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Poverty Decomposition by Households' Location among Fisher-Folks in South-Western Nigeria

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Abstract: Poverty encompasses deprivation in multiple welfare dimensions but only few poverty studies in Nigeria have put this in consideration, thus, this study investigates the determinants of multi-dimensional poverty among fishing households in south-western Nigeria. Data were obtained from 448 fishing households using structured questionnaire. Three coastal States (Ogun, Ondo and Lagos) and three Local Government Areas (LGAs) per State, resulting in 100 communities proportionally drawn from the study area. Socio-demographic data were obtained on thirteen identified welfare indicators. The Alkire-Foster's dimension-adjusted poverty measure were computed (and compared with the uni-dimensional Foster-Greer-Thorbecke measure) while determinants of household multidimensional poverty were estimated using the logit regression model. A multi-dimensional poverty cut-off value of 8 was obtained out of the 13 indicators directly linked to welfare status of the households. Poverty headcount ratio was 0.6 while dimension-adjusted poverty incidence, depth and severity were 34.2%, 16.0% and 7.6%, respectively. Being fully engaged in fishing (0.13), using dugout canoes (0.11), and living on-shores (3.13) increased the probability of households' multi-dimensional poverty while high educational attainment (-0.005), income (- 0.14) and land size (-0.11) reduced it. Engaging mainly in onshore activities (p=0.01), human capital endowment (p=0.10) and belonging to polygamous family contributed significantly (p = 0.01) to inequality in the poverty rates between the two coastal sub-population groups. Improved access to formal education and use of motorised canoes were recommended for reducing the poverty incidence among the fishing households.

Keywords: Welfare dimensions; fishing households; multi-dimensional poverty

JEL Classification: I32; H31; Q22

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1. Introduction

Poverty among the resource-poor has been conceptualized to reflect a state of deprivation which is manifested in illiteracy, lack of access to water, poor housing and declining purchasing power (Adepoju, 2001). Very often, fisher households in the coastal areas do not find adequate and appropriate shelters; quality food and drinking water; adequate and hygienic sanitation; privacy for women, particularly for the lactating mothers and adolescent women (Sardar et al., 2008). Over 20 millions of such riverine households stretching over some 800 kilometers along the coastline in Nigeria are exposed to risky situations occasioned by devastating natural and environmental hazards (such as erosions, floods and building collapses), among others, which have perpetually subjected them to a situation of homelessness, hopelessness, reduced welfare status and abject poverty (Siyanbade, 2006). Due to the exposure to poor and infectious environment, poverty becomes most prevalent among households in riverine areas. For instance, the studies of Bhutta et al. (2014) and Murray et al. (2014) observed among other health-related issues, that infections remain a major global health concern, particularly in the developing world where the human immunodeficiency virus and the acquired immune deficiency syndrome (HIV/AIDS), viral hepatitis, tuberculosis and malaria, still kill millions of people around the globe every year.

Wherever they exist, coastal regions are mostly affected by the scourge of poverty with lives and property at the risk of flooding and erosion and the situation can make even a riverine community within an urban metropolis far worse than rural areas (Sardar et al., 2008). The situation in the Nigeria coastal region is not in any way different as the consequences of crude-oil exploration produced a shock in the local economy that results in decreasing economic activities (both onshore and offshore) leading to decreasing crop outputs and fish catch, with an attendant increase in poverty level and welfare loss (Maduagwu, 2000). Oyekale (2010) in a poverty study across rural Nigeria reported that in the coastal south-southern zone of the country, relative poverty was particularly high in Akwa Ibom (5.06%); Bayelsa (1.18%); Cross River (2.57%); Delta (3.32%); and Rivers (2.84%) among other southern States. This variation in the poverty level within a geographic zone underscores the need to pay particular attention to riverine communities when designing national intervention programmes to alleviate poverty.

The poor attitude of artisanal fishermen towards adoption of appropriate fishing technology in Nigeria has been reported in literature (e.g, Oladele & Adekoya, 2006; Cinemre et al., 2006) and this has considerable effect on their catch level and hence, on their income and welfare status. This study had estimated the determinants of multidimensional poverty and described the sources of disparities in multidimensional poverty incidence among core-coastal and off-shore fishing households in south-western Nigeria.

