

Assessing Interrelationship between Income and Food Consumption by Rural Households in Sri Lanka

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ABSTRACT

The study was aimed to assess the potential interrelationship between the monthly income and the share of which has been expensed on purchasing food items (i.e. food expenditure) in the context of rural household settings in Sri Lanka, and the effect of socio-economic characteristics of those households on this behavior. The primary data collected from a randomly selected sample of households (n=608) located in the Kurunegala, Matale and Anuradhapura Districts through a pre-tested structured questionnaire were used. The food share estimated for each household were used to calculate Gini-coefficient pertaining to different segment of households, and then to plot the Lorenz Curve. The value of food share of each household was modeled with selected socio-economic variables, including gender, household size, occupation, monthly income and level of education and Multiple Linear Regression Analysis techniques were applied to estimate the model. Results reveal that only gender and level of education have significant effect on food share indicates that food purchasing decisions change with gender and education. Income was not significant effect on food share indicated that there was no relationship between income and food consumption.

KEYWORDS: Food expenditure, Food security, Income distribution, Rural households

INTRODUCTION

Food is an important component when considering the total consumption. As well as the level and distribution of food consumption is a major indicator of social welfare. Although, there is a list of determinants in which food consumption patterns can be changed overtime. Income is one of the determinants on consumption of the quantities of different food items. Generally, the consumers with low income make large share of expenditure in the consumption of food. The Upper and middle class mostly expend their income on personal services and other non-food items (Amir and Hakan, 2015).

Moreover, the link between food expenditure and income is illustrated in consumer demand theory. So that food expenditures were representing a significant portion of disposal income among households. Other than that family size, preferences of family members and distribution of assets *etc.* influencing the expenditures for food total by primary food groups (e.g. cereals, milk and milk products, pulses *etc.*). This is an important element in the development of appropriate policy related to the mitigation of malnutrition of rural households (Keithly *et al.*, 2015). Poor and rich families changed their level and pattern of food consumption based on a budget that covers food and non-food expenses (Hymans and Shapiro, 1974).

When compare the food and non-food expenditure at sector levels in Sri Lanka, the urban and the rural sector household spend more on non-food than food. But the Estate sector non-food expenditure and food expenditure are almost equal. Food share/expenditure which is total amount of food and beverages divided by the total amount of expenditure (food and non-food expenditure) and the total income received by all the members of the household, either monetary or non-monetary is refers to as monthly household income. Sri Lanka food ratio is 37.8%, while rural sector food ratio is 39.2% and the Gini-coefficient of food expenditure in Sri Lanka around 0.4, while Gini-coefficient of rural sector food expenditure is 0.39 (Department of Census and Statistics, 2012/13).

Food security in general, described under three essential elements, namely, availability of food (i.e. the amount and the quantity of food available globally, nationally or locally), accessibility of food (i.e. where the households have the purchasing power) and utilization of food (i.e. sufficient and varied food needs to be prepared safely people to grow and development) which are direct or indirect determinants of food security. At the household level, food security is, in turn, defined as the ability of the household to secure enough food to ensure adequate dietary intake for all of its members (Mukkarama *et al.*, 2010). In general, considered rural household compared to urban

household of the country, and as a result, may not have continuous access to quality food secure for both food and nutritional security within the household.

With this background, the specific objectives of this study were of two-fold. First, assess the interrelationship between income and food expenditure (i.e. food share) in the context of rural households in Sri Lanka. Next, examines the effect of certain socio-economic characteristics on the household food share.

METHODOLOGY

Theoretical Framework

The first step towards the assessment was to define and identify the key factors affecting food share, which is the total amount of food and beverages divided by the total amount of expenditure (food and non-food expenditure). The key factors determine it may include: gender, occupation, household size, level of education and monthly household income (i.e. the total income received by all the members of the household, either in monetary or non-monetary terms).

Next step was to calculate food share for each household was used to estimate the Gini-coefficient and then to plot the Lorenz Curve to explore the distribution of food share of rural households.

