ANALYSIS OF CONSUMPTION PATTERN OF FOOD AND NON FOOD ITEMS IN SOUTH SAURASHTRA AGRO-CLIMATIC ZONE

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ABSTRACT

The study was undertaken in Junagadh district of south Saurashtra agro-climatic zone. Primary data pertaining to the research study of food and non-food items including socio-economic characteristics, land holding, yield, income, etc. were collected through personal interview method with the help of pre-tested comprehensive interview schedule by survey method. The reference period for the study was the agricultural year 2015-16. A relatively higher proportionate expenditure on 'food' items in rural area and 'non-food' items in the urban area were observed in the present study. In TM & TF commodity groups, P form of the Engel function was selected as a best fitted function, whereas for TNF commodity group, L form was the best fitted. The elasticity of 'TM' commodity group was higher in rural sector as compared to urban sector in summer and monsoon seasons, except 'TM' in winter season. For 'TF' commodity group, elasticities were higher in rural sectors than urban sectors in all the three seasons. In 'TNF' commodity groups, the expenditure elasticity was higher in urban sector during winter and monsoon season.

KEY WORDS: Consumption pattern, Engel function, Expenditure elasticity, Rural and urban sector, food and non food items

INTRODUCTION

The economic status of a society or community refers to its position as to where it stands on the ladder of financial position. Most important determinants of economic status of a society are its per capita income, the standard of living, the level of consumption, *etc*. Different indicators of the levels of living presents the "Macro" as well as "Micro" level dimensions of the process of development. While per capita income and per capita consumption expenditure are some of the macro level indicators of development, the distribution of household expenditure is a micro level indicator. The standard of living of a household can be understood from the consumption pattern, and the quality of consumption budget clearly indicates the level of welfare of the household. Food consumption pattern of household is an important barometer of individual welfare and well-being in any country.

According to the Ministry of Statistics and Programme Implementation, Government of India, the all-India estimate

of average MPCE (Monthly Per Capita Expenditure) was around Rs.1430 for rural India and about Rs.2630 for urban India. Thus, average urban MPCE was about 84 per cent higher than average rural MPCE for the country as a whole, though there were wide variations in this differential across States (Anon., 2013). In India, average per capita availability of milk increased from 233 to 307 gm/day during the year 2004-05 to 2013-14. In Gujarat, it increased from 344 to 506 gm/day during the year 2004-05 to 2013-14 (Anon., 2014).

The analysis of consumption pattern is a pre-requisite of a planned economy so as to enable the planners to have a precise knowledge of the future demand of different commodities and to match supply with changing pattern of demand. However, several factors like household size, composition, occupation, level of income, price, habit, social customs, resource endowment and other socio-economic parameters influence the consumption pattern of the commodity. Therefore, it is logical to expect wide variation in consumer behaviour in different parts of the country.

MATERIAL AND METHODS

The study was undertaken in Junagadh district of south Saurashtra agro-climatic zone as this area was an unexplored in such type of detailed study. Data were collected separately for rural and urban sectors. The choice of the district should be deliberated, in the sense that, depending on operational convenience, it will provide a suitable background in term of agro-economic feature for examining inter-class difference in consumer household for various commodity groups. Primary data pertaining to the research study of food and non-food items including socio-economic characteristics, land holding, yield, income, *etc.* were collected through personal interview method with the help of pre-tested comprehensive interview schedule by survey method. The reference period for the study was the agricultural year 2015-16.

The selection of household was done by adopting a multistage random sampling design with tehsils (Talukas) in selected district as the first stage unit, town and villages within each tehsil as second stage units and households within selected town and villages as the third stage units. Total 240 (120 each of rural and urban sectors) households were included in the study. Data were collected for the expenditure on food and non food items (variables) as in Table 1.

Regarding the research problem, as is true in almost all such studies for cross sectional data, instead of using disposable income, total expenditure should be used as the independent variable and specific main commodity groups expenditure as the dependent variable. For further analysis, four new variables (main commodity groups) presented below in the tabular form in Table 2 were also included.