2. Materials and Methods

2.1. Area of Study

This study was conducted in the coastal area of Southwest geo-political zone of Nigeria characterized by the existence of lagoon, the Atlantic ocean and brackish water. The Southwestern zone lies within Latitude 5.45^0N and 8.15^0N and Longitude 3^0E and 6^0E, with a temperature range of 27^0C and 32^0C. The coastal bed of Southwest geo-political zone of Nigeria has artisanal and commercial capture fishing activities as the predominant occupation among the settlers, as well as homestead culture fishing that is undertaken by some households but to a smaller extent.

2.2. Sampling Techniques, Sample Size and Data Collection

Primary data were obtained with the aid of structured questionnaires administered on the household head in a multi-stage sampling procedure. Information was obtained on factors bordering on the welfare status of the riverine households. Three coastal states and Local Government Areas (LGAs) in the southwestern zone of Nigeria were covered in the study, namely: Ogun (Ogun waterside, Ipokia and Ijebu-East); Ondo (Ilaje, Ese-Odo & Irele); and Lagos (Epe, Badagry & Ibeju/Lekki). Subsequently, 100 riverine communities; 5 households (HHs) and 500 households (out of which 448 were useful) were proportionally selected for the study.

2.3. Analytical Techniques

2.3.1. Multi-dimensional Poverty Measures

In order to profile poverty of the fishing households, multi-dimensional poverty measures were computed, following Bourguignon and Chakravarty (2003), as used by Alkire and Foster (2007) and Alkire and Santos (2010). The multi-dimensional poverty measures are defined as:

$$M_\alpha = \mu\left(g^\alpha(k)\right) \text{ for } \alpha \geq 0 \quad (1)$$

where α is a poverty aversion parameter which takes on values 0, 1, or 2. The general form of the dimension-adjusted poverty index (MPI) is denoted by $M_\alpha(y;z)$, where *y* represents the household's level of achievement in any given indicator, and z represents the dimension-specific cut-off for the indicator.

In another expression, $$M_\alpha = \frac{\left|g^\alpha(k)\right|}{nd} \quad (2)$$

where d represents the number of dimensions and n is the total number of sampled households. The variable g^α is an $n \times d$ matrix whose ij^{th} entry is 1 when household

i is deprived in the j^{th} dimension, and 0 otherwise, with i^{th} row vector g_i^{α} being the household *i*'s *deprivation vector*. In this case, M_{α} is defined as the quotient of the sum of the α powers of the normalized gaps of the poor and the highest possible value for this sum.

When $\alpha = 0$, $$M_0 = \mu\left(g^0(k)\right) \tag{3}$$

The notation μ portrays M_0 as the mean of the matrix $g^0(k)$,

that is, $$M_0 = \frac{\left|g^0(k)\right|}{nd} \tag{4}$$

where *n* and *d* are number of sampled observation and dimensions, respectively.

M_0 is a product of two quantities, the deprivation share *A* given as: $A = |c(k)|/(qd)$, and *H*, incidence of multi-dimensional poverty, $H = \frac{q}{n}$ Thus,

$$M_o = HA = \mu(g^0(k)) \tag{5}$$

where $q = q(y;z)$ is the number of poor households in the set Z_k, and hence the number of households identified to be multi-dimensionally deprived based on the dual cutoff criterion, ρ_k. The notation $c_i(k)/d$ represents the fraction of weighted indicators in which the poor household *i* is deprived given the cut-off *k*. M_0 is thus the dimension-adjusted headcount ratio. When $\alpha = 1$, the dimension-adjusted poverty gap, $M_1(y;z)$ results, defined as:

$$M_1 = HAG = \mu(g^1(k)) \tag{6}$$

G = *average poverty gap* across dimensions in which the poor households are deprived, given as $$G = \left|g^1(k)\right| / \left|g^0(k)\right| \tag{7}$$

where $g^1(k)$ is a censored matrix defined by $g_{ij}^1(k) = 0$ if $c_i < k$ and $g_{ij}^1(k) = g_{ij}^1$ if $c_i \geq k$, so that $g^1(k)$ only includes the deprivations of the poor. When $\alpha = 2$, the dimension-adjusted poverty severity $M_2(y;z)$ results, expressed as

$$M_2 = HAS = \mu(g^2(k)) \tag{8}$$

where S = average severity of deprivation across all dimensions in which the poor households are deprived: $S = \left|g^2(k)\right| / \left|g^0(k)\right|$ (9)

