Households Demand for Food Commodities: Evidence from Kurunegala Divisional Secretarial Division, Sri Lanka

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Introduction

In Sri Lanka, as like in many of the world's poorest and developing countries one of the prime components of the final demand for food is household consumption. The food ratio which presents the total food expenditure as a percentage of total food and non-food expenditure was 42.3% of the total household expenditure in 2009/10 (Household Income and Expenditure Survey (HIES) – 2009/10, 2010/11). Changing prices, income, and other socio-economic factors have many implications on the demand of food commodities at household and country levels. Planning of food production or fixing of import targets necessitates an estimate of the prospective final demand for food commodities, which will generate requirements for increased supply through production or by imports. Hence, an analysis of household's consumption of food commodities on the basis of demand functions becomes necessary and useful.

A considerable number of empirical studies has been done in the field of consumer demand for food commodities, both in Sri Lanka and other countries (Ray, 1982; Cox and Wohlgenaut, 1986; Nirmali and Edirisinghe, 2010). However, literatures at micro-level which primarily focus on households demand for food commodities are not widely covered in the existing literatures. Hence, this study provides a useful inside information and knowledge that can be used by policy makers to set policies or design strategies related to food commodities. Complementing the existing studies, the present study will fill the gap by investigating the empirical realities of

the households demand for food commodities in the Kurunegala Divisional Secretarial (D.S) Division of the Kurunagala District in Sri Lanka.

Objectives

The main objective of this study is to identify and examine the factors that influence household's per capita consumption of food commodities in the Kurunegala D.S Division of the Kurunegala District of Sri Lanka. The study also aims at investigating the consumption pattern of food commodities by the households in the different sectors in the study area.

Methodology

This study was carried out in the Kurunegala D.S Division of the Kurunegala District in Sri Lanka. On the basis of the household distribution in the D.S Division, 64 households from the urban and 136 households from the rural sectors were selected randomly for a total of 200 samples. The required information were gathered by means of a structured questionnaire for the year 2013/14. The data on the consumption of the rice, wheat flour and bread, pulses, coconut, sugar, milk, fish, and meat were gathered for the study purpose. Each of these commodities is studied in relation to per capita income, own price, prices of the other commodities, and the household size in adult equivalent values. The total expenditure was used as a measure of income variable. The quantity and the value of food commodities consumed for a period of seven consecutive days were collected. The value of home produce consumed was imputed at market price prevailed in the area. Data on expenditure of the non-food items were collected during the 30 days period and one year period prior to the date of first visit depend on the nature of the item by recalling method. The weighted average prices were used for each food commodities and the possible quality effects from the weighted average prices of the food commodities were corrected by using quality adjusted prices (QAPs) to estimate the demand system (Cox and Wohlgenaut, 1986). The QAPs were calculated by adding the residual of the deviation from mean prices (DMP) regression with the average commodity prices (Cox and Wohlgenaut, 1986).

$$P_i^* = \propto_i + e_i$$

Where P_i^* denotes the QAP of the i^{th} commodity, $\propto_i$ denotes the mean price of the i^{th} commodity and e_i denotes the residual from the DMP_i regression.

The linear version of the Almost Ideal Demand System (AIDS) model (Ray, 1982) was used in the estimation of the demand system of food commodities. The AIDS model allows for a range of tests for consumer preferences (Delton and Muelbauer, 1980). The AIDS model could be represented as follows:

$$W_i = a_i + \sum_{j=1}^{8} a_{ij} \ln P_j + b_i \ln Y + O_i \ln S$$

Where W_i is the average budget shares of the i^{th} commodity, P_j is the price of j^{th} commodity is per capita expenditure, and S is the household size

The demand elasticity corresponding to the AIDS model are:

$$e_{ii} = [(a_{ii} - b_i w_i) / w_i] - 1 \quad \text{(Own price elasticity)}$$

$$e_{iy} = (b_i / w_i) + 1 \quad \text{(Cross price elasticity)}$$

$$e_{ij} = (a_{ij} - b_i w_j) / w_i \quad \text{(Real expenditure elasticity)}$$

$$e_{is} = (o_i - b_i) / w_i \quad \text{(Household size elasticity)}$$

Results and Discussion

Sectoral differences in the pattern of food consumption and mode of expenditure were observed in the study area. Per capita food expenditure as a percentage of per capita total expenditure was high in the rural sector at 62.86% and low in the urban sector at 49.5%. However, the absolute per capita expenditure on food commodities by the households was high in the urban sector than rural sector. It was also observed that the average propensity to consumption on food commodities diminished as income rises in both sectors.

