

Determinants of Poverty on Household Characteristics in Zanzibar: A logistic Regression Model

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Abstract

The two succession of Zanzibar Household Budget Survey (ZHBS) in 2004/2005 and 2009/2010 use head count to address poverty as the base of all analysis with several social and economic variables. This study attempts to use logistic regression to venture ratio of the probability of occurrence of poverty in Zanzibar with social dimension. The study reveals that social demographic dimensions are important in explaining poverty and that the likelihood of poverty significant relates to household size, household head, and basic education (primary and secondary). Furthermore, the study exposes that all district in Pemba are on high risk of being enter into poverty.

Key words: Zanzibar, poverty, households, determinant of poverty, logistic regression

Introduction

Perhaps the most striking fact about poverty in World is that the African countries has by a considerable margin the highest rate of poverty among all the developing countries. Poverty in Africa associated with lower levels of key assets, including labour, education, physical assets, social capital and infrastructure characteristics. Geographic location and household size are also found to be important correlates of poverty in Africa. A vast majority of people in Africa live in extreme poverty. In line with global trends, it is estimated that the proportion of people living in poverty in South Africa which is the large economy in Africa has not changed significantly between 1996 and 2001 (Poswa, 2008). In fact, households living in poverty and the gap between rich and poor have widened. The growth of poverty gap has shown to grow faster than the growth of the economy, which signposts that poor households have not shared in the benefits of the economic growth (Schwabe, 2004).

Zanzibar being Small Island with small economy in peripheral of Africa show no difference compared with other African countries. The analysis of 2009/2010 Zanzibar Household Budget Survey (ZHBS) is analogous to that of 2004/ 2005 ZHBS, where both surveys exploiting counting of poverty. The profile of poverty and inequality were carryout based on headcount ratio with demographic dimension. All cross tabulation associate poverty on one hand and other background variables. Toward empirical analysis, this paper attempt to examine determinant of household poverty using quantities and categorically variables. A multivariate and a logistic regression model were employed to the extended poverty analysis profile reported by House Budget Survey of 2009/10.

Literature Review

Poverty defined by number of economists as a lack of essential items, such as food, clothing, water, and shelter needed for proper living. World Summit for Social Development (2005) defined poverty as a condition characterized by severe deprivation of basic human needs, including food, safe drinking water, sanitation facilities, health, shelter, education and information. In Africa most countries has taken number of measures in poverty reduction through economic growth, employment creation and the provision of basic social services since its independence. Despite the basic commitment to fight poverty to remain strong, efforts taken have not, for the most part, yielded the expected results.

In Zanzibar, for example, there is no significant change of people living in poverty between the two household budget survey 2004/05 and 2009/10. Indeed, there is widened gap between the rich and poor. The situation is almost the same across the whole of Africa where households' poverty influenced by certain characteristics like education, household head. Maitra (2002) analyzed the effects of household characteristics on poverty and living standards in South Africa and found that, the sex of the household head, the education attainment of the household head, ethnicity and region of residence have significant effects on both the poverty status and standard of living of the household.

Empirical studies suggests that rural households are much affected by poverty compared with urban. Bogale et al., (2005) inspected on determinants of poverty in rural Ethiopia and the findings evidenced that, about 40 percent of the sample households live below poverty line with an average poverty gap of 0.047. The binary logit

estimates evidenced factors behind the persistence of poverty to be strongly linked with entitlement failures understood as lack of household resources endowments to crucial assets such as land, human capital and oxen. Rural poverty on the other hand, much contributed by the lack of proper education attainment of the farmers and improper participation of the farmers in government programs (El-Osta and Morehart (2008).

Oyakale, Adepoju and Balogun (2012) analysed the poverty status of rural households in Ogun Waterside Local Government Area of Ogun State. Data were collected from 125 households using multistage sampling procedure. Descriptive and Probit regression analytical approaches were used for data analysis. Results show that 28.8 percent of the households were poor and poverty was perceived to be driven by unemployment, low-investment and neglect by government. Probit results revealed that having farming as primary occupation and household size significantly increased poverty ($p < 0.10$), while amount of credit/loan obtained, educational attainments and monthly expenditure of household significantly reduced it ($p < 0.10$). To alleviate rural poverty, the study concluded that households should have adequate access to affordable and easily accessible credit facilities, among others.