The Gini-coefficient is a measure of inequality of a distribution of which the values range between 0 to 1, where 0 corresponds to perfect income equality (i.e. everyone has same income), while 1 denotes perfect income inequality (i.e. one person has all the income and everyone else has zero income; Weber, 2005). If the area between the line of perfect equality and Lorenz Curve is considered as "A" and the area under the Lorenz Curve is "B"; then, the Gini-coefficient can be expressed as: $A / (A+B)$. If the Lorenz Curve is represented by the function $Y = L(x)$, the value of B, for a population with values y_i , where $i=1$ to n and $G =$ Gini-coefficient, can be found with integration as follows:

$$G = 1 - 2 \int_0^1 L(X) dX \quad (1)$$

$$G = \frac{1}{n} \left(n + 1 - 2 \frac{\sum_{i=1}^n (n + 1 - i) y_i}{\sum_{i=1}^n y_i} \right) \quad (2)$$

Once the food share was estimated, the following regression was established to examine the relationship of which with the socio-economic characteristics (especially income) of the households in the sample.

$$FSH = \beta^0 + \beta_1 * GEN + \beta_2 * FAM + \beta_3 * OCC + \beta_4 * INC + \beta_5 * EDU \quad (3)$$

Where, FSH- food share; β^0 - constant; GEN- gender; EDU- level of education; FAM- family size; INC- monthly household income; OCC- occupation.

Data Collection and Analysis

The primary household data required for analysis were obtained from the data base managed under the National Thematic Research Program (NTRP) through which a household survey carried out in Kurunegala, Matale and Anuradhapura Districts, where a structured questionnaire-based survey was completed with 608 respondents selected randomly to estimate the food expenditure, all the food items consumed by the households during a period of month which is including cereals, prepared food, vegetables, fish, meat etc. were taken into account.

RESULTS AND DISCUSSION

Descriptive Statistics of the Sample

The socio-economic characteristic of the sample was reported in Table 1.

Table 1. Descriptive Statistic of the sample

Descriptive Character	Percentage (%)
Gender	
Male	82.6
Female	17.4
HH Size (No of Persons)	
<2	5.8
3-4	78.8
5-6	14.1
>6	1.0
Monthly Income (Rs.)	
<25,000	33.9
25,000-50,000	54.3
50,000-100,000	10.4
>100,000	1.5
Occupation	
Agriculture base	10.4
Non-Agriculture base	89.6
Level of Education	
No Schooling	3.2
Up to Primary schooling	5.9
Up to O/L	71.4
Up to A/L	18.1
Graduated & Post-Graduate	1.3
Expenditure	
Food Expenditure	54.8
Non-Food Expenditure	46.6

HH-Household

Majority of the respondents in the sample were male (82.6%). Among the households, 89.6% of the households were non-agriculture base employees who were having educational qualification up to O/L with middle income (Table 1).

Outcome of Gini-coefficient Calculation

The food share that was calculated for each household was fed into Gini-coefficient calculation, which was based on the Lorenz

Curve constructed for this purpose of which the X-axis contains cumulative percentage of the food share of the sample and Y-axis contains cumulative percentage of the sample population. The value of Gini-coefficient that was obtained as 0.17 implies that the distribution of food share among households does not reflect a severe inequality (Figure 1).

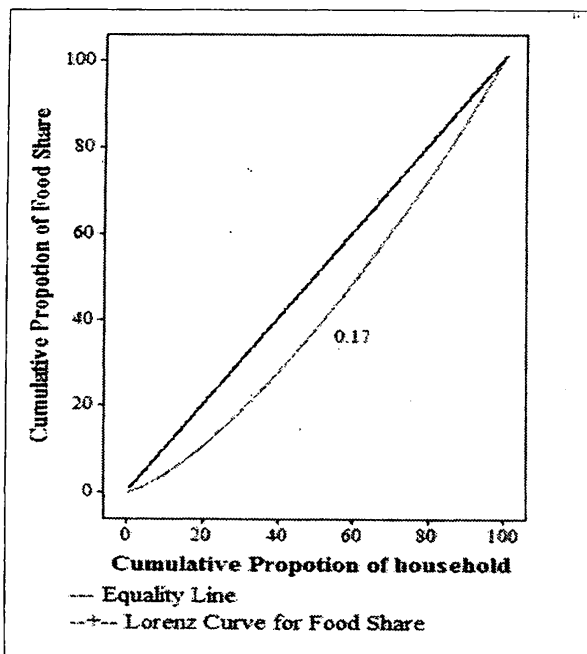


Figure 1. Lorenz Curve for food share of rural households

Percentage distributions of food share amongst households were summarized in Figure 2.

