

Intrahousehold Food Allocation Behaviour of Up Country Tea Plantation Workers in Sri Lanka

R.M.D.P. KUMARI¹, K.G.M.C.P.B.GAJANAYAKE² AND G.A.P.CHANDRASEKARA³.

¹Department of Agri Business Management, Faculty of Agriculture and Plantation Management,

²Department of Plantation Management, Faculty of Agriculture and Plantation Management,

³Department of Applied Nutrition, Faculty of Livestock, Fisheries and Nutrition, Wayamba University of Sri Lanka, Makandura, Gonawila (NWP)

ABSTRACT

Malnutrition among plantation workers is a crucial problem today in Sri Lanka. Building up of a healthy and intelligent workforce for the nation is vital for the well being of the society. Adequate nutrition enhances physical health, thereby improves labour productivity. This Paper examines the patterns of food allocation among Up Country tea plantation workers, with a particular focus on gender differences. This paper aims to explore social and economic factors affecting the dynamics of household food allocation process. Calorie adequacy ratios of elders, fathers, mothers and children were compared to find out whether there was a difference of calorie allocation among family members. Relative calorie allocation of individuals was regressed with socio economic variables to find out the determinants of the intrahousehold calorie allocation. Results showed that there was a significant differences among calorie adequacy ratios of elders, fathers, mothers and children. Elders showed the lowest calorie adequacy ratio and fathers showed the highest calorie adequacy ratio. Regression results indicated that family size has significant negative impact on mothers relative calorie allocation. Economic position of women showed a positive effect on the food allocation among their children. Economic position of other members in a household has a positive effect on fathers and mothers relative calorie allocation. These results suggest that nutritional and economical support for women may reduce the risk of malnutrition of tea plantation workers in Up Country.

KEY WORDS: Labour productivity, Undernutrition, Calorie Adequacy Ratio, Relative Calorie Allocation

INTRODUCTION

Among the various challenges faced by the Sri Lankan plantation industry in recent years, the poor labour productivity of the estate sector has perhaps been the most significant. While the economics center on improve efficiency, enhancing product quality and stepping up capital investments, issues involving with social aspects are closely linked to improving the quality of life of the workers and their families. However, undernutrition is still a massive social problem in plantation sector (Wijesinghe & Wilfred, 2001). Furthermore, nutritional statistics showed disparities among different sectors in the economy and the highest percentage was shown by the estate sector. Nearly 34% of children and 58% of mothers were undernourished in the estate sector (Wijesinghe & Wilfred, 2001). Therefore, the focus of study goes to population living in estate sector. It is of great importance to understand intrahousehold food distribution in these regions. Finally, this will enable to eliminate malnutrition as well as to improve labour productivity and enhance the tea industry. Inequitable food distribution within the family creates hunger even when supply is adequate. The intrahousehold allocation of food within the household may exacerbate the effect of an inadequate household food supply on certain household members. In other cases, eventhough the household may have sufficient food to cover all its members requirements, some individuals may still suffer from undernutrition because of the pattern of distribution within the household (Seneur *et al*, 1988).

Gender differences in general have been found to be a relevant issue in most developing countries. It

is affected by intrahousehold food allocation processes (Bolin *et al*, 2001). While neoclassical economists modeled the household as maximizing a joint utility function, many recent studies provided evidences to reject the neoclassical utility model in favour of alternative models based on intrahousehold bargaining (Aldeman *et al*, 1995).

As a whole, women are the backbone of the estate sector and the social life. However, intrahousehold food allocation can lead poor health condition in women, which can result in less efficient work force which in turn gives low profitability in tea estate sector. It is important to understand intrahousehold food distribution in a community in order to implement effective nutritional intervention programmes which are aimed to decrease poor nutrition of the inhabitants. The intrahousehold allocation in developing countries has received increasing attention at present. However, the studies on intrafamily consumption behaviour is a less developed region in Sri Lanka. The specific goal of this paper is to examine whether there is a disparity in intrahousehold food allocation among up country tea plantation workers, using individual food consumption data. The discrimination hypothesis examines with the help of various socio economic variables as well as individual characteristics such as gender, age, education level, income and number of family members in a household.

METHODOLOGY

The data used in this research was collected through a household survey, which was conducted during February-May in 2005 in Nuwara Eliya and

Badulla districts in Sri Lanka. Two districts which shown higher labour percentage in tea plantation sector were selected purposively. Random samples were drawn from each district and one (Blairlombond) and three (Glen Alpin, Demodara and Thellbedda) estates were selected from Nuwara Eliya and Badulla districts respectively.