Strategies aimed to poverty reduction need to clearly identify factors that are strongly associated with poverty. This is crucial as poverty contributed with a number of factors with the different significant. Geda et al., (2005) evidenced that poverty is strongly associated with the level of education, household size and engagement in agricultural activities.

Alem (2013) uses five rounds of panel data to investigate the persistence of poverty in urban Ethiopia with a particular focus on the role of intra-household heterogeneity in occupations. The use of dynamic probit and system GMM regression results suggest that international remittances and labour market status of non-head household members are important determinants of households' poverty status. Results also show that controlling for these variables and the initial conditions problem encountered in non-linear dynamic probit models reduces the magnitude of estimated poverty persistence significantly for urban Ethiopia.

Literature considered head of household as an important factor in examining the household poverty as in many developing countries social and cultural motives restrict women's access to work and education, and hence women do not participate in labour market as freely as men do (Dreze and Sen 1995, Dunlop and Velkoff 1999) and thus, the female headed households regarded to be poor compared with male headed household. Several reasons mentioned to cause this situation. First, female headed households in general have more dependents and thus have higher non-workers to workers ratio compared to other households. Second, female heads typically work for lower wages and have less access to assets and productive resources compared to men owing to gender bias against women. Third, women typically bear the burden of household chores that result in time and mobility constraints compared to male-heads (Buvinic and Gupta, 1997). The fact that female heads must shoulder the burden of economic support and household chores leaves them with lesser time for leisure compared to male heads. This association between leisure-work trade-off also leads to intergenerational transmission of poverty in female-headed households. Buvinic and Gupta (1997) provide evidence that in Chile, policies targeting female-headed households in pursuit of reducing poverty have been an efficient way of reducing poverty.

Barros et al., (1997) suggest that female-headed households have worse social, economic and demographic features compared to male-headed counterparts and are thus more likely to be poor. They provide evidence that female-headed households in Brazil tend to have lower household income compared to other households because of lower average earnings of the female head. Senada and Sergio (2007) investigate whether female-headed households are more vulnerable to poverty in Bosnia and Herzegovina. Using yearly per capita consumption expenditure measure of poverty (adjusted for regional differences in prices), they do not find any support for this claim.

Rajaram (2009) estimates whether female-headed households are poorer than their male-headed counterparts, using household data from the Indian National Family Health Survey (NFHS) for the year 2005-06. Employing probit and logit estimations, the results from the analysis provide evidence that the relationship between female-headed households and poverty depends on the choice of poverty measure. The results suggest that poverty measures based on the housing condition and the wealth indices show that female-headed households are less poor than male-headed households. However, based on the standard of living index measure of poverty, female-headed households are marginally poorer than their male-headed counterparts.

Data

The data used for the study based on a micro level data collected in 2009/2010 ZHBS by the Office of Chief Government Statistician (OCGS), Zanzibar. The survey covered 4293 households statistically distributed in several districts and urban -rural of Zanzibar.

Two stages sampling method was carry out, in early stage the 179 Enumeration Areas (EAs) were selected and in later stage sample was a selection of households, The Primary Sampling Units (PSUs) derived from 2002 Population and Housing Census and 2010 House Budgets Survey.

Methodology

Several study have use different model and different indigenous variables, some use categorical data models while some use ordinary least square and some employ both (Sikendar, 2008). This paper use a binomial Logit or Probit regression model since it is an appropriate technique to observe the likelihood of a household for being poor or a risk of the household on entering or escaping poverty. The paper use a module to analyze probability - likelihood of a household being poor in relation to same independent variables

$$\text{logit}(p) = \ln\left(\frac{p}{1-p}\right) = \beta_0 + \beta_1X_1 + \beta_2X_2 + \beta_3X_3 + \beta_4X_4 + \beta_5X_5 + \dots + \beta_{15}X_{15} + U_i \quad (1)$$

Where $X_1 \dots X_{15}$ were the predictors variable; household size, gender of household head, type of residence (urban=1), depended status of house head, employed, farming, fishing administrative location (nine districts relative to Urban district Unguja) respectively and p is denoted as likelihood of a household being poor=1, and U_i is the error term.

