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Socio-Demographic Profile and Dietary Diversity of Middle Income Households in the Rural-Urban Gradient of Bengaluru

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ABSTRACT

Socio-demographic study involves characteristics of population such as age, gender, education, occupation, income and expenditure pattern. Urbanization is the increasing share of a nation's population living in urban areas, which is generally happening as a result of net rural to urban migration. Demographic and socio-economic changes influence the life style, working culture and food consumption behaviour of the people. Present study investigated socio-demographic profile and dietary diversity among households in the rural-urban interface of Bangalore. From north and south regions of Bengaluru, 300 households comprising of rural (100), transition (100) and urban area (100) were selected. Standardized questionnaire was applied to elicit data on socio-demographic profile of household members. Household Dietary Diversity Scores (HDDS) are calculated by summing the number of food groups consumed at the household over 24 hour recall period. Majority of the family members belonged to middle age group (40%), nuclear family (60%) and small family size (50%). Across the rural- urban gradient significant changes were observed in family type ($\chi 2$ =7.86) and family size ($\chi 2$= 16.19*). Gender-wise distribution was equal and majority of them studied up to secondary school (23.7-28.3%). Agriculture was predominant occupation in rural (82%) as against urban with non-agriculture (88%). Mean expenditure for food and grocery items was maximum in all the three study areas and ranged from Rs.4550-5131per month. Significant difference in average monthly expenditure for household equipment (3.83*), communication (6.71*), recreation and culture (3.94*) restaurants and hotels (5.81*) and miscellaneous (9.89*) was observed across rural-urban gradient. Mean HDDS was slightly higher for urban (10.43) compared to rural (9.25). These findings exhibit the changing patterns in the socio-demographic characteristics and dietary diversity among the selected households as result of urbanization.*

Key words: *Rural-urban gradient, Socio-demographic profile, Dietary diversity, SES.*

INTRODUCTION

Among the different nutrition research categories such as food consumption, nutrient intake, disease prevalence which involves survey, an understanding of socio-demographics of population *viz.*, age, gender, ethnicity, education level, income, location, etc. plays a vital role in forming basis for understanding study group and to correlate with specific study objectives.

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Socio-economic status (SES) could be a measure of economic and sociological conditions of an individual's work expertise and of a person's or family's economic and social position in regard to different community members. Usually, income, education, and occupation area unit taken into thought to determine socioeconomic status. In most of the community-based scientific studies, assessment of the socioeconomic standing of an individual/family is a vital pre-requisite as several factors which are focused, directly or indirectly related to socioeconomic standing[4]. Urbanization is the increasing share of a nation's population living in urban areas (and thus a declining share living in rural areas). Most urbanization is the result of net rural to urban migration[3]. The city (urban) and the countryside (rural) together form the "city region" and are functionally related, though having completely different economies and land use patterns. They have their own spatial expansion but when they meet, they form a completely unique region which is characterized by mixed land use and evolves as a different cultural entity as well. The dynamic nature of the city compels it to sprawl beyond its boundaries and in this way, it gradually engulfs the surrounding countryside and annexes them with its own territories. It is here that the urban meets the rural and forms the "peri-urban interface"[5]. This can also be described as transition area.

The household dietary diversity scores (HDDS) is meant to reflect, in a snap shot form, the economic ability of a household to access a variety of foods. Studies have shown that an increase in dietary diversity is associated with socio-economic status and household food security.

Bengaluru is the capital city of Karnataka state, which is often referred to as "Silicon City" and has its growing urbanization influence on surrounding rural localities. With the hypothesis that increase in urbanization has its influence on changing socio-demographic profile of rural-urban gradient, present study was undertaken with the objective to investigate socio-demographic profile and dietary diversification among rural, transition (peri-urban) and urban (which represents different levels of urbanization) to understand changing characteristics in the north and south regions of rural-urban interface of Bangalore.

MATERIAL AND METHODS

1. Selection of area: Based on purposive random sampling, from north and south regions of Bengaluru, 300 households belonging to middle income group, comprising of rural (100), transition (100) and urban area (100) were selected. Total of 30 localities were covered under the study across the rural-urban gradient of Bangalore.