Individual food consumption and household characteristics were collected using a structured questionnaire. General household information such as income of father, income of mother and income of additional members in the family, education level of mother and father, gender, age and family size were obtained. Individual food consumption data for a 24 hour period were collected by recall. Data on intake of different types of food was converted into Calorie Intake (CI) using food composition tables. Recommended Daily Allowances (RDA) gives in (MRI, 1979) was used to calculate Calorie Adequacy Ratio (CAR) and relative calorie allocation (RCA). The ratio between CI and the RDA is known as CAR. CAR can be calculated for individuals and households. The individual's CAR (ICAR) is derived by dividing an individual's calorie intake (ICI) by his or her RDA.

$$ICAR = ICI / RDA$$

Household is defined as a group of individuals who reside together, pool all or most of their income and basically share the same food supply (Senauer *et al* 1988). In the plantation sector, the data source for this analysis, the household as defined above typically coincides with the nuclear family composed of a mother and father with their children and parents. The household CAR (HCAR) gives an idea about the average calorie intake when compared to the recommended levels for the entire household. The HCAR is derived by dividing the household total calorie intake (HCI) (sum of the individual calorie intake of all the family members), by total recommended daily allowances for the entire household (HRDA) (sum of the RDA of all the family members)

$$HCAR = HCI / HRDA$$

The basic dependent variable, RCA was derived by dividing the ICAR by the HCAR.

$$RCA = ICAR / HCAR$$

Socio economic factors used in the analysis were income of father, income of mother, income of additional members in household, education level of mother and father, age, gender, and family size. Statistical analysis was performed with SAS. ANOVA and mean separation were applied to test whether there is any significant differences among elders, fathers, mothers and children's CAR. To find out factors that effects significantly to intrahousehold food allocation multiple regression was used. (Senauer *et al*, 1988). To analyze the data four functional forms were carried out separately for elders, fathers, mothers and children.

Log-log model, Log-lin model, Lin-log model, Lin-lin model

According to the R² value best fitted model is liner model. Hence, Results are shown only for the liner model.

Model

$$Y = f(x_1, x_2, x_3, x_4, x_5, x_6)$$

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \beta_6 X_6$$

Y = relative calorie allocation
X1 = mothers income
X2 = fathers income
X3 = additional income
X4 = father education level
X5 = mother education level
X6 = family size

RESULTS

Table 1 shows the calorie adequacy ratios for specific groups of individuals in the survey sample. The overall average calorie adequacy ratio indicates individuals in the sample were getting only 73% of their RDA for calories.

In this sample, mean ICAR of elders, fathers, mothers and children were 69%, 81%, 72% and 71% respectively. The allocation of food favored specially male households. Husbands were fare substantially better than their wives in terms of calorie consumption.

Among elders, male ICAR (71) was greater than that of female (65). Among children ICAR of girls (69) was less than their counter parts (73). These results confirmed the discrimination against female in intrahousehold food allocation, as in other matters was often thought to be widespread and extreme. Girls above 16 yrs of age had lower ICAR than that of girls below 16 yrs.

Table 1. Calorie Adequacy Ratios of different groups in a household

Group	Total Observations	Calorie Adequacy Ratio	
		Mean	Standard Deviation
Overall average	249	0.73	0.12
Elders(>60)Male	14	0.71	0.02
Elders(>60)Female	10	0.65	0.03
Fathers	60	0.81	0.10
Mothers	60	0.72	0.01
Children	105	0.71	0.12
Girls mean		0.69	0.11
Girls(>16) yrs	21	0.66	0.07
Girls(<16) yrs	21	0.73	0.14
Boys(mean)		0.73	0.11
Boys(>16) yrs	31	0.72	0.92
Boys(<16) yrs	32	0.73	0.16

Furthermore, results indicated that there was a significant difference among mean values of ICAR of elders, fathers, mothers and children (P=0.0001). Fathers ICAR was significantly higher than that of others in the household.

Table 2. variables and Descriptive statistics of RCA , income and family size used in the regression

Variable	Mean	Standard deviation
Relative Calorie Allocation		
For fathers	1.08	0.02
For mothers	0.95	0.13
For elders	0.94	0.11
For children	0.98	0.10
Income of father	1200	1.26
Income of mother	1337	9.67
Additional income of other members	491.7	7.72
Number of family members in a household	4.150	1.260

Table 2 provides descriptive statistics for the variables utilized in the regression analysis. The first four means and standard deviations relate to the dependent variables used in the regressions. A mean value greater than one indicates that the average calorie adequacy ratio for fathers is typically above the adequacy ratio for the entire household. The calorie adequacy ratios for mothers, children and elders are below the level of entire household CAR, as indicated by a value less than one. The variation of wages about the mean value