For any defined increase in deprivation, the M_2 measure registers a greater impact the larger the initial level of deprivation. Indeed, $M_2 = (M_1)^2 + V$, where V is the variance among all normalized gaps given as

$$V = \sum_i \sum_j \left((\mu(g^{'}) - g_{ij}^{'}\right)^2 / nd \quad (10)$$

In terms of the deprivation vector *c*, $M_2 = (M_1)^2\left[1 + C^2\right]$, where $C^2 = V/(\mu(g^{'}))^2$ (11)

2.3.2. Determinants of Households' Multi-dimensional Poverty Incidence

To estimate the probability of households being multi-dimensionally poor in the study area, the logit regression model was adopted, generally assuming the form:

$$g(P_i) = \frac{Log(P_i)}{1 - P_i} = \sum_{l=1}^{L} X_l \delta_l + \sum_{m=1}^{M} \sum_{k_m=2}^{K_m} D_{mk_m} \beta_{mk_m} \quad (12)$$

where:

$$P_i = P\left(Y_i = 1 \middle/ X_l = 1 \middle/ D_{mk_m}\right) = \frac{\exp.\left(\sum_{l=1}^{L} X_l \delta_l + \sum_{m=1}^{M} \sum_{k_m=2}^{K_m} D_{mk_m} \beta_{mk_m}\right)}{1 + \exp\left(\sum_{l=1}^{L} X_l \delta_l + \sum_{m=1}^{M} \sum_{k_m=2}^{K_m} D_{mk_m} \beta_{mk_m}\right)} \quad (13)$$

which, following Yun (2005) is transformed into a linearised form expressed in the form:

$$P = F\left\{\alpha + \sum_{l=1}^{L} X_l \hat{\delta}_l + \sum_{m=1}^{M} \sum_{k_m=2}^{K_m} D_{mk_m} \hat{\beta}_{mk_m}\right\} \quad (14)$$

P is an unobservable latent variable for a household being poor, taking on the observed binary value 1 if the household is poor; and 0 otherwise. The probability that *P* assumes value 1 is given as

$$\Pr ob.(P = 1) = \frac{\varepsilon^{\sigma i} + \delta_l^{X_l} \beta_{mk_m}^{D_{mk_m}}}{1 + \varepsilon^{\sigma_i + \delta_l X_l + \beta_{mk_m} D_{mk_m}}} \quad (15)$$

α represents the effect of unobserved factors in the model. $\hat{\delta}_l$ and $\hat{\beta}_{mk_k}$ are parameters to be estimated. β_i are the parameters to be estimated and ℓ_i the independently distributed error term. $X_i ... X_n$ represent vector of socioeconomic and demographic variables hypothesized to determine the level of household multi-dimensional deprivation, namely:

AGE = Age of the household head (years)

AGESQ = Squared age of the household head (years)

GENDER = Gender of the household head where (female = 1; 0 otherwise)

HHSIZE = Household size (number)

DEPRAT = Dependency ratio (ratio of non-working to all members of the household)

FAMTYP = Family type (polygamous = 1; 0 otherwise)

HHINC = Total monthly household income (₦)

EXTREM = Total monthly external remittances to the household (₦)

EMPFIS = Employment status of household head in fishing (fulltime = 1; 0 otherwise)

SPCHWK = Spouse engagement in fishing activities (yes =1; 0 otherwise)

CANOES = Type of canoe used by the household (dugout canoe = 1; 0 otherwise)

LANDSZ = Size of farmland cultivated by the household (Ha)

HOULOC = Location of house relative to water bodies (core coastal =1; 0 otherwise)

DSROAD = Trekking distance from house to the nearest main road (m)

DSFDMKT = Trekking distance from house to the nearest food market (m)

DSNFMKT = Trekking distance from house to the nearest non-food market (m)

Education variables (Reference category: no formal education)

PRYEDU = Highest education of household (primary education = 1; 0 otherwise)

JSSEDU = Highest education of household (junior secondary = 1; 0 otherwise)

SSVEDU = Highest education of household (secondary education = 1; 0 otherwise)

TRTEDU = Highest education of household (tertiary education = 1; 0 otherwise).

