ Variables in the Equation ------------------

Variable	B	SE B	Beta	T	Sig T
PAUPE4	.201800	.058297	.172011	3.462	.0006
(Constant)	1.466216	.046100		31.805	.0000

End Block Number 1 All requested variables entered.

TANZANIA TOTAL

(a) Frequencies

PAUPE4   Poverty Category

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
	.00	1769	22.2	22.6	22.6
	1.00	6066	76.1	77.4	100.0
	.	134	1.7	Missing	
	Total	7969	100.0	100.0	

Valid cases   7835   Missing cases   134

- -

SH25   Enough to eat

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
Always enough	1	3403	42.7	43.0	43.0
Sometimes not enough	2	3944	49.5	49.9	92.9
Frequently not enoug	3	365	4.6	4.6	97.5
Always not enough	4	192	2.4	2.4	100.0
DK	8	2	.0	.0	100.0
	9	63	.8	Missing	
	Total	7969	100.0	100.0	

Valid cases   7906   Missing cases   63

(b)   *** * * * M U L T I P L E   R E G R E S S I O N * * * ***

Listwise Deletion of Missing Data

Equation Number 1   Dependent Variable..   SH25   Enough to eat

Block Number 1. Method: Enter   PAUPE4

Variable(s) Entered on Step Number
   1..   PAUPE4   Poverty Category

Multiple R   .17201
R Square   .02959
Adjusted R Square   .02712
Standard Error   .56083

Analysis of Variance
                     DF   Sum of Squares   Mean Square
Regression   1   3.76881   3.76881
Residual   393   123.60841   .31453

F =   11.98252   Signif F =   .0006

------------------ Variables in the Equation ------------------

Variable	B	SE B	Beta	T	Sig T
PAUPE4	.201800	.058297	.172011	3.462	.0006
(Constant)	1.466216	.046100		31.805	.0000

End Block Number 1 All requested variables entered.

(b)   * * * *   M U L T I P L E   R E G R E S S I O N   * * * *

Listwise Deletion of Missing Data

Equation Number 1   Dependent Variable..   SH25   Enough to eat

Block Number 1. Method: Enter   PAUPE4

Variable(s) Entered on Step Number
   1..   PAUPE4   Poverty Category

Multiple R   .16940
R Square   .02870
Adjusted R Square   .02857
Standard Error   .67432

Analysis of Variance
                      DF   Sum of Squares   Mean Square
Regression   1   104.38383   104.38383
Residual   7770   3533.12364   .45471

F =   229.55956   Signif F = .0000

------------------ Variables in the Equation ------------------

Variable   B   SE B   Beta   T Sig T

PAUPE4   .278823   .018403   .169400   15.151   .0000
(Constant)   1.447277   .016231   89.167   .0000

End Block Number   1   All requested variables entered.