2. Data collection: A questionnaire was developed and tested in pilot study for its applicability. Necessary changes were made and questionnaire was standardized. This was finally applied to selected area to elicit information on:

a. Socio-demographic profile of households: name, gender, age, education, occupation, family income, family size, family type and expenditure pattern.

b: Household Dietary Diversity Score (HDDS): Dietary diversity is the sum of the numbers of different food groups consumed over a given reference period[8]. It is considered as indirect measure to household food security. Dietary diversity scores are calculated by summing the number of food groups consumed at the household over a 24 hour recall period. The data was collected from the respondent using structured questionnaire. Dietary diversity scores obtained, by following Food and Agriculture organization of the United Nations guidelines.

3. Statistical analysis: All the collected data was entered in master sheet designed in excel sheet and analysed with statistical tool of "analysis of variance" and "regression" to obtain results based on study objectives.

RESULTS AND DISCUSSION

Socio-economic status

Though the study objective was purposively on middle income group, based on

Kuppuswamy scale for socio-economic status further they are classified as lower and upper middle income group, for which chief earners education, occupation and total income of the family was considered. Most of the households belonged to lower middle income group both in north and south transects in all the three study areas across the rural-urban gradient. However, per cent of households belonging to upper middle income was more in urban in both the transects.

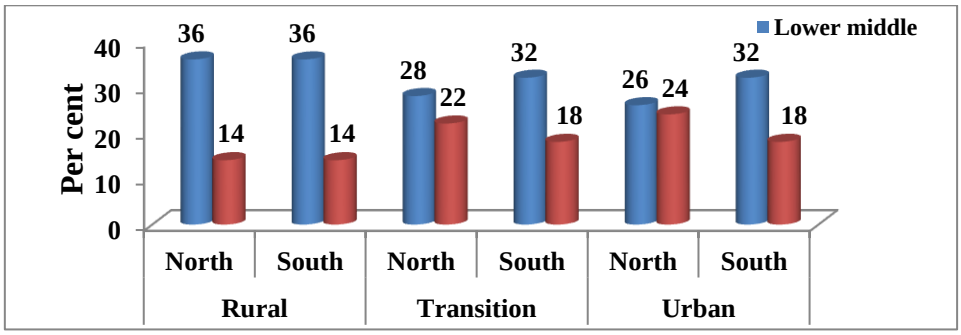

Fig. 1: Socio-economic status of households

According to a study conducted by Santoshi Kumari, *et al.*, 2016, on socio economic status of urban and rural families of Jammu district revealed that, majority of the families belonged to upper and lower middle socioeconomic status.

Demographic profile

Majority of the household members (39.8-43.2%) in the study area belonged to middle age group *i.e.* 20-40 years, followed by 41-60 years age group (20.9- 22.8%). Age-wise distribution of household members across the rural-urban gradient was statistically non significant.

Table 1: Socio demographic profile of Households (n= 300 households)

Variables	Rural	Transition	Urban	χ^2 Test
	%	%	%	
Age (years)				
1-4	4.9	4.9	4.7	
5-11	11.2	11.7	9.8	
12-19	12.0	11.0	12.3	
20-40	39.8	43.2	43.1	
41-60	20.9	22.8	22.8	
> 60	11.2	6.4	87.3	9.48 ^{NS}
Gender				
Male	50.5	51.2	49.1	
Female	49.5	48.8	50.9	0.36 ^{NS}
Education				
Illiterate	22.2	17.8	14.0	
Primary	23.4	23.5	25.3	
Secondary	23.7	27.7	28.3	
PUC/Diploma	13.1	12.9	12.1	
Graduate	8.8	9.9	12.0	
Postgraduate	1.1	1.2	2.3	
NA	7.7	7.0	6.0	16.16 ^{NS}
Occupation				
Government	1.1	2.4	3.8	
Private	10.3	9.4	15.5	
Self employed	7.1	15.7	20.3	
Home maker	17.6	22.5	24.8	
Unemployed	5.0	7.5	4.0	
Agriculture	26.0	7.3	1.0	
Student	21.5	20.4	22.3	
Daily wages	3.2	7.3	2.3	
<6	8.2	7.5	6.0	192.03*