Engel function (Engel, 1857)

The Engel function can be expressed symbolically as:

$$\frac{Y_{ij}}{n_j} = f\left(\frac{X_j}{n_j}\right)$$

Where,

Y_{ij} = *The expenditure on* i^{th} *commodity group incurred by* j^{th} *household*

X_j = *Actual total consumer expenditure of the* j^{th} *household*

n_j = *Number of persons in the* j^{th} *household and*

f= indicate the functional form of the relationship

The type of Engel function was used are given in Table 3. The final selection of the Engel function was based on economic as well as statistical criteria. In economic criteria, the sign of the coefficient was considered, while in statistical criteria, top priority was given to the higher adjusted coefficient of multiple determination ($\bar{R}^2$). However, in cases of $\bar{R}^2$ was almost same

for some forms, the F value associated with $\bar{R}^2$ and the simplicity of the form was taken into part of consideration.

To obtain the estimate of expenditure elasticities, various Engel forms are available which can be used to fit the household consumer expenditure data. Engel function is generally fitted to household consumption expenditure with different income groups but it was experienced during the data collection that respondents were hesitated to provide their real income, hence to waive at reliable estimate, TOT is considered as proxy income for different households. The choice among different forms of Engel function is very important as different forms have different characteristics. Moreover, the expenditure elasticity estimates are very sensitive to a particular form of Engel curve. Therefore, in the present study, ten different forms of Engel function (Table 3) have been fitted to the available data.

Goodness of fit of the models (Montgomery et al., 2003)

To test the goodness of fit of the fitted models, the coefficient of determination (R^2) was calculated as under

$$R^2 = 1 - \frac{\sum_{i=1}^{n}(Y_i - \hat{Y}_i)^2}{\sum_{i=1}^{n}(Y_i - \bar{Y})^2} \text{ and}$$

$$\text{Adj.}R^2 = 1 - \frac{(n-1)(1-R^2)}{(n-k)}$$

Where,

R^2 indicates the amount of variation in dependent variable accounted due to the model.

To test the overall significance of the model, the F test was used.

$$F = \frac{R^2/k}{(1-R^2)/(n-k-1)}$$

Follows F distribution with [k, (n-k-1)] degrees of freedom

Where,

n = number of observations

k = number of independent variables

The individual regression coefficients were tested using the t test under the null hypothesis

$$t = \frac{b_i}{S.E.(b_i)}$$

t value with (n-k-1) degrees of freedom

where,

b_i is estimated i^{th} coefficient and

S.E. (b_i) is the standard error of b_i

The Chow test (Chow, 1960)

The Chow test was used to judge whether the estimated consumption function of rural is significantly different from the urban or not. For this purpose statistics F^* was calculated as follow:

$$F^* = \frac{\left[\sum e_p^2 - \left(\sum e_1^2 + \sum e_2^2\right)\right]/K}{\left[\sum e_1^2 + \sum e_2^2\right]/[n_1 + n_2 - 2k]}$$

Where,

$\sum e_p^2$ = *Unexplained variation due to pooled function*

$\sum e_1^2$ = *Unexplained variation due to regression analysis for rural sector*

$\sum e_2^2$ = *Unexplained variation due to regression analysis for urban sector*

n_1 = *Sample size for rural household*

n_2 = *Sample size for urban household*

k = *Number of parameter to be estimated (including intercept)*

RESULTS AND DISCUSSION

The average per capita monthly expenditure on 'food' and 'noon-food' items was worked out in order to determine the living standard of people in the study area. The average per capita expenditure on different commodity groups along with their relative share in total monthly expenditure

for rural as well as urban area for different seasons are presented in Tables 4, 5 and 6.

The average per capita monthly total consumer expenditure (PCTE) in urban area (₹ 4704.80) was observed more than the average PCTE of rural area (₹ 2668.27) in winter, and also PCTE of urban areas for summer (₹ 3901.40) and monsoon (₹ 5405.52) seasons were higher than PCTE of rural area for summer (₹ 3681.01) and monsoon (₹ 2836.34) seasons. This is possible, presumably because of the higher expenditure on non-food items in urban area as compared to rural area due to higher standard of living. Further, price difference of urban and rural could be taken to imply a narrowing down of the discernible differences.

Further examination of Table 4 revealed that the average per capita monthly consumer expenditure share of total milk and milk products and total other food (other than milk and milk products) items were relatively higher in rural areas as compared to urban area during winter season, whereas the share of total non-food items share was higher in urban areas as compared to rural area during winter season.

