

Spatial and Temporal Analysis of Decision-making Behaviour of Agricultural Households in the Rural Urban interface of Bangalore

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ABSTRACT

The present study was carried out in rural, transitional, and urban gradients of Bangalore North and South transect from 2017 to 2019 for studying the spatial and temporal analysis of decision-making behavior of agricultural households on agriculture and house-related activities. Eighty, 120, and 100 agricultural households from urban, transitional, and rural gradients were selected for the North transect study. In contrast, 85, 115, and 100 agricultural households from urban, transitional, and rural gradients were selected in the South transect of Bangalore. The data was collected from the same agricultural households using the same schedule during 2017, 2018, and 2019. Personal interviews and focused group discussion was carried out to collect relevant data from both the head of the family and his spouse. A vast majority of the agricultural households of rural, transitional and urban gradients belonged to the good to better decision-making category in respect of agricultural and household activities. There was a non-significant difference in mean decision decision-making scores among agricultural households in rural, transitional and urban gradients over three years from 2017 to 2019. Education, occupation, farming experience, employment opportunities, annual income, innovative proneness, mass media participation, and extension participation of agricultural households of rural, transitional and urban gradients had a positive and significant to a highly significant relationship with their decision-making behavior in respect of agriculture and household-related activities.

Keywords: Agricultural households, Decision-making, Rural-urban interface, Transects, Bangalore

Agricultural production is a decision-intensive process, and it is directly influenced by the decisions taken by the farming community and other stakeholders. Understanding the production management practices more thoroughly requires understanding how the farmers think, what they know, what matters to them, what attracts their attention, how they organize information and the feelings that underlie their decision-making processes. Farmers decide to cultivate crops by making decisions themselves or in consultation with their family members. In this backdrop, the present study is taken up with the following objectives:

- ♦ To study the spatial and temporal analysis of decision-making behavior of agricultural households on agricultural and household activities in the rural-urban interface.
- ♦ To find out the relationship of profile characteristics of agricultural households in

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the rural-urban interface with their decision-making behavior in agricultural and household activities.

METHODOLOGY

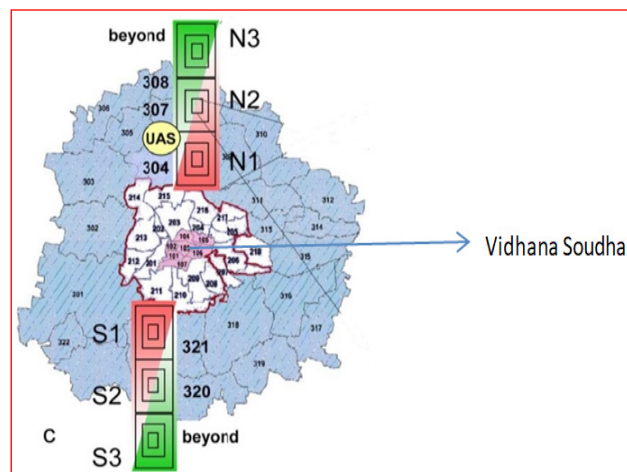
Locale of the study

The study was carried out in North and South transects along with the rural-urban interface of Bangalore from 2017 to 2019. The Northern transect (N) and the Southern transect (S) of Bangalore cover an area of 250 km² and 300 km², respectively. Each transect covers a rural-urban gradient, with the northern end of the S-transect and the Southern end of the N-transect representing urban Bangalore and reaching into the rural space around the megacity.

The Northern transect (N) extends along the National Highway NH7 towards the new international airport, with the research areas are designated as N1 (urban gradient), N2 (transitional gradient), and N3 (rural gradient). The distance from Vidhana Soudha, Bangalore (City center) to the most distal village is 47.2 km. In the outer, largely rural area (N3), this transect crosses two State Forests, and a large natural water reservoir (Hesaraghatta lake/ TG-Halli catchment) that has been earmarked for environmental conservation. The transect that cuts through transition landscapes (N2) well connected to the city (N1), agricultural lands become scarcer, built-up areas pre-dominate, wetlands and water bodies are characterized as ‘threatened’ by encroaching land development. Two major North-bound roads (NH7= Bellary Road and Doddballapura Road) merge at the Southern Edge. The edge of this area is defined as a ‘Mutation Corridor’, where permissible land use encompasses commercial, industrial, residential, and infrastructural areas. The selected areas thus cover the full range of ‘rural-urban transition stages’ envisaged for the Collaborative Research Centre’s fieldwork. The Gandhi Krishi Vigyan Kendra (GKVK) campus of the University of Agricultural Sciences, Bangalore, is also located in this transect.