* Significant at 5% level NS: Non-significant

A study conducted by Bowen *et al.*[2], on rural-urban migrants in India reported mean age of men and women sampled from Lucknow, Nagpur, Hyderabad and Bangalore was 42 and 40 years, with socio economic position similar in migrants and urban participants, but with considerably lower in rural participants. Male percentage was more in rural (50.5%) and transition (51.2 %) but in urban it was female (50.9%). Distribution of household members according to gender was statistically non-significant. Illiterates were more in rural **(**22.2%), percentage of graduates (12 %) and post graduates (2.3) was more among urban families. Most of them studied up to secondary school (23.7-28.3%) across rural urban gradient. Statistically no significant difference was observed for education among study households. Nagendra, 2107, reported socio-demographic factors of the urban population of Shivamogga, where among the literates, more than half of the participants were

studied up to PUC (pre-university course) and above (22.5%). Agriculture was the main occupation among rural families (26%), followed by homemakers (17.6 %), working in private firms (10.3%) and self employed (7.1%). Whereas in transition (22.5%) and urban (24.8%) majority of them were homemakers. Self employed were 15.7 per cent and 20.3 per cent in transition and urban respectively. People working in private firms were significantly more in urban (15.5%) compared to transition (9.4%) and rural (10.3%). Statistically significant difference was observed ($\chi 2$ =192.03*) for occupation across the rural-urban gradient. In a study on obesity among urban population of Shivamogga, most of the participants were home makers (32.5%), followed by unskilled workers (21.5%) and semiskilled (1.8 %) workers[7]. Involvement of women in income generating occupation such as dairy and agriculture was commonly observed in rural localities.

Existence of joint family structures in rural also supports for occupational involvement of women to support economic stability of the family. But in urban scenario nuclear family structure impose limitations on getting employed; hence in urban per cent of home makers was more compared to rural. In urban family members working in private and self-employed were more compared to rural.

Family Structure

More than 60 per cent of the households belonged to nuclear family in all the groups. Whereas joint family type was observed more in rural (39%) compared to transition (23%) and urban (24%). Grouping of households based on family type between three study areas was statistically significant ($\chi 2$ =7.86*). Percentage wise existence of small family (with 1-4 members in family) was more in urban (70%), followed by transition (67%) and rural (50%). About 45 per cent of rural households had 5-7 members in family (Medium size). Grouping of respondents based on family members had statistically significant ($\chi 2$= 16.19*) difference.

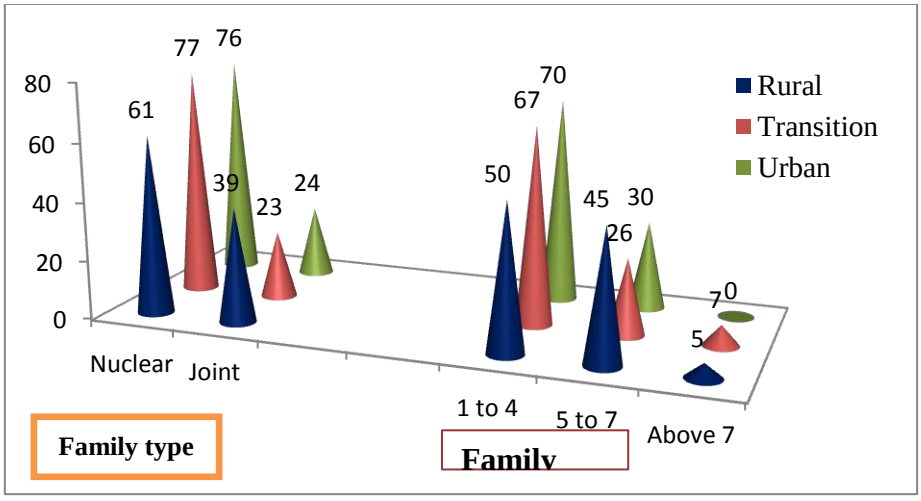

Fig. 2: Family structure of Households

Across the rural rural urban gradient In India joint family system was predominant since ancient times, however slowly joint family system has been slowly disintegrated, giving rise to the increase in nuclear family type. Job opportunities available in the cities become the main cause of disintegration of the joint families. There is lack of living space in the cities. It is difficult to accommodate all the members of a joint family in a single house in the city[1].

