Data for the Regional and Provincial Analyses of Households' Economic Well-Being in Burkina Faso.

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Abstract

Although household and business surveys generally collect regional codes, indicators are usually not tabulated by that dimension in international comparisons [13], as a result information on the extent of regional disparities or dispersion within countries is often unavailable [11]. This is why a call was made for collaboration between international organizations and G20 countries and partner countries to make regional data available, by advancing on methods to make microdata more accessible for progress [12]. The present data article inscribes itself within this context with the aim of bridging the above highlighted data gap. We achieve this by capitalizing on the 2014 Burkina Faso's National Survey on Households Living Conditions, to provide regional and provincial levels aggregated households' welfare indicators, along with socio-economic and demographic characteristics in Burkina Faso. The presented welfare extract, which covers 10411 households distributed across 45 provinces, and grouped into 13 administrative regions, is further supplemented with geospatial meta-data for analyses in the space dimension.

Specifications Table

Subject area	*Economics*
More specific subject area	*Development Economics, Welfare Economics*
Type of data	*Table*
How data was acquired	*Extracted from round 4 of the 2014 Household Survey "Enquete Intégrale sur les Conditions de Vie des Ménages (EICVM)" or "National Survey on Household Living Conditions" in Burkina Faso at* http://www.insd.bf/n/nada/index.php/catalog/ECVM
Data format	*R format data*
Experimental factors	*Welfare indicators, Socio-Economic and demographic Variables, Household Total spending on food and non-food consumption, Regional and Provincial levels Geospatial meta-data.*
Experimental features	*Retrospective cross-sectional probability sample, based on a two-stage stratified design targeting 12 households in each of 905 Primary sampling units, for an initial sample size of approximately 10860 households. Geospatial meta-data for 13 administrative regions and 45 provinces.*
Data source location	*It is a nationally representative survey, covering all 13 administrative regions and 45 provinces of Burkina Faso. Its Universe includes all households living in the country at the time of the survey, but excludes group households such as academic institutions, hospitals or military bases.*
Data accessibility	*The Data is included with this submission.*
Related research article	• *Niankara, I. "Gender inequality in literacy status and its effects on households economic well-being in Burkina Faso: a semi parametric bivariate sample selection modelling approach" International Journal of Economics and Business Research 17(2), 218-242.* • *Niankara, I. "Education's effect on Food and Monetary Security in Burkina Faso: A Joint Semi-parametric and Spatial Analysis" African Journal of Science, Technology, Innovation and Development (Under Review)*

Value of the Data

- This data is valuable for understanding the distribution of welfare in Burkina Faso in terms of overall economic well-being, food and non-food wellness.
- It provides a unique opportunity to study households' behaviors in terms of food and non-food consumption spending in Burkina Faso
- The spatial methods, data, and computer codes presented with this data article provides new angles that can benefit prospective households welfare analyses, but also inspire cross-country comparative welfare analyses.

1. Data

This article presents the R data object "HhWelfareDataBF", which contains three R data frames "emc2014_welfare", "ProvinceOutcomeDat2", and "regionOutcomeDat1" respectively. The first data frame "emc2014_welfare" is extracted from the 4th round of the 2014 National Survey on Household Living Conditions "Enquete Intégrale sur les Conditions de Vie des Ménages" [1]. It is a nationally representative sample with universe including all households living in the country at the time of the survey, but excluding group households such as academic institutions, hospitals , or military bases. The survey was administered by the National Institute for Statistics and Demography "Institut Nationale de la Statistique et de la Démographie" (INSD) in Burkina Faso using face-to-face interviews from January to December 2014. The Maps 1 and 2 below show the geographical (regional and provincial) coverage of the data. Table (1) below describes the key experimental factors in the data.

Table (1): Description of the primary variables contained in the R data object "emc2014_welfare"

Variables	Names
annee	The year of the survey
hhid	Household ID
grappe	Primary Sampling Units (PSUs)
menage	Secondary Sampling Units (SSUs)
region	Household's administrative region of residency
province	Household's province of residency
milieu	Household's place (rural/urban) of residency
hhweight	Household's weight (coefficient of extrapolation)
hpwei	Household weigh times household size
hhsize	Household's size
hgender	Gender of the head of household
hage	Age of the head of household in years
hmstat	Head of household's marital status
heduc	Head of household's education level
halpha	Head of household's literacy status
hactiv	Head of household's status of occupation
hbranch	Head of household's branch of activity
hsins	Head of household's institutional sector of activity
hgse	Head of household's socio-economic status
strate	Regional Strata
panel	Round of interview
dalim	Total household food consumption spending in CFA franc
dnalim	Total household non-food consumption spending in CFA franc
deptotnd	Total nominal household (food and non-food) consumption spending in CFA
pcnorm	Normalized annual personal consumption expenditure
zref	Overall Poverty line for the year 2014
zref_f	Food poverty threshold for the year 2014
zref_nf	Non-food poverty threshold for the year 2014
deflateur	Spatial deflator
pcexp	Welfare indicator (reel personal consumption expenditure)