Primary occupation variables (Reference category: formal sector employment).

FISNAT = Primary occupation of household head (fishing = 1; 0 0therwise).

OFSHFA = Engagement of household head in off-shore farming (yes = 1; 0 otherwise)

State dummy variables (Reference category[1]: Lagos State)

OGUNST = Household location within southwestern zone (Ogun State =1; 0 otherwise).

ONDOST = Household location within southwestern zone (Ondo State =1; 0 otherwise).

2.3.3. Decomposition of Households' Multi-Dimensional Poverty Differences by Socio-Economic Factors

Following the decomposition technique as adapted by Ayala et al., (2009), the differences in multidimensional poverty incidence (M_0) between the core-coastal and off-shore households were decomposed by population and socio-economic subgroups into two components representing characteristics and coefficients effects. In its original form, the decomposition equation is expressed as:

$$\overline{M}_{NCR} - \overline{M}_{CR} = (\overline{X}_{CR} - \overline{X}_{NCR})\hat{\beta}_{NCR} + \overline{X}_{CR}(\hat{\beta}_{CR} - \hat{\beta}_{NCR}) + (\hat{\alpha}_{CR} - \hat{\alpha}_{NCR}) \quad (16)$$

X measures the poverty differences between groups *A* and *B* with regards to a vector of household socio-demographic and human capital factors; β measures differences in the returns or responses to these factors; and α the unexplained term that reflects the differences in the characteristics not captured by the model. Following the adaptation of previous authors (e.g, Bhaumik et al., 2006; Gradin, 2007), the differences in the incidence of multidimensional poverty (M_0) of the core-coastal and off-shore households was decomposed as:

$$M_{NCR} - M_{CR} = \overline{F(X'_{iNCR}\beta_{iNCR})} - \overline{F(X'_{iCR}\beta_{iCR})}$$

$$\overline{M}_{NCR} - \overline{M}_{CR} = \underbrace{\overline{F(X'_{iNCR}\beta_{iNCR})} - \overline{F(X'_{iCR}\beta_{iNCR})}}_{characteristics} + \underbrace{\overline{F(X'_{iCR}\beta_{iNCR})} - \overline{F(X'_{iCR}\beta_{iCR})}}_{coefficients} \quad (17)$$

where $\overline{M}_{NCR}$ and $\overline{M}_{CR}$ are the mean values of multidimensional poverty incidence for the off-shore and core-riverine households, respectively. Following the approaches of Bhaumik et al., 2006 and Gradin, 2007, the individual contribution of

[1] Residency in Lagos State is taken as reference category as one having the highest poverty incidence among the three states under study (UNICEF, 2009) as also buttressed by Oyekale et. al. (2006).

each variable *k* to the overall multidimensional poverty difference of the two groups was determined by identifying the weight associated with the contribution of each variable to the characteristics and coefficients effects, denoted as $W_{\Delta x_k}$ and $W_{\Delta \beta_k}$, respectively:

$$\overline{M}_{NCR} - \overline{M}_{CR} = \sum_{k=1}^{K} W_{\Lambda X_k} \left\{ \overline{F(X'_{iNCR}\beta_{iNCR})} - \overline{F(X'_{iCR}\beta_{iNCR})} \right\} + \sum_{k=1}^{K} W_{\Lambda \beta_k} \left\{ \overline{F(X'_{iCR}\beta_{iNCR})} - \overline{F(X'_{iCR}\beta_{iCR})} \right\}$$

where $W_{\Delta X_k}$ and $W_{\Delta \beta_k}$ are computed as:

