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# Demographic analysis and the utilization of the acid lime for household, in the district of Vijayapur district of Karnataka

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**Abstract**

The study highlights significant socio-economic differences between rural and urban households, influencing education, occupation, income and consumption patterns. In education, rural areas had a higher illiteracy rate (18.00%) compared to urban areas (6.00%), where 18.00% of respondents attained graduate-level education. Age distribution varied, with 53.33% of urban respondents under 30 years, while rural areas had a higher proportion of middle-aged individuals (50.00%). Family structure differences were evident, as 80.00% of rural households followed the joint family system, whereas 73.33% of urban households lived in nuclear families. Occupational disparities showed that 59.33% of rural respondents engaged in agricultural labour, while 48.67% of urban respondents held jobs. Income levels also varied significantly, with 46.67% of urban households earning Rs. 50,001-1,00,000 annually, whereas 46.00% of rural households earned Rs. 5,000-25,000. The study also analysed acid lime utilization patterns, revealing differences in maturity stage preferences and forms of use. Most rural (76.67%) and urban (73.34%) respondents preferred light green limes due to their extended shelf life. However, urban households exhibited a greater preference for yellow-stage fruits (19.33%) compared to rural households (8%). Juice preparation was the most common form of consumption, with 90% of rural households and 46.67% of urban households using acid lime for this purpose. Urban households showed a slightly higher inclination toward processed lime products (2.67%). These findings underscore the socio-economic and consumption variations between rural and urban populations, shaped by accessibility, cultural habits and economic factors.

**Keywords:** Demographic analysis, acid lime utilization, rural households

## Introduction

The Kagzi lime variety from Vijayapura district has been granted a Geographical Indication (GI) tag, acknowledging its uniqueness and significance (Prakash, 2023) [13]. Within the district, Indi taluka dedicates 4,681 hectares to cultivation, producing 107,601 metric tons with a productivity of 22.98 metric tons per hectare. Comparatively, Sindagi taluka cultivates 1,496 hectares, yielding 31,592 metric tons with a productivity of 21.11 metric tons per hectare (Government of Karnataka, Department of Horticulture, 2021). The limes from this region are highly valued by the food processing industry for their large size, rich juice content, strong acidity, high ascorbic acid levels and extended shelf life. So, the present study aims to offer a comprehensive view of acid lime by these socio-economic disparities influence food consumption patterns, including the utilization of acid lime. Preferences for maturity stages and forms of consumption vary between rural and urban consumers, reflecting their accessibility, cultural habits and economic constraints. This study explores these variations to understand the underlying factors influencing household choices.

## Materials and Methods

The study was conducted during 2023-24 in Vijayapura district of Karnataka, with the purpose to study the Multi-level appraisal on processing and utilization of acid lime fruits in Vijayapura district. The data collection and the observation of the survey collections are depicted below:

### Operationalization and measurement of independent variables

### Education

Education was operationalized as formal schooling undergone by the respondents. A score of one was given for primary, middle school, high school and pre-university each year of formal schooling completed. Further, the respondents were grouped into six categories based on the procedure followed by Hinge (2013) [11].

| Categories | Education level | Score |
|---|---|---|
| Illiterate | Do not read and write | 0 |
| Primary school | 1st to 4thStd | 1 |
| Middle school | 5th to 7thStd | 2 |
| High school | 8th to 10thStd | 3 |
| Pre-university | 11th and 12thStd | 4 |
| Graduate and PG | Degree and PG | 5 |

**Age**

Age was operationalized as the chronological age of the respondents in completed years at the time of investigation. The age of the respondent was recorded as mentioned in completed years. The respondents were classified into three categories *viz*., young, middle and old as followed by Hinge (2013) [11].

| Categories | Age in years |
|---|---|
| Young | 18-30 |
| Middle | 31-50 |
| Old | 51 and above |

**Type of family**

Family size was operationalized as the total number of members residing in the family of the respondents. Type of family was categorized as nuclear and joint. The procedure followed by Hosamani (2006) [12] was adopted. The responses were expressed in frequency and percentage.