The second data frame "ProvinceOutcomeDat2" with 45 observations is produced by splitting the first data set "emc2014_welfare" into its provincial planes using "dplyr" [9], and then computing the mean, median and standard deviations for select key variables (see the attached R based computer codes for more details). Finally, the third data frame "regionOutcomeDat1" with 13 observations results from splitting "emc2014_welfare" across its 13 regional planes, and then computing aggregated summary statistics as in the case of the second data frame (see also the attached R based computer codes for more details). The last two data frames are used in the provincial and regional data mapping presented in this articles after merging them with the corresponding geospatial coordinates from the GADM library [10].
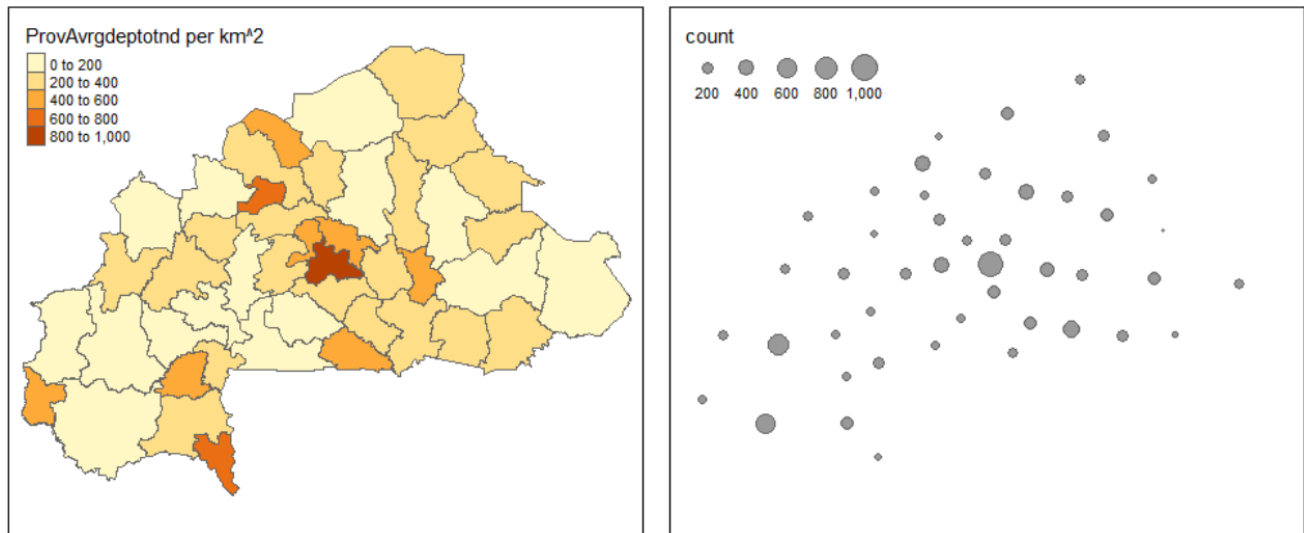
Map 1: Spatial distribution of household count (right panel) and nominal average per-capita consumption spending (left panel) across the 45 provinces
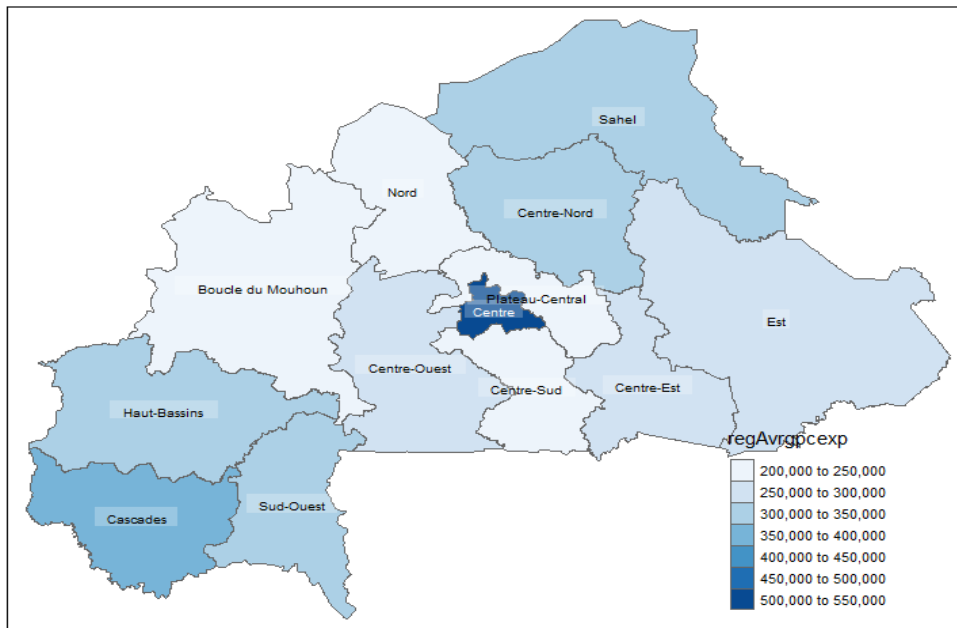
Map 2: Spatial distribution of real per-capita consumption spending across the 13 administrative regions

1.1. Constructed Welfare Measures

The market value of goods and services consumed by households is a generally accepted measure of economic well-being [2], [3]. Following [4] and [5] we rely on households' nominal per-capita consumption spending to construct qualitative welfare indicators.

1.1.1. Food wellness measure

Represented by households' nominal per-capita spending on food consumption (CapSpendgF), it is constructed as the ratio of total household food consumption spending (dalim), and household size (hhsize).

1.1.2. Non-Food wellness measure

Represented by households' nominal per-capita spending on non-food consumption (CapSpendgNF), it is constructed as the ratio of total household non-food consumption spending (danlim), and household size (hhsize).

1.1.3. Total Economic well-being measure

Represented by households' nominal per-capita spending on food and non-food consumption (CapSpendg), it is constructed as the ratio of total household consumption spending (deptotnd), and household size (hhsize).

1.2. Qualitative welfare Indicators

These are binary indicators constructed using the nominal welfare measures in table 1, with the corresponding food, non-food, and overall poverty lines for the year 2014.

1.2.1. Food Poverty indicator

$$foodpovstat = \begin{cases} 1 ; & If \;\; CapSpendgF > PovlineF \\ 0 ; & If \;\; CapSpendgF \leq PovlineF \end{cases} \qquad (1)$$

Where "CapSpendgF" and "$PovlineF$" represent respectively the per-capita spending on food, and the food poverty line for 2014, which is equal to 102040 CFA Francs.

1.2.2. Non-food Poverty Indicator

$$nfpovstat = \begin{cases} 1 ; & If \;\; CapSpendgNF > PovlineNF \\ 0 ; & If \;\; CapSpendgNF \leq PovlineNF \end{cases} \qquad (2)$$

Where "CapSpendgNF" and "$PovlineNF$" represent respectively the per-capita spending on non-food consumption, and the non-food poverty line for 2014, which is equal to 51490 CFA Francs.

1.2.3. Overall Poverty Indicator

$$totpovstat = \begin{cases} 1 ; & If \;\; CapSpendg > Povline \\ 0 ; & If \; CapSpendg \leq Povline \end{cases} \qquad (3)$$

Where "CapSpendg" and "$Povline$" represent respectively the overall per-capita spending on consumption, and the overall poverty line for 2014, which is equal to 153530 CFA Francs.

2. Experimental Design, Materials, and Methods

The 2014 EICVM Survey from which this data is extracted was administered in 4 rounds between January and December 2014, and designed to produce indicators that are comparable and harmonized as much as possible with international standards. The survey has a core questionnaire along with specialized modules, administered in one or more of the rounds for about 30 minutes each to a subsample of the entire sample. Its units of analysis are households and the individuals within them. Its scope covers among others household members characteristics; households economic situation; employment status of household members 15 years or older; education and access to ICTs; food safety and anthropometric measurements.

2.1. Sampling

The survey uses a two-level stratified random sampling with weights that produce nationally representative estimates for households' annual per-capita consumption spending, and a wide range of demographic and socioeconomic characteristics for the civilian, non-institutionalized population in Burkina Faso. Primary sampling units (PSUs) are selected with probability proportional to their size, and the secondary sampling units (SSUs) or households selected with equal probability within those PSUs.