The urban consumer of South Saurashtra Agro-climatic Zone spent ₹ 619.04, ₹ 1080.90 and ₹ 3017.01for milk and milk products, other food items and non-food items, respectively in winter season. Total food items accounted about for 36.13 per cent of total consumer expenditure and remaining 63.87 per cent was accounted for non-food items in urban area during winter season. The corresponding figures for rural area were 63.11 and 36.89 per cent, respectively.

A relatively higher proportionate expenditure on 'food' items in rural area and 'non-food' items in the urban area were observed in the present study. This is quite expected and it is in agreement with the findings of Prasher *et al*. (1992). Higher expenditure on 'non-food' items in the urban area may be attributed to the higher average standard of living in this area.

In urban sector, non-food items shared more expenditure i.e. 63.87, 60.03 and 69.93 per cent than total 'food' items share *i.e.* 36.13, 40.18 and 30.13 during winter, summer and monsoon seasons, respectively (Tables 4, 5 and 6).

In rural area, total food items accounted for the higher expenditure *i.e.* 63.11, 74.31 and 67.25 per cent than non-food items shares *i.e.* 36.89, 29.34 and 33.51 per cent in winter, summer and monsoon, respectively. The most important food items with respect to proportionate expenditure on total food items in rural areas during winter season was liquid milk (17.89%) followed by cereal (13.07%), sugar & gur (7.78%), ghee (5.69%) vegetables (4.46%), spices (4.28%) pulses (3.49%), oil & fats per cent (3.19%), other milk products (1.57%), fruit (0.8%), non-veg items (0.67%) and beverages and non-beverages (0.46%).

The maximum ranking of food items in the urban area during winter season was liquid milk (8.71%), cereal (7.58%), sugar & gur (4.10%), vegetables (3.66%), other milk products (2.84%), spices (1.94%), pulses (1.79%), ghee (1.68%), fat & oils (1.45%), fruits (1.17%), non-veg items (0.66%) and beverages and non-beverages (0.45%). The expenditure on meat, fish, and egg was very low in both rural and urban areas. This may attribute to a higher vegetarian population in this zone and expenditure on beverages & non beverages was low as the Gujarat is dry state.

The average per capita monthly expenditure of different items in urban and rural areas in summer and monsoon seasons are presented in Table 5 & 6, respectively. These expenditures provided the almost same trend as was noticed in winter season. Thus, imparities in consumption of food and

non-food items were observed in the rural and urban households.

Different form of Engel function for different main commodity groups

The results presented in Table 7, 8 and 9 revealed that there is no single form of the equation for the commodity group either of season or area could be selected based on the criteria of adjusted $\bar{R}^2$. However, the set of the equations remained more or less same for all the six cases comprised of seasons and areas, with few exceptions. Thus, it was thought worth-while to search for a single form of the equation for a commodity in different seasons and areas based on economic and statistical criteria, which give the best results.

In Table 7, the results for 'TM' commodity group revealed that, ranking of $\bar{R}^2$ values in P form of the equation were ranked first in three cases out of six cases and third, seventh and tenth ranked in the remaining cases. In case where L ranked first, P form of equation ranked third with $\bar{R}^2$ values. In these two cases, the differences in $\bar{R}^2$ values between with L and P forms were marginal. Thus, it could be inferred that Engel function of P form is quite satisfactory and gave good fit in most of the cases and P form approximates the relationship between per capita specific commodity expenditure and per capita total expenditure for TM was quite well in general as compared to the other forms of Engel function.

For the 'TF' commodity group, as shown in Table 8, out of six cases, P form of Engle function ranked first in four cases and ranked third and sixth in the remaining two cases. In case where L ranked first, P form of equation ranked third with $\bar{R}^2$ values. In these two cases, the differences in $\bar{R}^2$ values between L and P were marginal. Thus, it could be safely concluded that Engel function of P is quite satisfactory and gave best fit in most of the cases and form approximates the relationship between per capita specific commodity expenditure and per capita total expenditure for TF was quite well in general as compared to the other forms of Engel function.

In case of 'TNF' commodity group (Table 9), L ranked first in three cases. On the other hand, SLI and LLI and LP form of equation ranked first in other three cases. The difference in $\bar{R}^2$ values between L and other three functions i.e. SLI, LLI and LP were found marginal. Thus, L form of equation could be selected as the best Engel form of equation in 'TNF'. The related results were also confirmed by Jain (1983) in rural areas of Haryana state. He revealed that linear (L) form in rural area was found to be most appropriate for food and non-food items.