$$W_{\Lambda X_k} = \frac{(\overline{X}_{NCR_k} - \overline{X}_{CR_k})\beta_{NCR_k}}{\sum_{k=1}^{K}(\overline{X}_{NCR_k} - \overline{X}_{CR_k})\beta_{NCR_k}}; \qquad W_{\Lambda \beta_k} = \frac{\overline{X}_{NCR_k}(\beta_{NCR_k} - \beta_{CR_k})}{\sum_{k=1}^{K}\overline{X}_{NCR_k}(\beta_{NCR_k} - \beta_{CR_k})};$$

$$\sum_{k=1}^{K} W_{\Lambda X_k} = \sum_{k=1}^{K} W_{\Lambda \beta_k} = 1$$

The logit model was the preferred preliminary step (Cameron & Trivedi, 2005) for achieving the decomposition of observed differences in poverty incidence between the core-coastal and off-shore households.

2.3.4. Test of Significance of Characteristics and Coefficients Effect on Poverty Differences among Core-Coastal and Noncore-Coastal Households

To test the statistical significance of the estimated contributions of characteristics and coefficient effects in explaining the differences in the mean probability of core-riverine and off-shore households experiencing multidimensional poverty, this study used the delta method to calculate asymptotic variances, thus:

$C = \overline{F(X'_{iNCR}\beta_{iNCR}} - \overline{F(X'_{iCR}\beta_{iNCR})}$ (27) represents the effect of the characteristics, and

$D = \overline{F(X'_{iCR}\beta_{iNCR})} - \overline{F(X'_{iCR}\beta_{iCR})}$ (28) represents the effect of the coefficients.

Based on a covariance matrix of the model's coefficients, the asymptotic variances were calculated using:

$$\sigma_C^2 = G_C \Sigma_{\beta_{NCR}} G_C' \quad \text{where } (\Sigma_{\beta NCR} = \Sigma(\beta_{NCR}) \qquad (18)$$

$$\sigma_D^2 = G_D \begin{bmatrix} \Sigma_{\beta_{NCR}} & 0 \\ 0 & \Sigma_{\beta CR} \end{bmatrix} G_D' = \frac{\partial D}{\partial \beta_{NCR}'} \Sigma_{\beta_{NCR}} \frac{\partial D'}{\partial \beta_{NCR}} + \frac{\partial D}{\partial \beta_{CR}'} \Sigma_{\beta_{CR}} \frac{\partial D'}{\partial \beta_{CR}} \qquad (19)$$

where $G_C = \left[\frac{\partial C}{\partial \beta_{NCR}^{'}}\right]$ and $G_D = \left[\frac{\partial D}{\partial \beta_{NCR}}; \frac{\partial D}{\partial \beta_{CR}}\right]$ are $1 \times K$ and $1 \times 2K$ vectors of gradients.

Under the null hypothesis of no significant effect ($C = 0$ and $D = 0$), the tests statistics are $t_C = C/\sigma_C$ and $t_D = C/\sigma_D$, which asymptotically follow a normal distribution.

For significance tests for the characteristics and coefficients effects at the individual variable *k* level:

$C_k = W_{\Lambda X_k} \left\{\overline{F(X_{iNCR}^{'}\beta_{iNCR}} - \overline{F(X_{iCR}^{'}\beta_{iNCR})}\right\}$, and (20)

$D_k = W_{\Lambda \beta_k} \left\{\overline{F(X_{iCR}^{'}\beta_{iNCR})} - \overline{F(X_{iCR}^{'}\beta_{iCR})}\right\}$ (32) with asymptotic variances of C_k and D_k defined as:

$$\sigma_{C_k}^2 = \frac{\partial C_k}{\partial \beta_{NCR}^{'}} \Sigma_{\beta_{NCR}} \frac{\partial C_k^{'}}{\partial \beta_{NCR}} \quad (21)$$

and $\sigma_{D_k}^2 = G_{D_k} \begin{bmatrix} \Sigma_{\beta NCR} & 0 \\ 0 & \Sigma_{\beta CR} \end{bmatrix} G_{D_k}^{'} = \frac{\partial D_k}{\partial \beta_{NCR}^{'}} \Sigma_{\beta_{NCR}} \frac{\partial D_k^{'}}{\partial \beta_{NCR}} + \frac{\partial D_k}{\partial \beta_{CR}^{'}} \Sigma_{\beta_{CR}} \frac{\partial D_k^{'}}{\partial \beta_{CR}}$ (22)

$\frac{\partial C_k}{\partial \beta_j^{'}}$ and $\frac{\partial D_k}{\partial \beta_j^{'}}$ being a $1 \times K$ vectors of gradients.