The annual size of the survey is kept fixed because of budgetary constraints and survey parameters such as design effect, coefficient or variation, and required precision level. This is also intended to take into account the significance of requirements at different levels of population grouping including national, regional, and area of residence. The survey produced an initial sample size of 10860 households, generated from randomly selecting 12 SSUs in each of the randomly drawn 905 PSUs from the first stage sampling.

2.2. Analyses Overview

The data was mainly analyzed using the R statistical software [6], and summarized in tables (2 - 6) and figures (1-7). Excel was also used to produce the relative frequency bar charts (RFBC) presented in figures (8-17). Furthermore, eight additional dynamic web-based maps of the data are provided in the supplementary materials for possible online publication.

Table (2): Summary statistics for the constructed nominal welfare measures in levels and logged

	Welfare measures in Levels			Logged Welfare Measures		
	Food	Non-Food	Overall	Food	Non-Food	Overall
N	10411	10411	10411	10411	10411	10411
Minimum	14980	8258	31940	9.62	9.02	10.37
Q1	64070	54120	124200	11.07	10.90	11.73
Q2 (Median)	93240	82470	181500	11.44	11.32	12.11
Mean	137900	135100	273000	11.54	11.44	12.22
Q3	149300	143600	292700	11.91	11.87	12.59
Max	2208000	2722000	4332000	14.61	14.82	15.28

As seen in table (2) and figures (1-3) welfare is highly right skewed in the country. This is true across all 3 measures of welfare, which are then fairly normal after logged transformation.

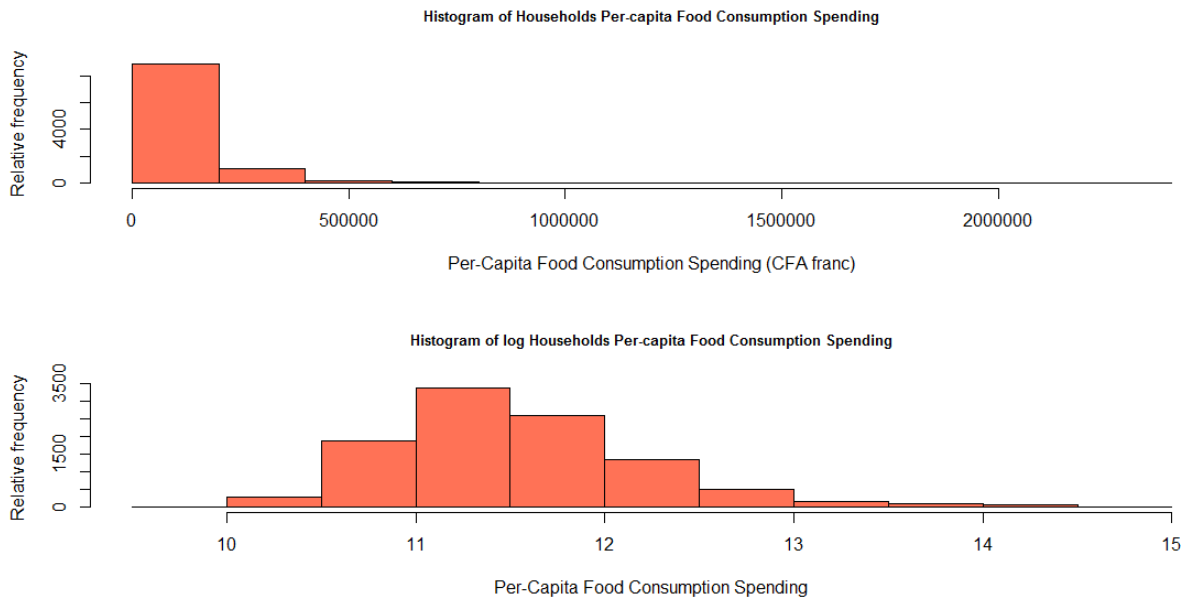Figure (1): Histogram of per-capita food consumption spending in levels and logged

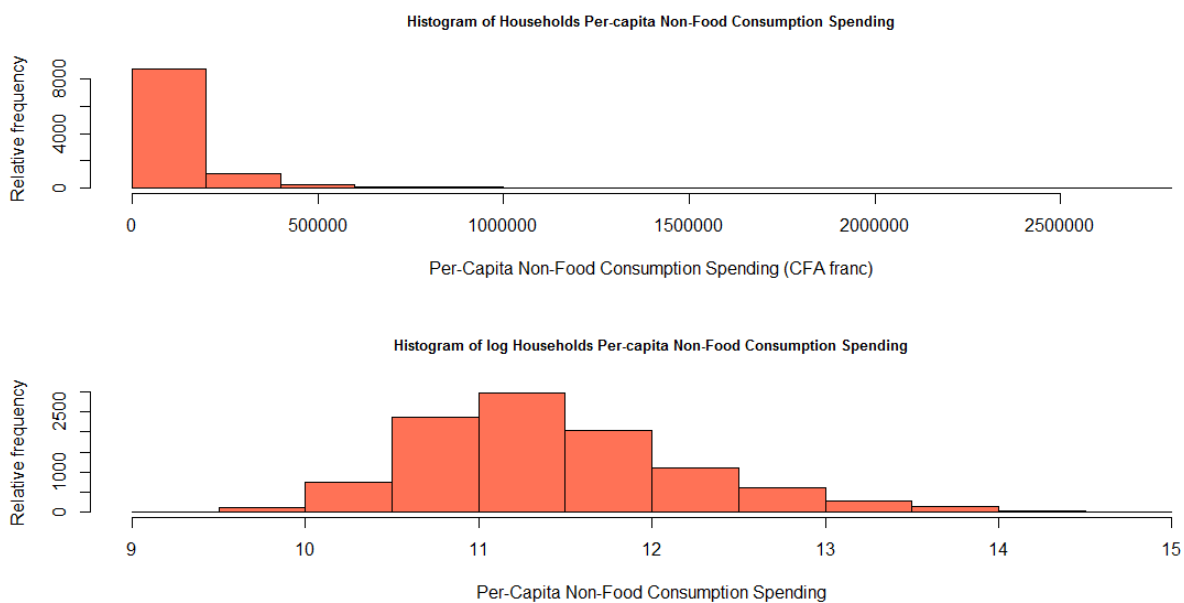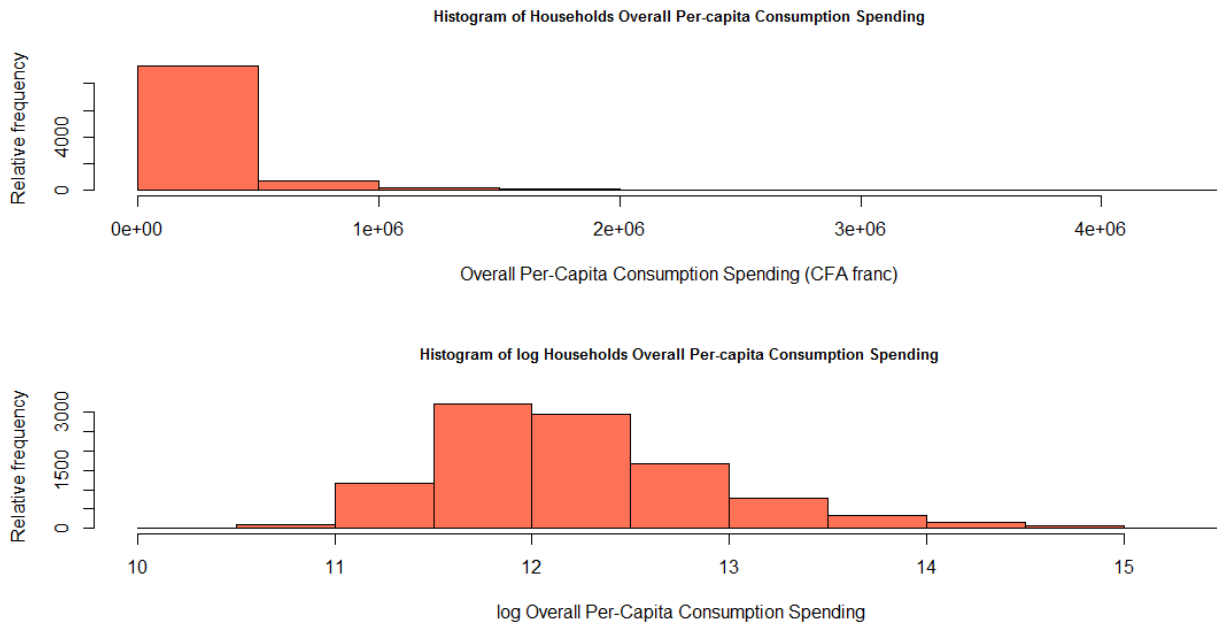Figure (2): Histogram of per-capita non-food consumption spending in levels and logged