Household main occupation

Majority of the rural households (82%) dependent on agriculture as their main occupation followed by transition (32%). Whereas 88 per cent of households in urban dependent on non- agriculture based occupation. Majority of the rural households (38%) had agriculture land of 1.1-3.0 acres, whereas as in transition most of them (17%) had ≤ 1 acre. In rural most of the households are involved in agriculture as it is the major sources of income for them.

Table 2: Classification of households based on main occupation of households and landholdings (n= 300 households)

Variables	Rural (n=100)	Transition (n=100)	Urban (n=100)	Test
	%	%	%	
Occupation				
Non Agriculture	18.0	68.0	88.0	
Agriculture	82.0	32.0	12.0	106.73*
Land holding				
No holding	18.0	68.0	88.0	
≤ 1 acre	32.0	17.0	6.0	
1.1-3.0 acres	38.0	13.0	4.0	
> 3.0 acres	12.0	2.0	2.0	60.51*

* Significant at 5% level, NS: Non-significant

Where as in transition areas land holding was less compared to rural households due to involvement in business and agricultural lands have been sold out for layouts. Another major challenge to the viability of both urban and transition agriculture is land availability due to changing land rights, uses and values.

Expenditure pattern:

Average monthly expenditure pattern of households in rural-urban interface presented in table 3. Maximum expenditure of households was for food and grocery and ranged from Rs.4550-5131, followed by expenditure for education (Rs.2193-2584), however statistically non-significant difference was observed across the gradient. Expenditure on household equipment's was more in urban (Rs.1085) than transition (Rs.877) and rural (Rs. 664).

Table 3: Average monthly Expenditure Pattern of Households (n= 300 households)

No.	Aspects	Rural (n=100)		Transition (n=100)		Urban (n=100)		'F' Test
		Mean (Rs)	SD (Rs)	Mean (Rs)	SD (Rs)	Mean (Rs)	SD (Rs)	
1	Food & grocery items	4550	2060	5131	2827	4735	2096	1.59 ^{NS}
2	Clothing	995	1033	1108	2099	979	932	0.23 ^{NS}
3	Education	2584	4198	1919	2954	2193	2441	1.04 ^{NS}
4	Household equipments	664	756	877	1234	1085	1174	3.83*
5	Health	718	1192	574	777	730	918	0.79 ^{NS}
6	Transport	1035	993	1326	1159	1333	1397	2.03 ^{NS}
7	Communication	943	892	1120	1117	1483	1164	6.71*
8	Recreation & culture	82	214	236	656	241	424	3.94*
9	Alcoholic beverages	30	300	21	125	144	740	2.17 ^{NS}
10	Restaurants & hotels	242	534	308	474	509	701	5.81*
11	Miscellaneous	532	601	604	832	1013	996	9.89*
	Overall	12374	6307	13222	7877	14447	6873	2.13 ^{NS}

* Significant at 5% level, NS: Non-significant,

Expenditure on communication such as mobile phone bills, newspaper and television was significantly more ($\chi 2$=6.71*) among urban (Rs.1483). Urban households (Rs.241) spend more for recreation and culture than rural (Rs. 82). Food consumption in restaurants and hotels is more in urban (Rs. 509) than rural (Rs.242). Money spent on miscellaneous aspects was observed to be in increasing trend towards urban. Expenditure pattern was statistically significant for household equipments ($\chi 2$=3.83*), Communication ($\chi 2$=6.71*), Recreation & culture ($\chi 2$=3.94*), Restaurants & hotels ($\chi 2$=5.81*) and Miscellaneous ($\chi 2$=9.89*). Overall expenditure was more in urban households, which is obvious due to the high cost of living in city areas. If the society is wealthy proportionately high expenditure will be made on secondary necessities, comfort, luxury products and conspicuous consumption. On the other, if the society is at subsistence level people will spend more on food. Accordingly in the present study urban expenditures on equipments, communication, recreation, culture, restaurants and miscellaneous was more compared to rural, which was gradually increasing from rural to urban along the transition phase, which may be correlated to the more per cent of upper middle income households in transition(18-22%) and urban(18-24%) compared to rural(14%).