Abdul-Hakim, Ismail and Abdul-Razak (2010) in their model include age, household size, dependent, remittance, and physical capital, social capital and number of years spent in education where by Achial, Wangombe and Khadioli (2012) they use age of household, size of household, educational level of the household head, type of residence (rural or urban), ethnicity and religion as the predictor and p denoted the probability that the household was poor as dependent variable for their modal.

Table 1. Determinants of poverty used in the modules and their values

Variables	Description	Definition
Dependent variable		
Poor (Module 2)	Poverty	1=Household being poor, 0= otherwise
Independent Variables		
Hhsize	Size of Household	Continuous
AgeH	Age of household head	Continuous
GenderH	Gender of household head	1= Male 0= Female
Urb_rur	Type of residence	1=Urban, 0=Rural
Noeduc	No education	1=No education, 0 = otherwise
Primary	Primary	1=Primary, 0 = otherwise
Secondary	Secondary and Post	1=Secondary, 0 = otherwise
Higher	Higher Education	1=Higher education, 0 = otherwise
Depend	Dependence Status	1= Dependent, 0=Nondependent
Employed	Employed	1= Employed, 0 = otherwise
Farming	Farming	1=Farming, 0 = otherwise
Fishing	Fishing	1= Fishing, 0 = otherwise
District1	North A	1= North A, 0 =otherwise

District2	North B	1= North B, 0 =otherwise
District3	Central Unguja	1= Central Unguja, 0 =otherwise
District4	South Unguja	1= South Unguja, 0 =otherwise
District5	West	1= West, 0 =otherwise
District6	Town Unguja	1= Town, 0 =otherwise
District7	Wete	1= Wete, 0 =otherwise
District8	Micheweni	1= Micheweni, 0 =otherwise
District9	Chake	1= Chake, 0 =otherwise
District10	Mkoani	1= Mkoani, 0 =otherwise

Results and findings

Table 2 and 3 shows the results of logistic regression for the model 1. The results reveals that household size, administrative location (urban), level of education primary and secondary and all Pemba districts are statistically significant in explaining the probability (likelihood) of household being poor. Other variables such as Household head, dependent status, higher education and Administrative location in Unguja districts found to be statistical insignificant.

Table 2: Estimated Coefficients/Parameters

	Odds Ratio	Std. Err.	Z	P> z	[95% Conf. Interval]	
Household size	1.394788	0.030083	15.43	0.0000	1.337055	1.455013
Household Head	1.127866	0.173228	0.78	0.4330	0.834683	1.524028
Urban	0.617869	0.107101	-2.78	0.0050	0.439896	0.867848
Dependent Status	1.04741	0.179793	0.27	0.7870	0.748177	1.466323
Primary	0.583239	0.085481	-3.68	0.0000	0.437615	0.777322
Secondary	0.402036	0.070532	-5.19	0.0000	0.285058	0.567018
Higher	0.592617	0.217887	-1.42	0.1550	0.28828	1.218246
Employed	0.697013	0.164523	-1.53	0.1260	0.438857	1.107026
Fishing	0.718992	0.209897	-1.13	0.2580	0.405724	1.274141
Farming	0.888616	0.196982	-0.53	0.5940	0.575474	1.372152
North A Unguja	1.346213	0.498196	0.80	0.4220	0.65179	2.780482
North B Unguja	1.091156	0.423734	0.22	0.8220	0.509725	2.335814
Central Unguja	0.945869	0.373456	-0.14	0.8880	0.436267	2.050736
South Unguja	0.683037	0.312068	-0.83	0.4040	0.278962	1.672412
West Unguja	0.597303	0.237071	-1.30	0.1940	0.274379	1.300284
Wete	3.473287	1.150381	3.76	0.0000	1.814745	6.647611
Micheweni	2.930963	1.03129	3.06	0.0020	1.470639	5.841368
Chake Chake	2.178906	0.737846	2.30	0.0210	1.122005	4.231379
Mkoani	2.175464	0.76208	2.22	0.0270	1.094889	4.322486