| Categories | Score |
|---|---|
| Nuclear | 1 |
| Joint | 2 |

**Occupation**

**a. Occupation for the households**

The Occupation of the respondents were categorized as per the researcher's needs and is categorized into agriculture. labourers, home makers and job holders. This was interpreted as follows.

| Categories | Score |
|---|---|
| Agril. labour | 1 |
| Home makers | 2 |
| Job holders | 3 |

## Results and Discussion

**Demographic profile of households**

The demographic profile highlights significant socio-economic differences between rural and urban households. In education, 18.00% of rural respondents were illiterate, 18.67% completed primary school and 40.67% attained middle school education, whereas only 6.00% of urban respondents were illiterate, with 32.67% completing Pre-University Course (PUC) education and 18.00% being graduates or above. Age distribution shows that 53.33% of urban respondents were under 30 years old, compared to 28.67% in rural areas, while 50.00% of rural respondents were middle-aged (31-50 years). Family structure differed significantly, with 80.00% of rural households living in joint families, whereas 73.33% of urban respondents resided in nuclear families. Occupational patterns varied, as 59.33% of rural respondents were engaged in agricultural labour, while 48.67% of urban respondents held jobs. Income disparities were notable, with 46.00% of rural households earning Rs. 5,000-25,000 annually, whereas 46.67% of urban households earned between Rs. 50,001-1,00,000. Additionally, 33.33% of urban households earned over Rs. 1,00,000, compared to only 8.00% in rural areas. These variations reflect the broader socio-economic divide between rural and urban populations. The data revealed notable differences between rural and urban households are presented in Table 1.

Socio-economic differences between rural and urban households arise due to education, employment and lifestyle variations. Urban areas offer better educational facilities, resulting in higher literacy rates and more graduates, while rural households rely on agriculture with limited job diversity. Higher income opportunities in cities attract younger individuals, shifting the age distribution. Urban families prefer nuclear setups, whereas rural areas maintain joint family traditions. Industrialization, technological advancements and financial growth contribute to urban prosperity. Government schemes, better healthcare and migration trends further widen the gap (Alozie, E.N. and Isiwu, 2020) [1]. Rural communities face lower wages, seasonal employment and fewer financial opportunities, reinforcing economic disparities (Vasant and Ramesh, 2015 [10]). The results matching past studies conducted by Kumar *et al.* (2017) [4], that highlight the widespread consumption of citrus juices. in terms of form, the consumption of acid lime juice was dominant, with 90 per cent of rural households favoring it, significantly higher than the 46.67 per cent observed in urban areas (Nagayyanavar *et al*., 2020 [6]). Additionally, 8 per cent of rural households and 4 per cent of urban households consumed acid lime in the form of cut pieces.

**Table 1:** Distribution of demographic profile of households (N=300)

| Sl. No. | Particulars | Rural ($n_1$=150) | | Urban ($n_2$=150) | |
|---|---|---|---|---|---|
| | | f | % | f | % |
| **Education** | | | | | |
| 1. | Illiterate | 27 | 18.00 | 6 | 04.00 |
| 2. | Primary school | 28 | 18.67 | 9 | 6.00 |
| 3. | Middle school | 61 | 40.67 | 28 | 18.67 |
| 4. | High school | 10 | 06.67 | 31 | 20.67 |
| 5. | PUC | 15 | 10.00 | 49 | 32.67 |
| 6. | Graduate and above | 09 | 6.00 | 27 | 18.00 |
| **Age (years)** | | | | | |
| 1. | Less than 30 (Young) | 43 | 28.67 | 80 | 53.33 |
| 2. | 31-50 (Middle) | 75 | 50.00 | 43 | 28.67 |
| 3. | 51-60 (Old) | 32 | 21.33 | 27 | 18.00 |
| **Type of family** | | | | | |
| 1. | Joint | 120 | 80.00 | 40 | 26.66 |
| 2. | Nuclear | 30 | 20.00 | 110 | 73.33 |
| **Occupation** | | | | | |
| 1. | Agril. labour | 89 | 59.33 | 15 | 10.00 |
| 2. | Home makers | 37 | 24.67 | 62 | 41.33 |
| 3. | Job holders | 24 | 16.00 | 73 | 48.67 |
| **Annual income (Rs.)** | | | | | |
| 1. | 5,000-25,000 | 69 | 46.00 | 10 | 6.67 |
| 2. | 25,001-50,000 | 51 | 34.00 | 20 | 13.33 |
| 3. | 50,001-1,00,000 | 18 | 12.00 | 70 | 46.67 |
| 4. | More than 1,00,000 | 12 | 08.00 | 50 | 33.33 |