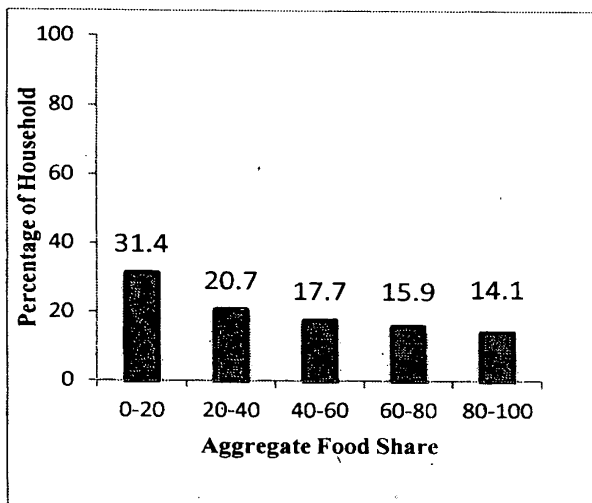


Figure 2. Percentage distribution of food share amongst the households

Aggregate food share of 20% represented by 31.4% households with lowest food expenditure while, higher level (above 80%) of aggregate food share represented by 14.1%

households with highest food expenditure (Figure 2).

Socio-economic data of the households having lowest and highest food share was shown in Table 2.

Table 2. Socio-economic data of the households vs. lowest and highest food share

Categories	Lowest Food share (%)	Highest Food Share (%)
Income (Rs.)		
<25,000	35.1	39.5
25,000-50,000	52.9	51.2
50,000-100,000	11.0	8.1
>100,000	2.1	1.2
Occupation		
Agriculture base	91.6	9.3
Non-Agriculture base	8.4	90.7
Level of Education		
No Schooling	8.9	0.0
Up to Primary Schooling	2.1	10.5
Up to O/L	65.9	68.6
Up to A/L	20.9	19.8
Graduated and Post-Graduate	2.1	1.2

Both lowest and highest food expenditure households with reference to Figure 2, most of the households have up to O/L educational level and Rs. 25,000-50,000 income level. But occupation of the household was changed food share (Table 2).

Among households, 91.6% of agriculture base employee with lowest food expenditure which have supplied food from household's gardens or household's own lands. Employee of non-agriculture base households (90.7%) has highest food expenditure which has supplied food from outside sources like super market.

Socio-economic Factors on Food Share Change

The Gini-coefficient values of food share among different socio-economic variables showed in Figure 3. Most of the socio-economic characters were shown an inequality distribution of food share.

Distribution of food share among female headed household was more inequality (0.25) than male headed households. Only 5.7% of females were no schooling households while, only 3% of male were not schooling. So that there was a variation based on food purchasing decisions among no schooling females and up to certain level schooling households. Distribution of food share in between average household size four was almost equal (nearly two) (Figure 3).