The estimated own and cross price elasticity coefficients of the selected food commodities are shown in Table 1. With the exception of pulses and coconut in the rural sector; pulses, sugar and meat in the urban sector, the own price elasticity coefficients are statistically significant and negative. The own price elasticity coefficients are inelastic for the food commodities of rice, wheat flour and bread, coconut, and milk in the urban sector and rice, milk, wheat flour and bread and fish in the rural sector. The cross price elasticity coefficients of rice, wheat flour and bread, meat, and fish in the urban sector and rice, wheat flour and bread, pulses and fish are statistically significant and positive in most cases. This reflects the substitutability of the above food commodities. The cross price elasticity coefficients of number of food commodities, including milk and sugar in both sectors are statistically significant and negative. This implied the complementary effects.

Table 1: Matrix of Demand Price Elasticity Based on AIDS

Sector	Food Group	Rice	W& B	Pulses	Coconut	Sugar	Milk	Fish	Meat
Rural	Rice	-0.34	0.01	0.00[2]	0.02[1]	0.00[2]	0.13	0.09	0.00[1]
	W & B	0.53	-0.48	0.00[2]	0.00[2]	0.04	0.00[2]	0.00[1]	0.00[2]
	Pulses	0.05	0.01	-1.91[1]	0.00[2]	0.00[1]	-0.03[1]	0.00[2]	0.00[2]
	Coconut	-0.26[1]	-0.94[1]	0.00[2]	-0.83[1]	0.00[2]	0.00[1]	0.01	0.00[1]
	Sugar	0.00[2]	0.01	0.00[1]	0.09	-1.02	-0.15	0.00[1]	0.00[2]
	Milk	0.00[2]	0.00[2]	0.00[2]	0.00[1]	-0.39	-0.91	0.03	0.01
	Fish	-0.13	-0.02	0.01[1]	0.00[2]	0.00[2]	0.09	-0.72	0.39
	Meat	-0.08	-1.04[1]	0.00[2]	0.00[2]	0.00[2]	0.00[2]	0.55	-1.76
Urban	Rice	-0.62	0.24	0.10	0.00[1]	0.00[2]	0.00[2]	0.00[2]	-0.12
	W & B	0.48	-0.18	0.00[2]	-0.07	-0.01	0.00[2]	-0.01	0.00[2]
	Pulses	0.00[2]	0.03	-1.33[1]	0.00[2]	0.00[2]	0.00[2]	0.00[2]	0.00[2]
	Coconut	0.00[2]	-0.09	0.72[1]	-0.84	0.00[1]	0.00[1]	0.00[1]	0.00[2]
	Sugar	0.60[1]	-0.01	0.00[2]	0.00[2]	-0.62[1]	-0.05	0.05	-0.03
	Milk	-0.19	-0.04	0.00[2]	0.00[2]	-0.22	-0.63	0.17	0.13
	Fish	-0.06	-0.02	0.00[2]	0.00[2]	0.00[2]	0.14	-1.13	0.36
	Meat	-1.21[1]	-0.03	0.01[1]	0.00[1]	0.00[2]	0.09	0.65	-1.81[1]

[1.] Insignificant; [2.] Negligible value

Table 2 shows the estimated expenditure and household size elasticity coefficients. For all the commodities, except for pulses, the expenditure elasticity coefficients are statistically significant and positive in the urban

sector. For pulses in the urban sector, the expenditure elasticity is negative. Among the food expenditure elasticity coefficients, all, except meat in the urban and meat, fish, and milk in the rural sectors, are less than unity. This shows that meat, fish and milk in the rural and meat in the urban to be the highest ranking among food commodities in terms of households' income responses. The estimated household size elasticity coefficients suggested that increased household size induces a reallocation away from fish, meat, milk, and sugar to rice, wheat flour and bread in both the rural and urban sectors.

Table 2. Expenditure Elasticity and Household size Elasticity

Food Group	Expenditure Elasticity		Household size Elasticity	
	Urban	Rural	Urban	Rural
Rice	0.21	0.36	0.83	0.67
Wheat & bread	0.57	0.42	0.14	0.02
Pulses	-0.01	0.05	0.42 [1]	0.00[2]
Coconut	0.17	0.83	0.01 [1]	0.27 [1]
Sugar	0.11	0.18	-0.10	-0.12
Milk	0.98	1.48	-0.09	-0.10
Fish	0.74	1.01	-0.04	-0.34
Meat	1.19	1.22	-0.75	-0.60

[1.] Insignificant. [2.] Negligible value

Conclusion

The sectoral differences in the pattern of food consumption and mode of expenditure were found in this study. It noted that the proportion of income spent on food commodities diminished as income rises. The estimated elasticity coefficients of households demand for food with respect to own price, cross price, expenditure (income) and household size provide knowledge on the characteristic of food demand structure in addition to the framework to evaluate effect of policy changes in the different sectors focussed in this study. A change in price of a particular food commodity would result in the substitution effects among all other commodities. The extent of the adjustment can be varied with the relative price responses of the consumers and the relative shares of the commodity in the consumer's budget. A change in price has important policy implications because of its sizable influence on food budgets and allocation patterns. Since the change

in relative price of a commodity is associated with changes in demands for other food commodity categories, the policy makers should take into account consumers' adjustment to policy changes in their totality.

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