In TM & TF commodity groups, P form of the Engel function was selected as a best fitted function, whereas for TNF commodity group, L form was the best fitted.

The values of the regression coefficients, adjusted coefficient of determination and calculated F values for the Chow test are presented for rural and urban sectors in Table 10. The results revealed that adjusted coefficient of determination ($\bar{R}^2$) ranged from 82.43 (summer) to 87.26 (monsoon) per cent in rural, while for urban, the range was 74.12 (summer) to 81.16 (winter) per cent in TM. These results suggested that during the different seasons, there may be other factors affecting the consumption of 'TM' more or less. These may be attributed to less availability of milk during summer season, difficult to transport during monsoon and demonetization of money during winter.

In relation to TF commodity group in rural area $\bar{R}^2$ value ranged from 86.83 (winter) to 94.12 (summer) per cent, whereas, for urban, it was 88.23 (winter) to 91.19 (summer) per cent. In this case too,

like 'TM', during all seasons, extraneous factors seem to cause the fluctuation in per head consumption expenditure on TF commodity group. In cases of 'TNF' commodity group, adjusted coefficient of multiple determination was quite high in urban sector as it ranged from 80.64 (summer) to 95.14 (winter) per cent, and it varied from 78.84 (summer) to 85.84 (winter) per cent in rural area. However, in general, the predictability coefficients were higher for TM & TF commodity groups in rural area and in case of urban, it was higher for TNF group.

Expenditure elasticities of main commodity groups for sample respondents in rural and urban sectors

The elasticities were calculated on the basis of the estimates of coefficients obtained from the selected Engel functions. The elasticities should be lies between 0 and 1. The item is termed as 'inferior' if its elasticity is negative and as 'luxury' if its elasticity is greater than unity.The estimates of Engel elasticities for different commodity groups in rural and urban sectors are presented in Table 11. The results revealed that the elaticities of 'TM' commodity group was higher in rural sector as compared to urban sector in summer and monsoon seasons, except 'TM' in winter season. The results also revealed that for 'TM' commodity group, the value of elasticities exceeded one in some cases. This in general, indicated the increasing demand for milk and milk products (TM) in rural and urban sectors of South Saurashtra agro-climatic zone. The present finding is akin to the results obtained by Singh and Singh (1971), Lata (1981), Jain (1983), Das *et al.* (2011) and Krishnadas *et al.* (2016). Contrary to the findings of Singh and Patel (1982) revealed that elasticities of milk and milk products were higher in urban than rural areas.

For 'TF' commodity group, elasticities were higher in rural sectors than urban sectors during winter, summer and monsoon seasons. In 'TNF' commodity groups, the expenditure elasticity was higher in urban sector during winter and monsoon seasons except in summer season. The forerunner deliberation leads to the conclusion that, more expansibility for food items were existed in rural areas as compared to urban areas, whereas, for urban areas, expenditure on total non-food (TNF) items expanded at higher rate with increasing income than rural sectors.

CONCLUSION

The average per capita monthly expenditure on total milk and milk products (TM) and total food (TF) were also relatively higher in rural area as compared to urban area. The percentages of average per capita monthly expenditure of TNF on TOT were relatively higher in urban area as compared to rural area. Whenever, percentage of per capita monthly expenditure of TM and TF on TOT was higher in rural area as compared to urban area. For both total milk (TM) and total food (TF) commodity groups, parabolic (P) form was found to be the best fit to define the relationship between per capita TM and TF commodity expenditure with per capita total expenditure (TOT). The form of equation was $P = Y_{ij} = a_i + b_iX_j + c_jX_j^2$. In case of total non-food items (TNF), Linear (L) form was found to be the best fit to define the relationship between per capita TNF commodity expenditure with per capita total expenditure (TOT). The form of equation was $L = Y_{ij} = a_i + b_iX_j$. Expenditure elasticities for total milk in monsoon season and total non-food items group of commodity in all the seasons exceeded than unity. This suggested that, the consumption expenditure on these items increased at increasing rate with respect to income. In case of milk and milk products (TM) and total food (TF) commodities group, the expenditure elasticities were higher in rural

households as compared to those in urban area, except in TM commodity group during winter season. The reverse was true for total non-food (TNF) except in summer season. This clearly revealed that increase in income resulted in relatively more diversion of expenditure towards food items in rural area than urban areas, while for total non-food items, more diversion of expenditure in urban area as compared to rural area.

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