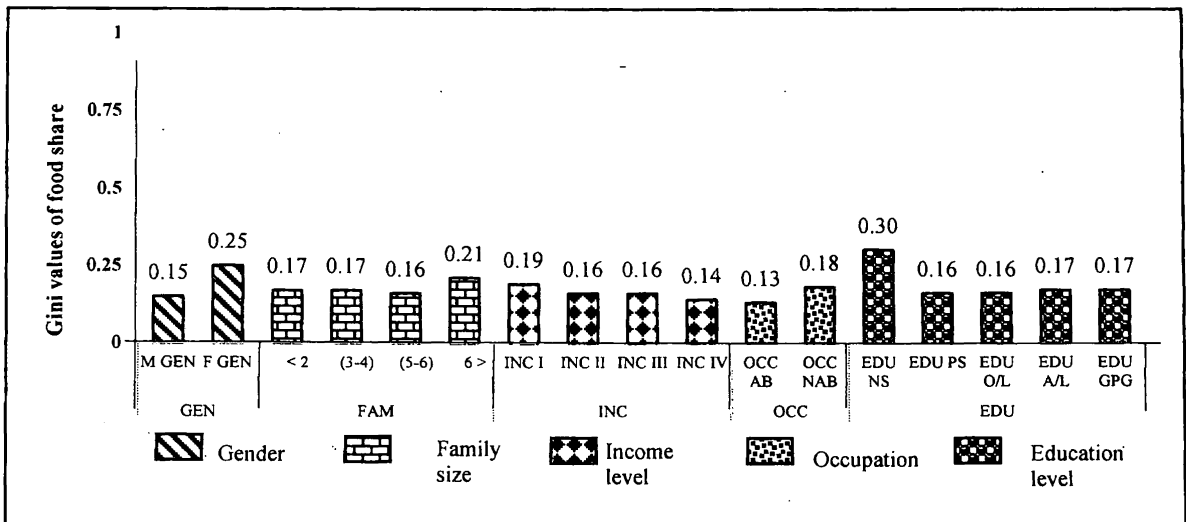


Figure 3. Food share Gini-coefficient value of different socio-economic variables. GEN- gender of the household head; FAM- family size; INC- income level; OCC- occupation; EDU- level of education; M GEN- male headed household; F GEN- female headed household; INC I-Rs. < 25,000; INC II-Rs. 25,000-50,000; INC III-Rs. 50,000-100,000; INC IV-Rs. >100,000; OCC AB-agriculture base occupation; OCC NAB- non-agriculture base occupation; EDU NS- No schooling; EDU PS- up to primary schooling; EDU O/L- up to O/L; EDU A/L- up to A/L; EDU GPG- Graduated and post-Graduate

When comparing food share Gini value (0.17) of the sample within income groups, higher inequality (0.19) distribution of food share resulted in lower income level (Rs. <25,000), while lower food share inequality (0.14) resulted in higher income group (Rs. >100,000). Regression analysis also proves that there was no any significant effect of income on food share. If there was income variation among households, adequate food was supplied.

When consider about level of education, no schooling households' food share more inequality (0.3) than up to certain level of educational households. Up to certain level of schooling households does not show severe inequality distribution, because households have knowledge about food safety.

Distribution of food among households based on occupation, an inequality of food share in agriculture base employee has less than non-agriculture base employee. Because agriculture base households have availability of food within household.

Outcome of the Multiple Linear Regression Analysis

Food share was changed with other socio-economic variables further analyze by the Multiple Linear Regression Analysis results were shown in Table 3.

Multiple Linear Regression result shows there were significant effect of gender and level of education on food share. Food purchasing decisions change with gender and education level of household. Other than that female more concern about nutrition value and safety than male.

Table 3. Results of the Multiple Linear Regression analysis

Predictor	Coefficient	P values
Gender	0.064**	0.001
HH size	-0.011	0.136
Occupation	0.019	0.419
Monthly Income	0.003	0.800
Level of Education	0.029**	0.009
Constant	0.466	0.000

HH-Household, **Significant at 0.05 level

The household size, occupation and monthly income not have significant effect on food share. If household have zero income, there was food share. As well as household's employee either agriculture or non-agriculture, households supplied food and it not affect from household size.

CONCLUSIONS

The study was aimed to assess the interrelationship between income and food share and examine the effect of socio-economic factors on food share.

The findings suggest that, distribution of food amongst the households does not show severe inequality. Other than that most of the socio-economic characteristics have shown an inequality distribution of food share. There was no relationship between income and food consumption. An inequality of food share was higher in low income group while, inequality low in high income group. And also, if household have zero income, there was an acceptable level of food share. That implies households have an acceptable level of food availability within household and the household food security was at the sufficient level.

Education level of the household and gender of the head of the household have significant effect on food share. When as monthly income, household size and occupations have no significant effect on food share.

ACKNOWLEDGMENTS

The authors express their sincere gratitude to all households participated to this survey to collect panel data and the National Science Foundation of Sri Lanka for providing financial assistance under its National Thematic Research Program of Food Security (2012-2016).

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