Number of obs = 4293
LR chi2 (19) = 509.10
Prob > chi2 = 0.0000
Pseudo R2 = 0.1930
Log likelihood = -1064.1075

Table 3: Logistics Estimate Determinant of Poverty in Zanzibar

Parameter	Coefficients.	Std. Err.	Z	P> z	[95% Conf. Interval]	
Household size	0.3327423	0.021568	15.43	0.0000*	0.29047	0.375015
Household Head	0.1203269	0.153589	0.78	0.4330	-0.1807	0.421357
Urban	-0.4814781	0.17334	-2.78	0.0050*	-0.82122	-0.82122
dependent Status	0.0463207	0.171655	0.27	0.7870	-0.29012	0.382758
Primary	-0.5391575	0.146563	-3.68	0.0000*	-0.82641	-0.82641
Secondary	-0.9112133	0.175436	-5.19	0.0000*	-1.25506	-1.25506
Higher	-0.5232063	0.367669	-1.42	0.1550	-1.24383	0.197412
Employed	-0.3609518	0.23604	-1.53	0.1260	-0.82358	0.101677
Fishing	-0.3299054	0.291933	-1.13	0.2580	-0.90208	0.242273
Farming	-0.1180902	0.221673	-0.53	0.5940	-0.55256	0.31638
North A Unguja	0.2972957	0.370072	0.8	0.4220	-0.42803	1.022624
North B Unguja	0.0872378	0.388335	0.22	0.8220	-0.67388	0.84836
Central Unguja	-0.0556512	0.394829	-0.14	0.8880	-0.8295	0.718199
South Unguja	-0.3812059	0.456882	-0.83	0.4040	-1.27668	0.514267
West Unguja	-0.5153313	0.396902	-1.3	0.1940	-1.29325	0.262583
Wete	1.245101	0.331208	3.76	0.0000*	0.595945	1.894258
Micheweni	1.075331	0.351861	3.06	0.0020*	0.385697	1.764965
Chake	0.7788227	0.338631	2.3	0.0210*	0.115117	1.442528
Mkoani	0.7772419	0.350307	2.22	0.0270*	0.090653	1.463831
Constant	-4.132751	0.40353	-10.24	0.0000	-4.92365	-4.92365

Size of household found to have positive effect on household being poor. For every one-member increase in the household the probability of household being poor will increase, that is the odd of being poor is expected to increase by 39%. The result also show that urban is important in explaining the likelihood of being poor, the odd ratio ($0.62 < 1$) show that the probability of being poor has less pressure in urban when compared with rural and this tells us the odds of being poor in urban area is decreasing by 62% or expected to change by 0.617869 factors. The result on the family size reveal that family size is positive related to likelihood of household being poor and therefore consistent with that of Abdul-Razak (2010). The large family size characterized with larger number of dependent against few bread earners, and thus, increase of family size does not in line with the increase of income that resulting in increasing the chance of the family entering into poverty status.

In looking on level of education in relation to house head with head without education, the results shows that the likelihood of being poor is decreases by 0.583239 factor when house head attained primary education and decrease by 0.402036 when proceed to secondary education. This implies that, education is the important factors in reducing the impact of poverty at the household level. This result is consistent with that of Geda et al., (2005) who evidenced that poverty is strongly associated with the level of education and Maitra (2002) who evidenced that the education attainment of the household head has a significant impact in poverty status and standard of living of the household. The study reveals that education of head of household is an important factor on escaping poverty. This emphasize the need of putting more efforts on long-term cycle of empowering Zanzibar population with relevant knowledge and study skills and utilizing the surrounding environment in return of social and economic benefit. Large part of Zanzibar characterized by coral, small favorable agriculture area and surrounded by sea, and education should focus on what should have done on increasing household production both at micro and macro level.

Furthermore, the results shows the relative risks of being poor for the household located in four districts of Pemba in comparing with household located in Unguja Town are important factors in determining the status of poverty. This implies that, regions have a significant impact in determining the household poverty. The result consistent with Maitra (2002) who demonstrated that ethnicity and region of residence have significant impact on both the poverty status and standard of living of the household in South Africa. The district of Wete is significant at a 1% level and has positive relationship which means that the likelihood of being poor in this district is 3.5 larger than Town district in Unguja. Micheweni come next on likelihood of being poor for the

household reside in the area by three (2.9) times higher than household located in Town area in Unguja, this is supported by showing statistically significant at a 99%.