The Southern transect (S) lies between two mutation corridors South of Bangalore city, the Mysore corridor and the IT corridor with Electronic City and Hosur Road. The distance from the most distal village is 40.1 km from the urban center (defined as

Vidhana Soudha). It is divided into three research areas, S1 (urban gradient), S2 (transitional gradient), and S3 (rural gradient). By 2004, about one-third of the open space (in S1 and S2) was still used for agriculture areas while the rest was vacant, with many new, legal, and illegal layouts. The local authorities’ conflicts over land acquisition to widen the Outer Ring Road attracted public attention in 2009. Further outward in S3, predominantly rural landscapes harbor two large protected natural habitats, the Bannerghatta National Park and the Vrishabhavathi Reservoir in this Southward region will likely continue to be exposed to tensions imposed by the competing corridors and the urban center, and is thus another focal area of transitions.



Selection of Agricultural households

Thirty-one villages in the North transect and 29 villages from the South transect were selected along with the rural-urban interface for the study. Three hundred agricultural households from the North and another 300 agricultural households from the South transect were selected for the project. Thus, the total sample constituted 600 agricultural households from 60 villages in the North and South transects. Eighty, 120, and 100 agricultural households from urban, transitional, and rural gradients were selected for the study in the North transect, while 85, 115, and 100 agricultural households from urban, transitional, and rural gradients were selected in the South transect of Bangalore. The number of villages and agricultural households selected for the study is presented in Table 1.

Table 1: Number of agriculture households and villages sampled in North and South transects

| Bangalore North Transect | | |
|-------------------------------|------------------------|-----------------|
| Gradients | Agriculture households | Villages/Cities |
| 1. Urban gradient (N1) | 80 | 05 |
| 2. Transitional gradient (N2) | 120 | 09 |
| 3. Rural gradient (N3) | 100 | 17 |
| Sub-Total | 300 | 31 |
| Bangalore South Transect | | |
| Gradients | Agriculture households | Villages/Cities |
| 1. Urban gradient (S1) | 85 | 07 |
| 2. Transitional gradient (S2) | 115 | 13 |
| 3. Rural gradient (S3) | 100 | 09 |
| Sub-Total | 300 | 29 |
| Grand Total | 600 | 60 |

Decision-making behavior (dependent variable) in the research study refers to the '*extent of involvement of farm men and women in deciding the agriculture and household activities that need to be performed*'. Decision-making was measured using the scale developed by Puri (1972) with slight modification. A total of 46 agriculture and household activities were included to know the decision-making pattern of farm men and women. While analyzing the decision-making pattern of farm men, the respondents were given a score of 1 for the decision taken by 'farm men alone' and 'farm women alone', whereas a score of 2 was given for the decision taken jointly by both farm men and women. The score for all the 46 agriculture and household activities were added, and later the farm men and women were grouped into poor, sound, and better decision making categories using mean and standard deviation as a measure of check;

| Decision-making category | Criteria |
|--------------------------|---|
| Poor | $< (\text{Mean} - \frac{1}{2} \text{SD})$ |
| Good | $(\text{Mean} \pm \frac{1}{2} \text{SD})$ |
| Better | $> (\text{Mean} + \frac{1}{2} \text{SD})$ |

Information regarding twelve profile characteristics of agricultural households (independent variables) was measured using suitable and standardized scales/ procedures. The ex-post facto research design was adopted in the present study.

Data collection and analysis

The data was collected from the 600 agricultural households thrice during 2017, 2018, and 2019 using the same schedule. Personal interviews and focused group discussion were carried out to collect relevant data from the head of the family and his spouse. The collected data were scored, tabulated, and analyzed using frequency, percentage, mean, standard deviation, zero-order correlation test, and student 't'-test.