Household Dietary Diversity Scores (HDDS)

Mean household dietary diversity scores (HDDS) in the households of rural-urban interface of Bengaluru is presented in Table 4. Results revealed that cereals and legumes which are nutritionally carbohydrate rich and good sources of protein; oils and sweets (mainly in terms of sugar) as energy contributors consumed by almost all the households. Whereas protective foods consumption such as vitamin A rich vegetables (pumpkin, bell peppers, carrots, tomato *etc.*), green leafy vegetables, vitamin A rich fruits (mango, papaya, melons *etc)* other fruits and other milk products (paneer, cheese, milk based sweets etc.) consumption is in increasing trend towards urban households.

Table 4: Household Dietary Diversity Scores in Rural-Urban Interface of Bangalore (n= 300 households)

Food groups	Mean dietary diversity scores		
	Rural (%)	Transition (%)	Urban (%)
Cereals	100	100	100
Legumes, Nuts, Oil seeds	97	100	100
Vitamin A rich Vegetables	26	39	39
Root and tubers	74	51	63
Green leafy vegetables	32	52	55
Other vegetables	74	82	87
Vitamin A rich fruits	11	14	22
Other fruits	21	37	40
Eggs	8	11	12
Meat	1	0	3
Flesh Meat	12	13	8
Fish	1	2	3
Milk and Curd	100	100	100
Oils	100	100	100
Sweets	100	100	100
Spices, condiments, beverages	100	100	100
Other Milk Products	11	22	25
Fats (Ghee Butter)	45	62	63
Other foods	12	22	23
Total mean HDDS	**9.25**	**10.07**	**10.43**

It can also be noticed that other foods such as outside foods or junk foods inclusion was more in number of urban households. Mean HDDS was slightly higher for urban (10.43) compared to rural (9.25).

Mean household dietary diversity scores (HDDS) in the rural-urban gradient represent average number of food groups consumed by households in the past 24 hour recall during survey. Dietary diversity scores are given against 19 prelisted food groups which are consumed on daily basis, which is in accordance with FAO (2013). Many studies reported higher HDDS scores with nutrition adequacy and food security among households. In the present study main difference in the consumption of high value foods such as fruits and vegetables, other milk products and egg was observed across rural-urban gradient. Rao and Joshi indicated that expanding urbanization together with higher economic growth and changes in the tastes and preferences are causing a shift in the food basket in favour of high value food commodities like fruits, vegetables, milk, meat, egg and fish. These changes in the food basket leading to transformation of the agricultural production portfolio away from food grains towards high-value food commodities. However consumption of meat by more number of rural (12) households than urban (8) in present study may be attributed to livestock possession by rural households.

Table 5: Regression analysis of variations affecting dietary diversity score across rural-urban interface

Regions	Variables		
	SES	**Family size**	**Education**
North			
Rural	1.89**	(-0.11)^{NS}	0.18^{NS}
Transition	1.54**	(-0.14)^{NS}	0.04^{NS}
Urban	0.73^{NS}	(-0.05)^{NS}	0.46**
South			
Rural	1.75**	0.03^{NS}	0.41**
Transition	0.79^{NS}	(-0.37)**	0.09^{NS}
Urban	1.08*	(-0.06)^{NS}	0.11^{NS}

** Significant at 1 % level, * Significant at 5% level, NS: Non-significant

A regression analysis of contributing factors for changing HDDS was done. For which socio-economic status, family size and education of women respondents was considered. Results revealed that socio economic status has positive correlation with HDDS, which reveals upper middle class households had more mean HDDS than lower middle, which was statistically significant among all the study areas except for north urban and south transition. Family size was negatively correlated which defines increase in number of family members has decreased HDDS. However these findings are statistically significant only among south transition households. Education of women had positive correlation with HDDS and exhibited statistically significant difference in north urban and south rural areas.

CONCLUSION

Socio-demographic profile of households across rural urban gradient indicated, agriculture is the main occupation in rural, whereas in transition and urban households are dependent on non-agriculture based occupations. Expenditure pattern of urban households on secondary necessities is more compared to the rural. Though rural family structures are slightly declining towards nuclear and small family size, extent is not similar to the urban scenario. Inclusion of high value foods such as fruits and vegetables, other milk products and egg was more in number of urban households compared to rural which exhibited difference in HDDS. Socio-economic status is the significantly contributing factor for the mean HDDS. The findings collectively exhibit changing patterns

of socio-demographic profiles and their relationship with dietary diversity of households across rural-urban gradient of Bengaluru.

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