The likelihood of being poor in North Pemba (Wete and Micheweni) seem to have similarity when both districts compared with Town Unguja, both districts are significant at a 5% level and positive related on being poor. This hint that the likelihood of household in these two districts being poor are (2.2) times higher than likelihood of being poor in Town district in Unguja. The rest of five districts are not significant but the likelihood is lower than those districts in Pemba.

The analysis suggests that the Town district in Unguja has significant number of economic activities and reasonable number of market force for SME's to feverish, but disadvantage of unnoticed morbidity of population from rest of districts and other region. This could result with large disparity of income if poverty reduction to other districts is not properly addressed. This result is consistent with Bogale et al., (2005) that evidenced that 40% of the households living in rural were living below poverty line. Empirical analysis suggests that urban households are in low risk of entering into poverty than those in rural area. Urban characterized with density population but with abundant opportunities exposed to household's member, starting from education, health, investment, information exposure etc.

Moreover, the model result confirms that gender of the household head is not determinate factor for household being on risk of poverty in Zanzibar as shown to be insignificant. This result is consistent with that of Senada and Sergio (2007) who investigated whether female-headed households are more vulnerable to poverty in Bosnia and Herzegovina using yearly per capita consumption expenditure measure of poverty (adjusted for regional differences in prices), and do not find any support for this claim.

Conclusion

This paper is the first of its' kind to use examine the determinants of households characteristics in Zanzibar using two Household Budget Surveys (2004/05 and 2009/10) and using logistic regression. The results provide evidence that household size, location (urban or rural), education and region in which households situated are significant factors in determining the household poverty level. The results also evidence that, the head of households and the nature of the work are insignificant in determining the household poverty level. This requires policy makers to first identify poor people based on more than just one measure of poverty.

Differences in poverty status among female and male-headed households are not statistically significant and do not warrant antipoverty policies specifically focused on female-headed households. Overall, the results do not provide evidence to support the claim that female-headed households are any poorer than male-headed households and that they require special assistance. However, there is a need for the Government to create more social and economic opportunities to rural area for rural households. Zanzibar as small islands with very high morbidity between its districts, Unguja districts are in favor on likelihood on escape on poverty to administrative capital of Town Unguja. The situation is difference from Pemba districts where empirical evidence reveals than all districts in Pemba are in relative conspicuous likelihood of entering into poverty. It is high time now for the Government to implement poverty eradication strategies at District Centered Approach (DCA) prioritized on increasing production, agro and marine processing for internal and external consumption.

Consider this findings where all districts use same poverty line per 2010 HBS it is crucial considering to having different poverty line based on districts or at least in region as each districts have its environmental capital (in terms land, coral or non-coral). This empirical analysis presented on this paper intended to help policy and decision maker to see clearly the effect of household social dimension on likelihood of poverty to head of household. Where future research could center in explaining an attention people empowerment toward poverty eradication, by determine commutation and decision participation.

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Source	SS	df	MS	
Model	533.374497	19	28.0723419	Number of obs = 4293
Residual	850.812133	4273	.199113534	F(19, 4273) = 140.99
Total	1384.18663	4292	.322503874	Prob > F = 0.0000
				R-squared = 0.3853
				Adj R-squared = 0.3826
				Root MSE = .44622