RESULTS AND DISCUSSION

1. Spatial and temporal analysis of decision-making behavior of agricultural households along with the rural-urban interface of Bangalore

The results in Table 1 shows that 44.50 percent of the agricultural households in the rural gradient belonged to the better decision making category in respect of agricultural and household-related activities, while 34.50 and 21.00 percent of the agricultural households of the rural gradient belonged to poor and good decision-making category, respectively during 2017. Similarly, more agricultural households of the transitional gradient (46.81%) belonged to better decision-making, whereas 40.43 and 12.76 percent of the agricultural households of the transitional gradient belonged to good and poor decision-making categories, respectively. As high as 41.82 percent of the agricultural households of the urban gradient were also belonging to the better decision-making category. In comparison, 40.00 percent of the agricultural households of the urban gradient belonged to the excellent decision-making category, and the remaining 18.18 percent of the agricultural households of the urban gradient belong to the poor decision-making category about agricultural and household-related activities during 2017.

It is also observed from Table 1 that 45.00 percent of the agricultural households in the rural gradient belonged to the better decision making category in respect of agriculture and household-related activities during 2018, while 21.50 and 33.50 percent of the agricultural households in the rural gradient were belonging to good and poor decision-making category, respectively. Nearly half of the agricultural households of transitional gradient

Table 1: Spatial and temporal analysis of decision making behaviour of agricultural households in the rural urban interface of Bangalore

| | | Agricultural households | | | | | |
|---------|--------------------------|---------------------------------------|-------|--|-------|---------------------------------------|-------|
| Sl. No. | Decision-making category | Rural gradient (n ₁ =200) | | Transitional gradient (n ₂ =235) | | Urban gradient (n ₃ =165) | |
| | | No. | % | No. | % | No. | % |
| (A) | 2017 | | | | | | |
| 1 | Poor | 69 | 34.50 | 30 | 12.76 | 30 | 18.18 |
| 2 | Good | 42 | 21.00 | 95 | 40.43 | 66 | 40.00 |
| 3 | Better | 89 | 44.50 | 110 | 46.81 | 69 | 41.82 |
| (B) | 2018 | | | | | | |
| 1 | Poor | 67 | 33.50 | 29 | 12.34 | 28 | 16.96 |
| 2 | Good | 43 | 21.50 | 95 | 40.42 | 67 | 40.60 |
| 3 | Better | 90 | 45.00 | 111 | 47.24 | 70 | 42.44 |
| (C) | 2019 | | | | | | |
| 1 | Poor | 65 | 32.50 | 27 | 11.48 | 27 | 16.86 |
| 2 | Good | 44 | 22.00 | 96 | 40.85 | 68 | 41.21 |
| 3 | Better | 91 | 45.50 | 112 | 47.67 | 70 | 42.43 |

(47.24%) belonged to the better decision-making category. In contrast, 40.42 and 12.34 percent of the agricultural households of the transitional gradient belonged to the excellent, and poor decision-making category. Likewise, 42.44 percent of the agricultural households in the urban gradient belonged to the better decision-making category, while 40.60 and 16.96 percent of the agricultural households in the urban gradient belonged to the excellent and poor decision-making category concerning agricultural and household activities, respectively during 2018.

Table 1 also reveals that 45.50, 47.67, and 42.43 percent of the agricultural households of rural, transitional and urban gradients belonged to better decision-making categories in respect of agriculture and household activities respectively, during 2019. Whereas 22.00, 40.85, and 41.21 percent of the agricultural households of rural, transitional and urban gradients belonged to the good decision-making category regarding agriculture and household activities, respectively. Further, the results in Table 1 also show that 32.50, 11.48, and 16.86 percent of the agricultural households of rural, transitional and urban gradients belonged to the poor decision-making category concerning agriculture and household activities during 2019.

It is heartening to note that a vast majority of agricultural households along the rural-urban

interface belonged to the good to better decision-making category on agriculture and household activities during the years 2017, 2018, and 2019. Similar findings were reported by Bharat Kumar (2010), Nishitha (2017), and Nataraju *et al.* (2019).