$C_k = 0$ and $D_k = 0$ were tested using test as $t_{C_k} = C_k/\sigma_{C_k}$ and $t_{D_k} = C_k/\sigma_{D_k}$ which are also asymptotically normally distributed.

3. Results and Discussions

3.1. Multi-dimensional Poverty Estimates of Fishing Households

Table 1 presents the households' poverty estimates using the multi-dimensional approach. As presented in the table, the value of the multi-dimensional headcount ratio is 0.603 at k = 8 (representing about 62% of the 13 poverty indicators considered). By implication, 60.3% or 270 of the fishing households are poor when

deprived in eight indicators, compared to 60.9% or 273 households for the uni-dimensional approach. The adjusted multi-dimensional poverty incidence of the households (M_0) at k = 8 was 0.3422 (and 0.6094 for the uni-dimensional approach). The adjusted poverty gap (M_1 = 0.1608) shows a deepening of the deprivation of households in the identified dimensions, implying that the poor fishing households require about 16% of the overall achievements of the non-poor to come out of poverty. Poverty severity (M_2 = 0.0761) shows a further decrease in value, reflecting that 7.61% of the fishing households suffer severe multi-dimensional poverty. This also indicates a 21.90% level of inequality among deprived states of the poor households.

Table 1. Poverty Incidence, Poverty Depth and Poverty Severity (*at k = 8*) (N = 448)

Poverty Measures	*Multi-dimensional (at k = 8)*
H	0.6030
M_0 ($\equiv P_0$)	0.3422
M_1 ($\equiv P_1$)	0.1608
M_2 ($\equiv P_2$)	0.0761

Source: Author's computation from surveyed data, 2010

3.2. Determinants of Households' Multi-Dimensional Poverty Incidence

Having a member of the household with at least a secondary education significantly reduced the probability of core-coastal households ($p<0.05$) (Table 2). Thus, minimum basic education of nine (9) years may not prevent poverty for the fishing households (Omonona, 2001; Ribar & Hamrick, 2003). This result agrees with the *a priori* expectation that investment in human capital is likely to reduce the risk of households falling into poverty as previously established by Muyanga et al., (2007); Gahia et al., (2007) and Ayala et al., (2009). Engagement of all households in fishing activities reduced the likelihood of poverty ($p<0.005$), complemented with off-shore farming activities.

Table 2. Maximum Likelihood Estimates of the Logit Regression of the Determinants of Multi-Dimensional Poverty among the Coastal Households (N = 448)

Explanatory variable	**Core-coastal[1] households**	**Off-shore households**	**All households**
Constant	0.0445** (0.0639)	0.0445** (0.0639)	0.1260 (0.1469)
Household head characteristics			
AGE	- 0.6951 (0.4779)	0.9920 (0.1316)	1.0163 (0.1146)
AGESQ	1.3025 (0.7644)	- 0.9686 (0.1405)	- 0.9372 (0.1035)
GENDER	2.1223* (1.2899)	- 0.7595 (0.3197)	1.1532 (0.3921)

[1] Core-coastal households are those whose houses are located directly over the water bodies as opposed to off-shore households whose houses are located within 1km radius of the water bodies at any particular coastal area.