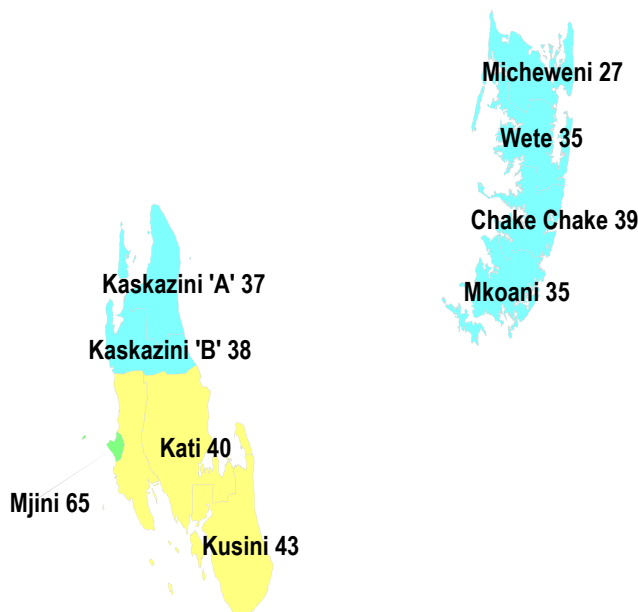
Inpce	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]
hhsiz	-.1017159	.0026214	-38.80	0.000	-.1068553 -.0965765
MaleHeadHld	.0205999	.0182544	1.13	0.259	-.0151883 .0563881
Urban	.1404748	.0210136	6.68	0.000	.0992772 .1816724
dependant	-.0406267	.0225326	-1.80	0.071	-.0848024 .003549
Primary	.0903989	.0194497	4.65	0.000	.0522675 .1285304
Secondarry	.1505136	.0211072	7.13	0.000	.1091325 .1918947
Higher	.237853	.0455919	5.22	0.000	.1484692 .3272369
Employed	.0205492	.0281443	0.73	0.465	-.0346283 .0757267
Fishing	-.07551	.0357528	-2.11	0.035	-.145604 -.0054159
Farming	-.0274191	.0277498	-0.99	0.323	-.0818231 .026985
District1	-.3595151	.0374551	-9.60	0.000	-.4329466 -.2860836
District2	-.3576375	.0370791	-9.65	0.000	-.4303318 -.2849431
District3	-.3557887	.0373825	-9.52	0.000	-.4290778 -.2824997
District4	-.4268603	.0357255	-11.95	0.000	-.4969008 -.3568198
District5	-.1204509	.032866	-3.66	0.000	-.1848853 -.0560164
District7	-.4808975	.0338439	-14.21	0.000	-.5472492 -.4145459
District8	-.6297857	.0375819	-16.76	0.000	-.7034658 -.5561056
District9	-.3558486	.0338744	-10.50	0.000	-.42226 -.2894372
District10	-.3476859	.0356184	-9.76	0.000	-.4175165 -.2778554
_cons	11.30003	.0419079	269.64	0.000	11.21786 11.38219

Logistic regression

Log likelihood = -1064.1075

Number of obs = 4293
 LR chi2(19) = 509.10
 Prob > chi2 = 0.0000
 Pseudo R2 = 0.1930

poor	Odds Ratio	Std. Err.	z	P> z	[95% Conf. Interval]
hhsiz	1.394788	.030083	15.43	0.000	1.337055 1.455013
MaleHeadHld	1.127866	.1732282	0.78	0.433	.8346834 1.524028
Urban	.6178694	.1071013	-2.78	0.005	.4398956 .8678482
dependant	1.04741	.1797929	0.27	0.787	.7481765 1.466323
Primary	.5832394	.0854811	-3.68	0.000	.4376154 .7773223
Secondary	.4020361	.0705317	-5.19	0.000	.2850581 .5670179
Higher	.5926174	.2178871	-1.42	0.155	.2882795 1.218246
Employed	.6970126	.1645225	-1.53	0.126	.4388574 1.107026
Fishing	.7189917	.2098973	-1.13	0.258	.4057235 1.274141
Farming	.8886159	.1969818	-0.53	0.594	.5754744 1.372152
District1	1.346213	.4981963	0.80	0.422	.6517901 2.780482
District2	1.091156	.4237341	0.22	0.822	.5097246 2.335814
District3	.945869	.3734562	-0.14	0.888	.4362669 2.050736
District4	.6830372	.3120675	-0.83	0.404	.2789624 1.672412
District5	.5973027	.2370707	-1.30	0.194	.2743789 1.300284
District7	3.473287	1.150381	3.76	0.000	1.814745 6.647611
District8	2.930963	1.03129	3.06	0.002	1.470639 5.841368
District9	2.178906	.7378458	2.30	0.021	1.122005 4.231379
District10	2.175464	.7620798	2.22	0.027	1.094889 4.322486



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