Figure (3): Histograms of overall per-capita spending in levels and logged

To further describe the levels of inequality in food wellness, non-food wellness, and overall economic well-being, we also compute the Lorenz curves presented in figures (4, 5, 6), and the inequality indices (Atkinson and Gini coefficient) presented in table (3) using the R function "LC" (see [7]).

Figure (4): Lorenz curves describing the conditional inequality in food-wellness by poverty status
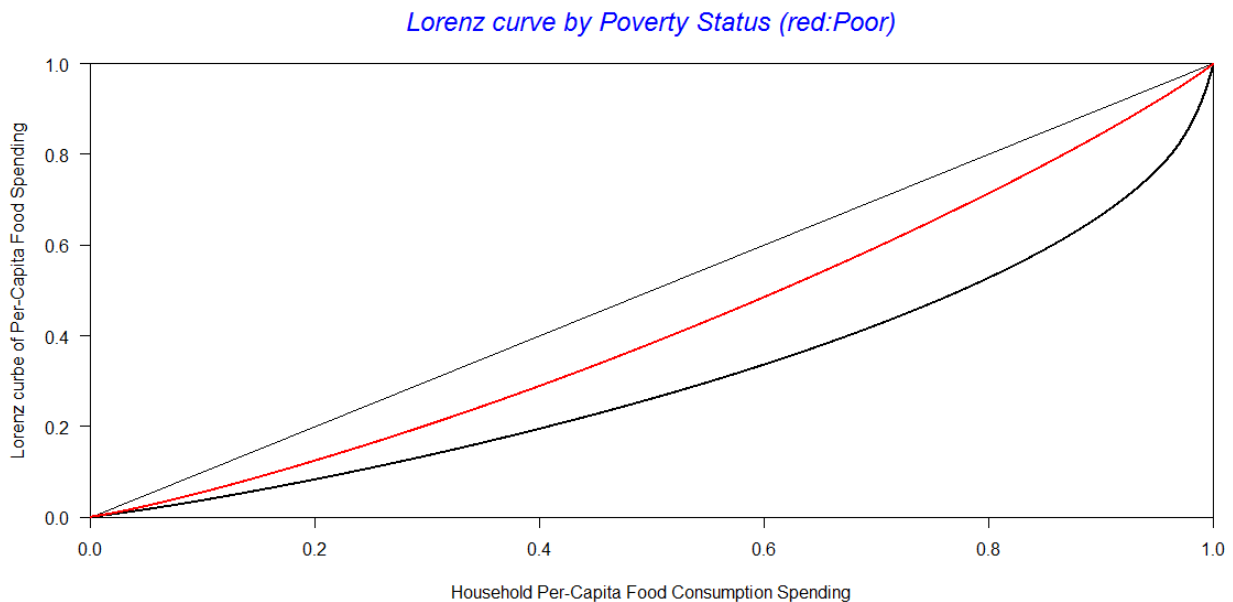
Figure (5): Lorenz curves describing the conditional inequality in non-food-wellness by poverty status

Lorenz curve by Poverty Status (red:Poor)
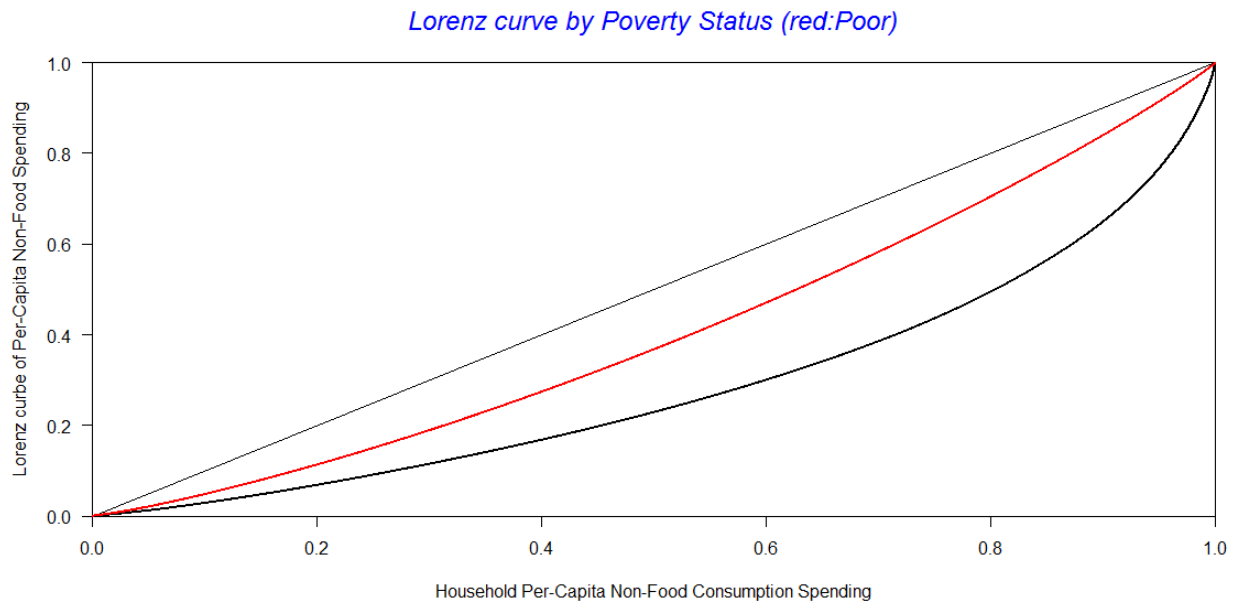
Figure (6): Lorenz curves describing the conditional inequality in total economic welfare by poverty status