2. Test of significance in respect of decision making of agricultural households along the rural-urban interface

A bird's eye view of Table 2 reveals that the mean decision-making score of agricultural households of rural gradient (71.15) was more than the mean decision-making score of agricultural households of transitional gradient (68.72). There existed a non-significant (t-value = 1.44) difference in the mean decision-making score of agricultural households between the rural and transitional gradients during 2017. Whereas the mean decision-making score of households of urban gradient (70.06) was also slightly higher than the mean decision-making score of households of transitional gradient (68.72), and there was a non-significant (t-value = 1.29) difference in the mean decision making score of agricultural households between the transitional and urban gradients. Similarly, the mean decision making score of agricultural households of rural gradient (71.15) was also more than the mean decision making score of agricultural households of urban gradient (70.06),

and the 't' value (0.99) exhibited a non-significant difference between the agricultural households of rural and urban gradients in respect of decision making mean score during 2017.

Table 2: Test of significance in respect of decision making behaviour of agricultural households in rural urban interface

| Sl. No. | Particulars | Decision-making behaviour | |
|---------|-------------------------------------|---------------------------|--------------------|
| | | Mean score | 't' value |
| (I) | 2017 | | |
| A | Rural gradient ($n_1=200$) | 71.15 | 1.44 ^{NS} |
| | Transitional gradient ($n_2=235$) | 68.72 | |
| B | Transitional gradient ($n_2=235$) | 68.72 | 1.29 ^{NS} |
| | Urban gradient ($n_3=165$) | 70.06 | |
| C | Rural gradient ($n_1=200$) | 71.15 | 0.99 ^{NS} |
| | Urban gradient ($n_3=165$) | 70.06 | |
| (II) | 2018 | | |
| A | Rural gradient ($n_1=200$) | 72.00 | 1.31 ^{NS} |
| | Transitional gradient ($n_2=235$) | 69.56 | |
| B | Transitional gradient ($n_2=235$) | 69.56 | 0.60 ^{NS} |
| | Urban gradient ($n_3=165$) | 71.02 | |
| C | Rural gradient ($n_1=200$) | 72.00 | 0.63 ^{NS} |
| | Urban gradient ($n_3=165$) | 71.02 | |
| (III) | 2019 | | |
| A | Rural gradient ($n_1=200$) | 72.51 | 1.11 ^{NS} |
| | Transitional gradient ($n_2=235$) | 70.61 | |
| B | Transitional gradient ($n_2=235$) | 70.61 | 1.23 ^{NS} |
| | Urban gradient ($n_3=165$) | 71.59 | |
| C | Rural gradient ($n_1=200$) | 72.51 | 0.78 ^{NS} |
| | Urban gradient ($n_3=165$) | 71.59 | |

NS=Non-significant.

The data in Table 2 also shows that the mean decision making score of agricultural households of rural gradient (72.00) was slightly more than the mean decision making score of agricultural households of transitional gradient (69.56) and the 't' value (1.31) revealed a non-significant difference in respect of mean decision score of agricultural households between rural and transitional gradients during 2018. While the mean decision making score of agricultural households of urban gradient (71.02) was more than the mean decision making score of agricultural households of transitional gradient (69.56) and the

't' value (0.60) revealed a non-significant difference in respect of the mean score of households between transitional and urban gradients. Likewise, the mean decision-making score of agricultural households in the rural gradient (72.00) was also slightly more than the mean decision-making score of agricultural households in the urban gradient (71.02). There was a non-significant (0.63) difference in respect of the mean decision-making score between rural and urban gradients during 2018.

The results in Table 2 reveal that the mean decision making score of agricultural households of rural gradient (72.51) was slightly higher than the mean decision making score of agricultural households of transitional gradient (70.61) and the 't' value (1.11) revealed a non-significant difference in respect of mean decision making score between rural and transitional gradients during 2019. While the mean decision making score of agricultural households of urban gradient (71.59) was also slightly more than the mean decision mean score of agricultural households of transitional gradient (70.61), and the 't' value (1.23) exhibited a non-significant difference concerning the mean decision making score of agricultural households between transitional and urban gradients. Similarly, the mean decision making score of agricultural households of rural gradient (72.51) was also slightly higher than the mean decision making score of agricultural households of urban gradient (71.59), and the 't' value (0.78) showed a non-significant difference in respect of mean decision making score of agricultural households between rural and urban gradients during 2019. It could be inferred from the study findings that there is a non-significant difference in the mean decision decision-making score of agricultural households between the rural, transitional and urban gradients over three years from 2017 to 2019.