Table 3. Regression Results of independent variables used in the regression

Independent Variable	Parameter Estimate	T for H0: Parameter	P-value
<i>Fathers model</i>			
Fathers income	0.000	4.25	0.0001*
Mothers income	-0.000	-1.14	0.2573
Additional income	0.000	2.50	0.0154*
Father-education level	-0.000	-0.00	0.9631
Mother-education level	-0.022	-1.5	0.1336
Family size	0.064	4.1	0.0001*
<i>Mothers model</i>			
Fathers income	0.000	1.73	0.0894*
Mothers income	0.000	0.67	0.5000
Additional income	0.000	2.12	0.038*
Father-education level	-0.027	-2.07	0.043*
Mother-education level	0.004	0.33	0.7407
Family size	-0.095	-5.98	0.0001*
<i>Elders model</i>			
Fathers income	-0.000	-1.46	0.1608
Mothers income	-0.000	-0.08	0.9347
Additional income	-0.000	-0.10	0.9180
Father-education level	-0.019	-0.49	0.6273
Mother-education level	0.012	0.35	0.7266
Family size	0.056	1.95	0.066**
<i>Children's model</i>			
Fathers income	-0.189	-2.11	0.0373*
Mothers income	0.000	2.02	0.0373*
Additional income	-0.000	-1.61	0.1088
Father-education level	-0.000	-2.63	0.0097*
Mother-education level	0.395	5.69	0.0001*
Family size	0.322	0.40	0.6844

* = significant at 5% significant level

**=significant at 10% significant level

is considerably greater for female than men as reflected by the larger standard deviation. However, fathers and mothers indicated approximately equal educational attainment. The average household contains approximately 4.15 members in a household.

Table 3 presents the regression results for elders, mothers, fathers and children. Fathers income has a positive impact on the father's RCA and mothers income has a positive impacts on her children's RCA. As the additional income rises both father and mother do relatively better. A more educated husband consumes a larger relative portion of the household supply on calorie. Hence, only mothers' education level have a significant impact on their children. The number of members in a household has a significant negative impact on her RCA and positive impact on elders RCA.

DISCUSSION

Males had a better food supply than females in almost all age groups. Gender and Age are important factors influencing intrahousehold food distribution in tea estates in Sri Lanka.

Sex disparities in intrahousehold food distribution have been indicated in many studies. The present study shows similar results for tea estate sector in Sri Lanka. Nelson¹² found that nutrient intake as a proportion of the RDA was higher for males than females. Based on a study in Philliphine, Nepal, China and Sri Lanka Seneur¹⁴, Gittelsohn³, Luo⁹ and Rathnayake¹³ concluded that males had a preferential food allocation.

Nelson¹² showed that intakes of energy and most nutrients by boys aged 0-10 years and girls under 5 years of age were more adequate than the intakes of other groups according to the RDA standard. The present study showed some similar results and stated intakes of calorie by boys >16 yrs and girls <16yrs were more adequate than the other groups.

The overall CAR (73%) of the present study is less than the CAR in urban poor in Kandy district (85%) (Rathnayake, 2002). This explains malnutrition rates of risk groups are higher in estate sector than urban poor in Kandy municipal area.

Regression results indicated that mothers income has a positive effect on the relative nutritional status of their children. Seneur¹⁴ and Kimhi⁷ also stated that women's income has a positive contribution to children's nutritional status. Fathers usually enjoy better food allocation than other members of the household. His RCA rises with his income and some additional income.

In this survey, RDA is not individually specific but applied to age and gender categories. They do not reflect possible differences in levels of physical activity or metabolic rates among individuals in an age and gender categories. Thus, this study does not provide detailed data on physical activity level which are necessary to adjust the calorie requirements of individuals. The collection of reliable data of the food consumption of individual household member is extremely difficult, time consuming and expensive. In our study, for instance, household and individual consumption were obtained by 1-day 24 hour recall method. Thus, day to day variations in food intake may have introduced errors in the estimates, although the consumption of high risk members relative to total

household consumption may not have a large day to day variation.

To ensure more reliable data, one would have to expand data collection beyond one 24 hour period to seven or more consecutive days. This would greatly increase costs and reduce the feasible sample size. Further more, efforts to weight all foods consumed by individual household members are likely to influence their actual consumption and considerably reduce the reliability of the data. The presence of the researcher during meals would also be likely to interfere in the normal table behavior during a family meal. Dietary recall, aided by the food models, is a less intrusive method. Adequate social preparation must take place, as was done in this survey, in order to ensure accuracy and representativeness of the visual intakes. Further studies on this line using larger samples to cover a number of geographical areas will be required to confirm these findings.

CONCLUSIONS

The study has examined factors which influence the allocation of food within tea plantation sector in Sri Lanka. This study showed an understanding of intrahousehold allocation is necessary to fully evaluate the effect on individuals of specific development projects which increase food availability. To be successful, food subsidy and nutrition improvement projects must consider the pattern of food distribution within the household. An important conclusion based on the regression analysis is income of mother and her education level has a significant positive impacts on the RCA of her children. An increase in the additional income increases fathers and mothers RCA but reduces the children's RCA. These results are consistent with either a joint household utility function model or a bargaining model.

A possible approaches to modify the pattern of intrahousehold resource allocation is to improve the employment opportunities and nutrition of women is recommended to improvement of nutrition security of the estate sector which improves labor productivity and enhance the tea industry.

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