Lorenz curve by Poverty Status (red:Poor)
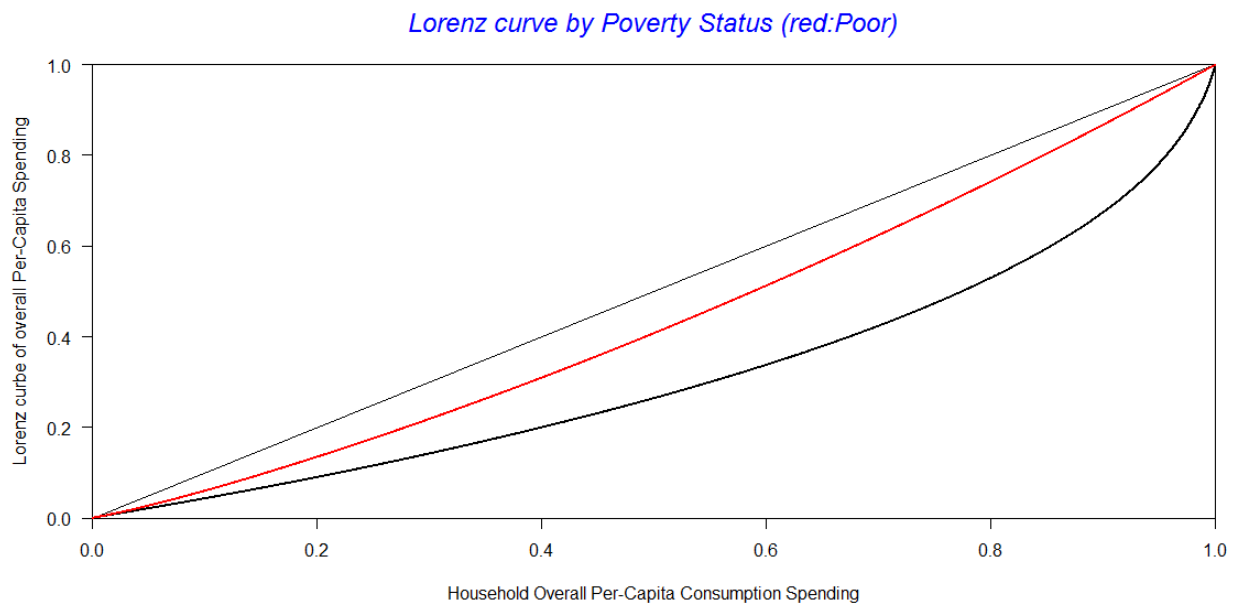
These graphical results by the Lorenz curves are further supported by the conditional estimates of the Atkinson and Gini inequality indices by poverty status in table (3).

Table (3): Conditional estimates of the inequality indices by poverty status

	Food		Non-Food		Overall	
N	Poor	Non-Poor	Poor	Non-Poor	Poor	Non-Poor
10411	0	1	0	1	0	1
Atkinson	02.14 %	12.54 %	02.78 %	14.75 %	01.32 %	11.66 %
Gini	16.39 %	37.97 %	18.49 %	42.38 %	12.66 %	36.96 %

In order to compare the inequality in food-wellness to that in non-food wellness, we compute the inequality indices summarized in table (4), along with the Lorenz curves presented in figure (7).

Table (4): Unconditional estimates of the inequality indices

N = 10411	Food	Non-Food	Overall
Atkinson	15.25 %	18.50 %	15.19 %
Gini	42.37 %	47.51 %	42.73 %

Fig (7): Lorenz curves describing the inequality in food-wellness and non-food wellness

Lorenz curve by spending/consumption type (red: Food expenditure)
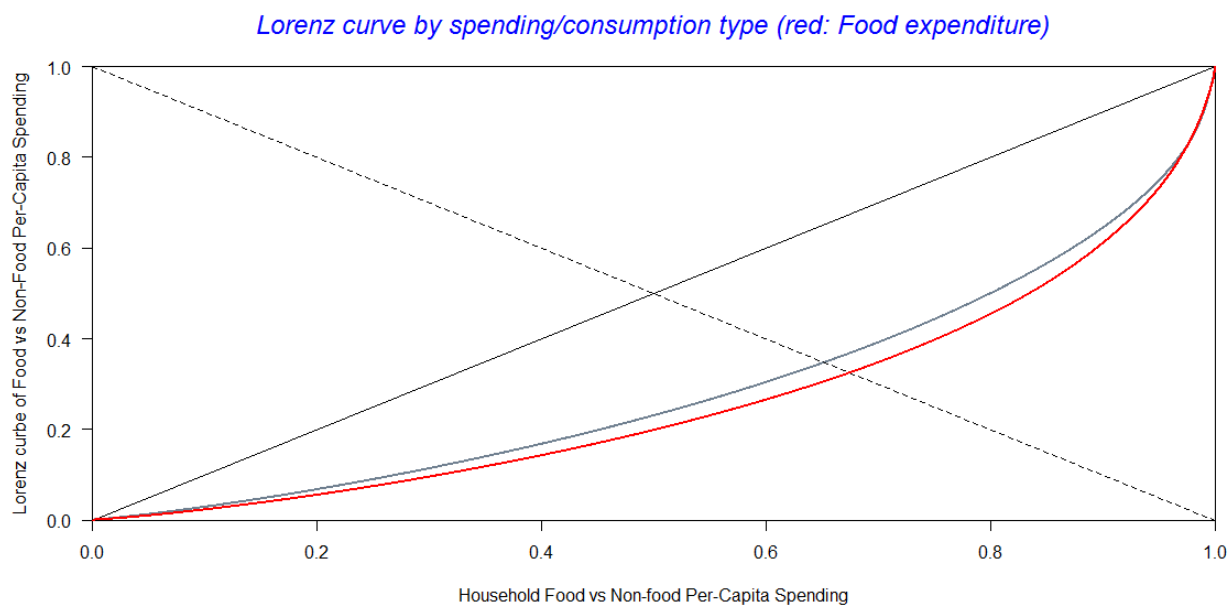
The unconditional distribution of food wellness, non-food wellness, and overall welfare is summarized in table (5) below, using the poverty indices of Watts, Sen and Foster (alpha =0), and (alpha =1) (see [7]).