f – Frequency, % - Percentage

**Utilization of acid lime by households**

The utilization pattern of acid lime by rural and urban households is presented in Table 2. Regarding the maturity stage, most rural households (76.67%) and urban households (73.34%) preferred light green acid limes, likely due to their longer shelf life and suitability for various uses. A smaller proportion of rural respondents (15.33%) and urban respondents (7.33%) used green acid limes. In contrast, urban households showed a higher preference for

fully ripened yellow-stage fruits (19.33%) compared to rural households (8%), possibly due to taste preferences and easy availability. Additionally, 11.33% of rural and 20.67% of urban respondents used light yellow acid limes.

In terms of form, juice was the most common usage, with 90% of rural households and 46.67% of urban households using acid lime for juice preparation. This difference may stem from the traditional use of fresh lime juice in rural areas, while urban consumers may have more alternatives, including packaged juices. Cut pieces were used by 8% of rural and 4% of urban households, reflecting differences in culinary habits. Interestingly, no rural respondents reported using powdered acid lime, whereas 2.67% of urban households did, likely due to easier access to processed products in urban markets. These results indicate significant variations in both the maturity stage preference and utilization form of acid lime between rural and urban households (Alozie, E.N. and Isiwu, 2020) [1].

The differences in acid lime utilization between rural and urban households arise from factors such as shelf-life preference, market accessibility and traditional practices. Rural households prefer light green limes for longevity, while urban consumers favor ripened fruits due to frequent market access (Alozie, E.N. and Isiwu, 2020) [1]. Urban areas offer processed products like powdered lime, while rural households primarily use fresh juice for health benefits (Mavinalli *et al*., 2024 [5] in Guva, Singh and Shrama, 2018 [7]). Storage facilities, economic considerations, culinary habits and time constraints further influence these choices, reflecting distinct consumption patterns and lifestyle differences. These variations suggest distinct utilization patterns between rural and urban households (Table 2), with juice being the most common form, but urban households displaying a wider range of preferences in both the maturity stage and form of use, this is in line with Singh and Shrama (2018) [7] found that both rural and urban households primarily prefer acid limes in the light green stage, with rural households showing a stronger preference for lime juice, while urban households exhibit more varied preferences in both the maturity stages and forms of consumption (Tesfaye, 2024) [9].

**Table 2:** Acid lime utilization pattern by households (N=300)

| Sl. No. | Utilization | Rural ($n_1$=150) | | Urban ($n_2$=150) | |
|---|---|---|---|---|---|
| | | f | % | f | % |
| **Maturity stage** | | | | | |
| 1. | Green | 23 | 15.33 | 11 | 7.33 |
| 2 | Light green | 115 | 76.67 | 110 | 73.34 |
| 3 | Yellow | 12 | 8.00 | 29 | 19.33 |
| 4 | Light Yellow | 17 | 11.33 | 31 | 20.67 |
| **Form of use** | | | | | |
| 1. | Cut piece | 12 | 8.00 | 6 | 4.00 |
| 2. | Powder form | 0 | 0.00 | 4 | 2.67 |
| 3. | Juice | 135 | 90.00 | 140 | 46.67 |

Multiple responses are possible, f – Frequency, % - Percentage

## Conclusion

The study highlights significant socio-economic differences between rural and urban households, influencing education, occupation, income and consumption patterns. Rural areas had lower literacy levels, a higher prevalence of joint families and a greater reliance on agriculture, whereas urban households had better educational attainment, nuclear families and diverse job opportunities. Income disparities were notable, with urban households earning significantly more than rural ones. These variations also influenced acid lime utilization patterns, with rural households favouring fresh juice and urban households showing a preference for processed forms. Overall, the findings emphasize the impact of socio-economic factors on household choices and consumption behaviour.

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