A bird's eye view of Table 3 reveals that there is a marginal increase in the mean decision-making score of agricultural households in the rural, transitional and urban gradients over some time, but the statistical analysis revealed a non-significant difference in the mean decision making score of agricultural households between the years 2017 and 2018, 2018 and 2019 and 2017 and 2019.

Table 3: Temporal analysis of decision-making behaviour of agricultural households in the rural urban interface of Bangalore

| Sl. No | Agricultural households | Mean decision-making score | | | t value | | |
|--------|-------------------------------------|----------------------------|-------|-------|--------------------|--------------------|--------------------|
| | | 2017 | 2018 | 2019 | 2017 & 2018 | 2018 & 2019 | 2017 & 2019 |
| 1 | Rural gradient ($n_1=200$) | 71.15 | 72.00 | 72.51 | 0.12 ^{NS} | 0.10 ^{NS} | 0.29 ^{NS} |
| 2 | Transitional gradient ($n_2=235$) | 68.72 | 69.56 | 70.61 | 0.19 ^{NS} | 0.18 ^{NS} | 0.22 ^{NS} |
| 3 | Urban gradient ($n_3=165$) | 70.06 | 71.02 | 71.59 | 0.20 ^{NS} | 0.09 ^{NS} | 0.24 ^{NS} |

NS = Non significant.

3. Relationship of the profile characteristics of agricultural households of rural, transitional, and urban gradients with their decision-making behavior

A perusal of Table 4 reveals that age, family size, landholding, and social participation of agricultural households of rural, transitional and urban gradients had a positive and non-significant relationship with their decision-making behavior in agriculture and household activities.

Table 4: Relationship of profile characteristics of agricultural households of rural, transitional and urban gradients with their decision-making behaviour (n = 600)

| Sl. No. | Characteristics | Correlation value (r) |
|---------|--------------------------|-----------------------|
| 1 | Age | 0.083 ^{NS} |
| 2 | Education | 0.299 ^{**} |
| 3 | Family size | 0.091 ^{NS} |
| 4 | Occupation | 0.198 [*] |
| 5 | Farming experience | 0.222 [*] |
| 6 | Land holding | 0.090 ^{NS} |
| 7 | Employment | 0.413 ^{**} |
| 8 | Annual income | 0.442 ^{**} |
| 9 | Social participation | 0.055 ^{NS} |
| 10 | Innovative proneness | 0.334 ^{**} |
| 11 | Mass media participation | 0.204 [*] |
| 12 | Extension participation | 0.468 ^{**} |

NS=Non-significant; *Significant at 5% ** Significant at 1%.

In contrast, occupation, farming experience, and mass media participation of agricultural households of rural, transitional and urban gradients had a positive and significant relationship with their decision-making behavior at a five percent level. Variables such as education, employment, annual

income, innovative proneness, and extension participation of agricultural households of rural, transitional and urban gradients had a positive and highly significant relationship with their decision-making behavior at one percent level. Education, occupation, farming experience, employment opportunities, annual income, innovative proneness, mass media participation and extension participation have synergic effect on one another resulting in the development of good/better decision making on agricultural and household activities among the agricultural households of urban, transitional and rural gradients.

CONCLUSION

It is heartening to note a majority of the agricultural households of rural, transitional and urban gradients belonged to the good to better decision-making category in respect of agricultural and household activities. There was a non-significant difference in respect of mean decision-making scores and the rural rural-urban interface over three years from 2017 to 2019. There were a significant relationship between the decision-making behavior of agricultural households in rural, transitional and urban gradients with their mass media participation and extension participation. Dissemination of improved agricultural technologies through media (newspapers, farm magazines, radio, television, etc.) in local languages will increase the knowledge and thereby enhance the decision-making ability and involvement of agricultural households in agricultural and household activities. More exposure of agricultural households to the extension activities and frequent contact with the formal extension personnel will help the farmers gain knowledge for improving self-perception, self-esteem, and confidence to help them contribute to decision-making in agricultural and household activities.

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