Table (5): Estimates of the poverty indices for all three welfare measures

	Food	Non-Food	Overall
Poverty Line	130,350	23,180	153,530
Watts	25.88 %	07.12 %	13.35 %
Sen	25.02 %	07.75 %	14.16 %
Foster (alpha = 0) – Incidence / Headcount index	6.62	3.74	5.74
Foster (alpha = 1) – Poverty gap index	55.55 %	22.63 %	39.20 %

Table (6) below provides the 5 number summary along with the mean values of the key quantitative variables in the data

Table (6): Descriptive Statistics of the Key Quantitative variables in the data

Variable	Min	Q1	Median	Mean	Q3	Max
hhweight	12.79	93.10	214.40	232.80	312.50	1499.00
hhsize	1.00	4.00	6.00	7.48	9.00	63.00
hage	15.00	34.50	45.00	46.57	57.00	99.00
dalim	54340	417900	636200	763900	956500	17670000
dnalim	37690	350700	565500	747200	923100	9034000
deptotnd	109900	826800	1241000	1511000	1875000	26700000
pcnorm	0.251	0.936	1.351	1.986	2.140	30.530

The key qualitative variables in the data are further described in figures (8 - 17) below, using relative frequency bar charts (RFBC):

Figure (8): RFBC of households' distribution across the 13 administrative regions in Burkina Faso
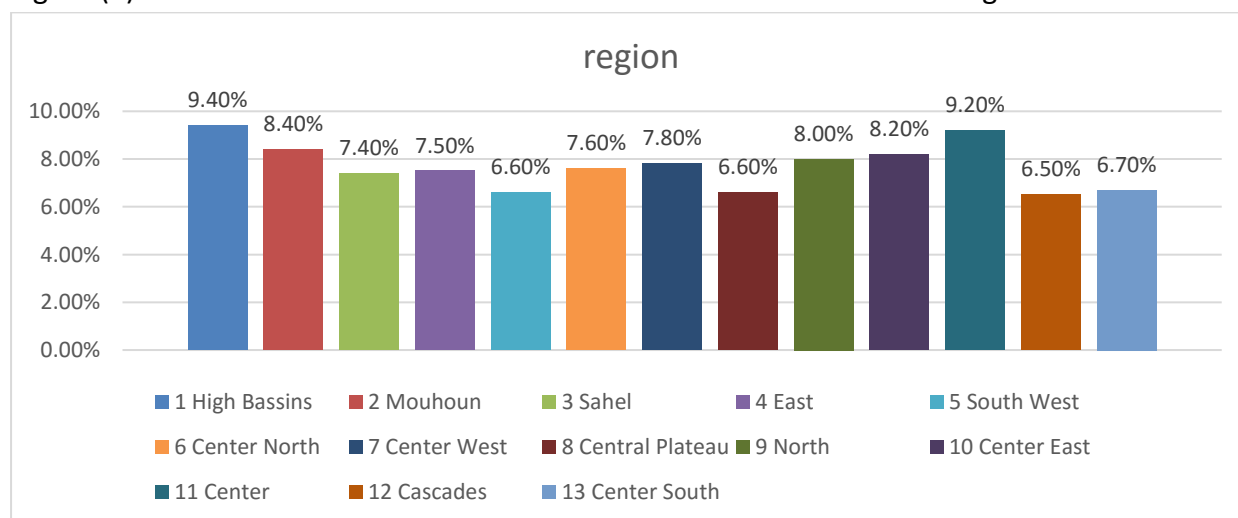
Figure (9): RFBC of households' distribution across rural and urban areas
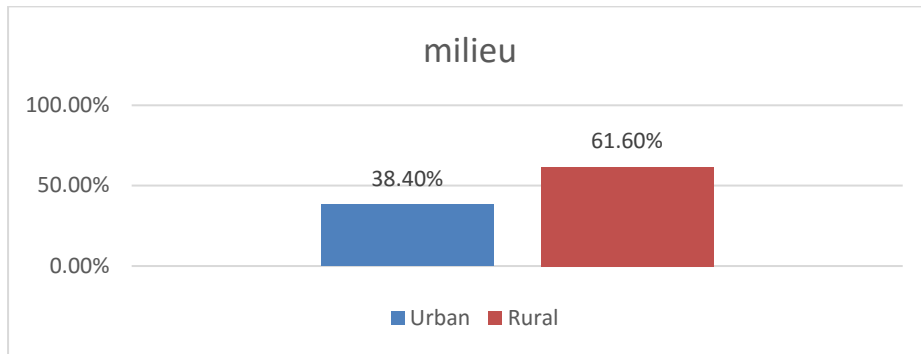

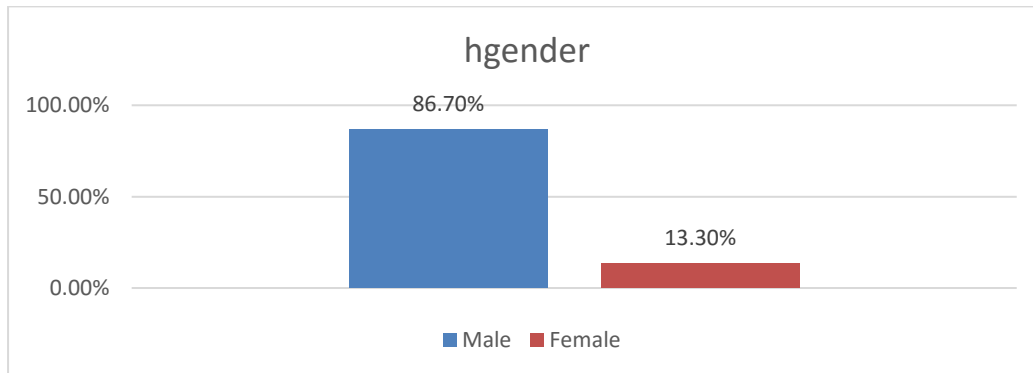Figure (10): RFBC of heads of households' gender