Household characteristics			
HHSIZE	1.0499 (0.0957)	1.0926 (0.0645)	1.0734 (0.0509)
DEPRAT	- 0.6714 (0.3942)	1.4835 (0.5932)	1.1696 (0.3551)
FAMTYP	- 0.7343 (0.4086)	1.1369 (0.5429)	- 0.9882 (0.3361)
HHINC	- 0.0746** (0.0844)	- 0.1873** (0.1349)	- 0.1356**(0.05367)
EXTREM	- 0.7260 (0.4396)	- 0.9910** (0.0001)	- 0.0005** (0.0008)
H/hold educational attainment (Ref. category: No formal education)			
PRYEDU	- 0.7474 (0.6517)	1.3037 (0.7187)	1.0218 (0.4579)
JSSEDU	- 0.5430 (0.6180)	- 0.6948 (0.4772)	- 0.6549 (0.3762)
SSVEDU	- 0.1489** (0.1342)	- 0.7719 (0.4273)	- 04364* (0.1972)
TRTEDU	- 0.1451** (0.1450)	- 0.2928** (0.1775)	- 0.2361*** (0.1198)
Pry. occupation of H/hold head (Ref. category: formal sector job)			
FISNAT	- 0.5733 (0.5679)	- 0.3423** (0.1816)	- 0.4113** (0.1698)
OFSHFA	- 0.2237 (0.4761)	- 0.1469 (0.1716)	- 0.1580* (0.1509)
Other occupational factors			
EMPFIS	0.7820 (0.6850)	-1.4112 (0.7879)	-1.0907 (0.4776)
SPCHWK	21.8817***(16.6215)	12.4231*** (5.9150)	14.2816*** (5.4430)
H/Hold wealth variables:			
CANOES	1.1761 (0.5808)	1.4539 (0.5800)	1.0443 (0.2946)
LANDSIZ	1.5619 (1.0720)	1.4509 (0.5989)	1.4848 (0.4832)
Community variables			
DSROAD	1.0359 (0.1360)	1.0051 (0.0687)	1.0193 (0.0609)
DSFDMK	1.0045 (0.3461)	- 0.9654 (0.2131)	- 0.9840 (0.1711)
DSNFMK	- 0.9982 (0.1735)	- 0.9606 (0.1241)	- 0.9899 (0.0949)
State dummy (Ref.: Lagos state)			
OGUNST	- 0.5280 (1.3053)	- 0.6539 (0.6012)	- 0.6761 (0.5174)
ONDOST	- 0.1105** (0.1128)	- 0.2663** (0.1663)	- 0.2206*** (0.0974
	No. of obs. = 150 LR χ^2 = 55.96 Prob. > λ^2 = 0.0001 Pseudo R^2 = 0.3054 Log. Lik. = - 63.65	No. of obs. = 298 LR χ^2 = 78.50 Prob. > λ^2 = 0.000 Pseudo R^2 = 0.2374 Log. Lik. = - 126.09	No. of obs. = 448 LR χ^2 = 122.41 Prob. > λ^2 = 0.000 Pseudo R^2 = 0.2372 Log. Lik. = - 196.80

Source: Field survey data, 2010. (Standard error of coefficient in parenthesis)

***, ** and * denote variable is significant at the 1%; 5% and 10% level, respectively.

This finding negates the earlier report of Dhanapala (2007) who observed that participation of Sri Lanka households in the agriculture sector does not significantly contribute to the poverty reduction. Female-headed households were more prone to poverty among core-coastal households ($p<0.1$) than their male counterparts. Increasing income significantly ($p < 0.05$) reduces the risk of multidimensional poverty among all coastal households in the southwestern zone irrespective of their location with respect to water bodies. This fact is underscored by the possibility that the level of poverty reduction depends partly on the rate of average income growth, the initial level of inequality, and changes in the level of inequality among various income groups in the rural population (World Bank, 2001).

3.3. Contribution of Socio-Economic Factors to Observed Differences in Households' Multi-Dimensional Poverty

The contribution of selected socio-demographic variables to the total differences in poverty incidence between the core-coastal and off-shore households is presented in Table 3. Engaging in fishing activities and being polygamous contributed significantly to inequality in the poverty rates between the two coastal sub-population groups at the 1% level. Differences in human capital (educational) attainment of members of the households did not determine variation in poverty rates but having a member of the household with minimum basic education will significantly contribute to differences in households' poverty incidence ($p = 0.10$).