Figure (11): RFBC of heads of households' marital status
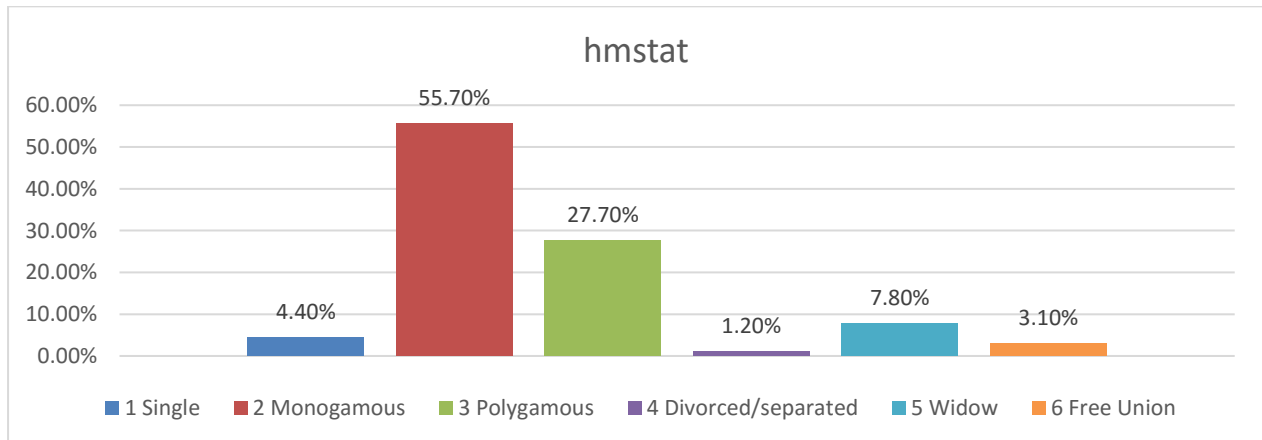
Figure (12): RFBC of heads of households' education level
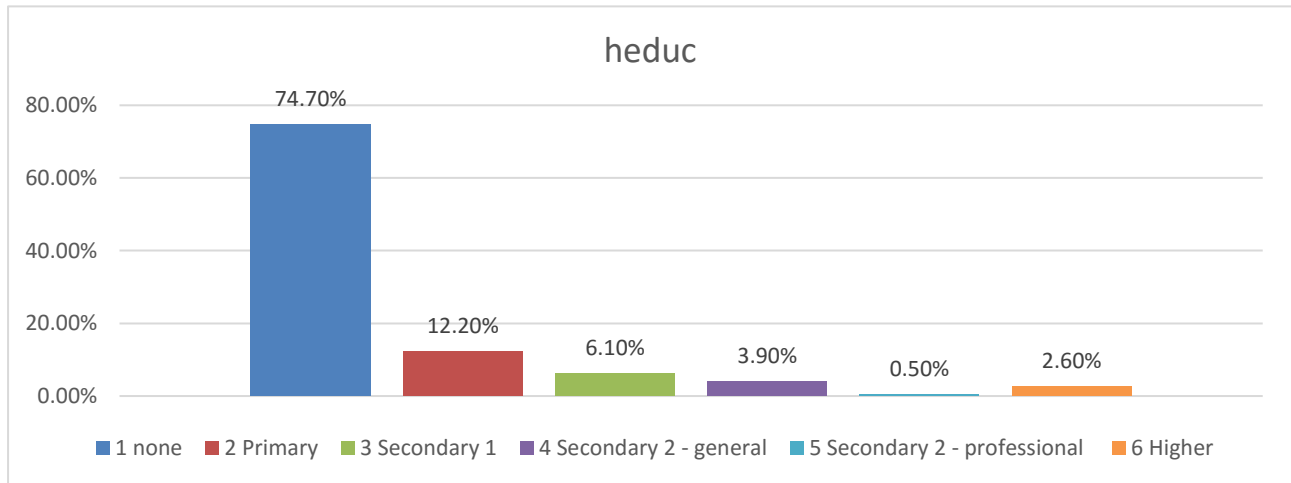

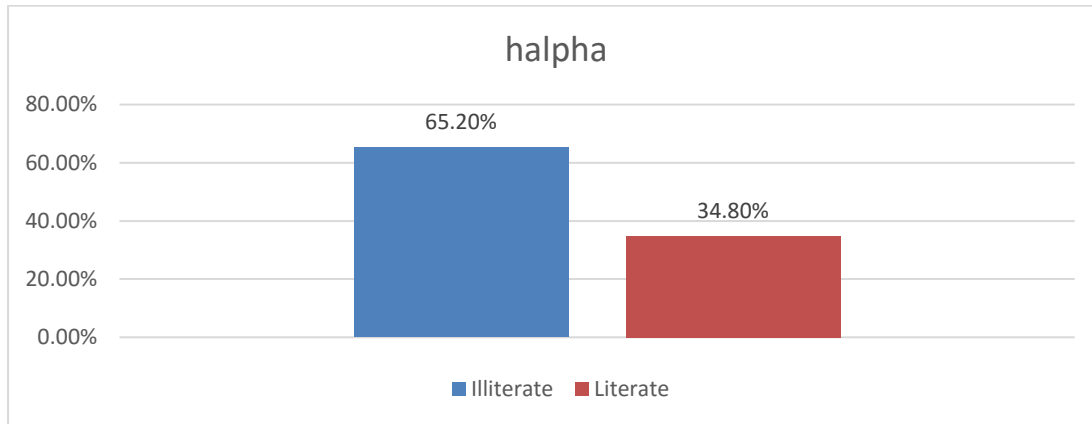Figure (13): RFBC of heads of households' literacy status

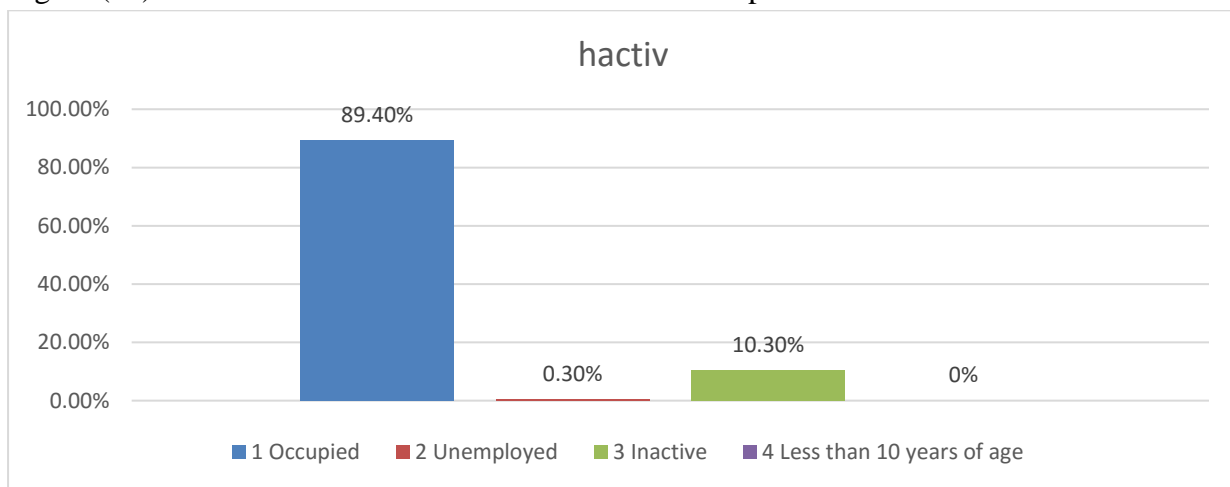Figure (14): RFBC of heads of households' status of occupation