Table 3. Contribution to Differences in Multi-Dimensional Poverty Incidence by Selected Demographic Factors (N = 448)

State	***Characteristics effects***	***Coefficient Effects***	***Differences***	***Unexplained Component***
Educational Factors				
Primary education = 1	- 0.0341 (0.0466)	0.0042 (0.0514)	- 0. 0084 (0.0582)	0.0215 (0.0502)
Junior sec. education = 1	0.0722 (0.0776)	- 0.0130 (0.0785)	- 0. 1232* (0.0741)	- 0.1724** (0.0849)
Senior sec. education = 1	0.0494 (0.0773)	0.0122 (0.0610)	0.0148 (0.0591)	- 0.0468 (0.0806)
Post-secondary education = 1	1.0158 (0.1705)	0.0239 (0.0765)	0.0451 (0.0762)	0.9946*** (0.1683)
Occupational Factors				
H/Head pry. employment (Fishing/NRC = 1)	- 0.2028* (0.1088)	- 0. 0487 (0.0631)	- 0.0205 (0.0570)	0.2310** (0.1118)
Employment status in fishing/NRC (fulltime = 1)	- 0.0026 (0.1265)	- 0.1493* (0.0889)	- 0.0845 (0.0668)	0.0674 (0.1461)
Spouse or child working = 1	0.0309 (0.0514)	0.0292 (0.2754)	- 0.0050 (0.0964)	- 0.0652 (0.2736)
Demographic Factors				
Gender (female = 1)	0.0420 (0.0934)	- 0.0080 (0.0677)	0.0368 (0.0574)	0.0027 (0.1015)
Family type (polyg. = 1)	0.1478* (0.0896)	0.0102 (0.0672)	0.0568 (0.0632)	- 0.1013 (0.1032)

Source: Field survey data, 2010. (Standard error of coefficient in parenthesis)

***, ** and * denote variable is significant at the 1%; 5% and 10% level, respectively.

3.4. Contribution of Location Variables to Observed Differences in Households' Poverty

From Table 4, observed differences in poverty incidence among the coastal households in Ogun and Lagos States were due to variations in the socio-demographic characteristics of the households; and differences in behavioral responses of the surveyed households associated with socio-economic factors for the southwest zone. Other unobserved factors also contributed significantly (at 5%) to differences in poverty rates for Ogun and Lagos States. The estimated poverty difference between the two coastal sub-population groups was significant for the southwest households at the 1% level.

Table 4. Decomposition of Difference in Households' Multi-Dimensional Poverty Incidence by State of Location (N = 448)

State	*Characteristics Effects*	*Coefficient Effects*	*Differences*	*Interactions*
Ogun	- 0.9730** (0.4631)	0.0228 (0.1338)	0.0196 (0.0309)	0.9698** (0.4809)
Ondo	- 0.5996 (0.6686)	0.0393 (0.0365)	0.0105 (0.0310)	0.5709 (0.6688)
Lagos	0.7268*** (0.2772)	- 0.0637 (0.1324)	-0.0261 (0.0280)	-0. 6892** (0.3057)
Overall (S-W Zone)	0.1442 (0.1406)	- 0.0874*** (0.0328)	- 0.0784*** (0.0287)	- 0. 1353 (0.1416)

Source: Field survey data, 2010. (Standard error of coefficient in parenthesis)
***, ** and * denote variable is significant at the 1%; 5% and 10% level, respectively.

4. Summary, Conclusion and Recommendations

Results of the analysis revealed the need to put a lot of intervention programmes in place in order to address fisher-folks' poverty level. Access to basic education and formal economic livelihood will reduce households' poverty levels among the fisher-folks. Locating non-food markets close to the fishing households will reduce households' susceptibility to poverty. Engagement of households in on-shore fishing and being polygamous contributed significantly to inequality in the poverty rates between the two coastal sub-population groups at the 1% level. Based on the findings, the recommendations from the study are specific, namely: 1). that improved access to formal education and use of motorised canoes should be a priority at abating the poverty condition of the fishing households; and 2). that poverty-reduction intervention programmes should be targeted at different socio-economic groups among the poor.

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