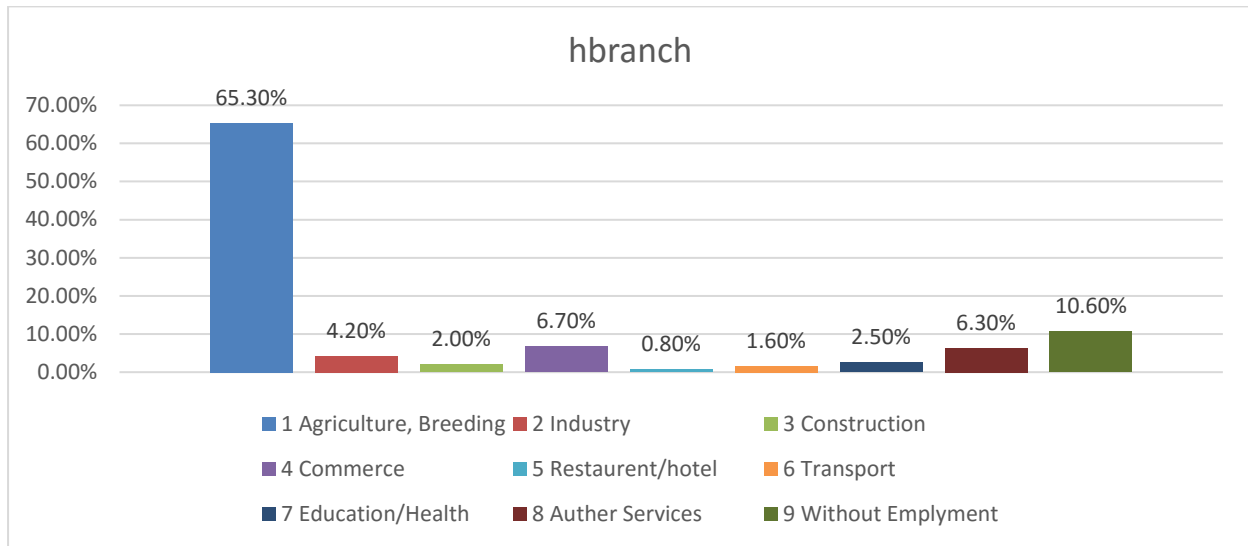Figure (15): RFBC of heads of households' branch of activity

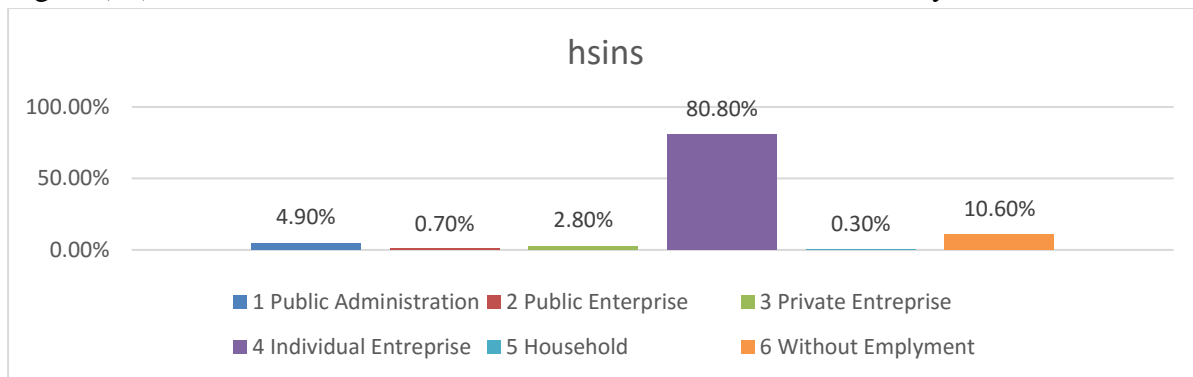Figure (16): RFBC of heads of households' institutional sector of activity
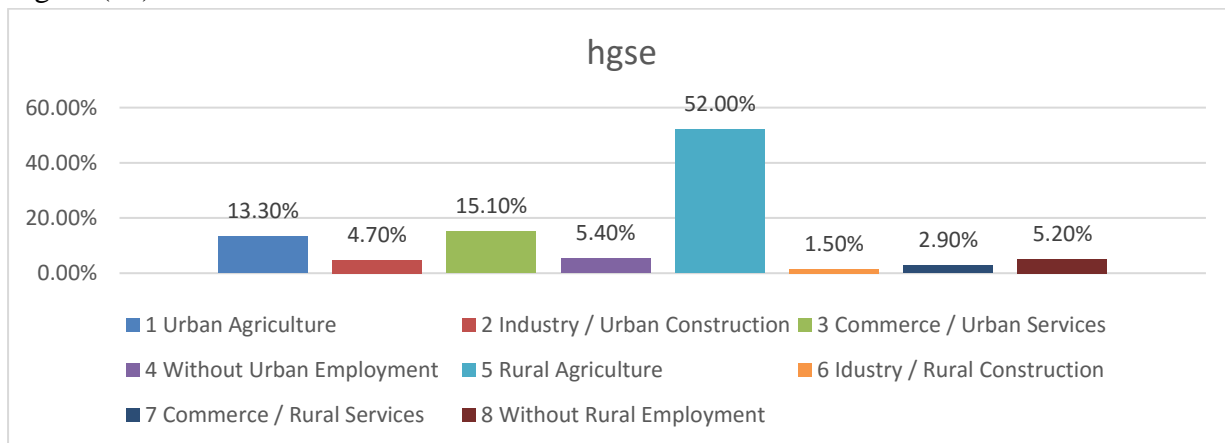

Figure (17): RFBC of heads of households' socio-economic status

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