

## Farm Land Values and Portfolio Management in Rural-urban Continuum of Bengaluru North

H. V. HARISHKUMAR AND B. V. CHINNAPPA REDDY

Department of Agricultural Economics, College of Agriculture, UAS, GKVK, Bengaluru-560 065

E-mail: harishpal0083@gmail.com

### ABSTRACT

The study analyses the impact of urbanization on farm land prices and portfolio management of sale proceeds in North Bengaluru. To capitalize on current high farmland prices augmented sales of farmland is observed in high urban influence areas. It is resulting in marginalization of farm holdings putting their livelihoods under risk in the long run. Forced sales are more pronounced in second gradient because of pressure from real estate business for villas and recreational infrastructure which requires more land. It is observed that about 32 per cent of land sale proceeds were used for construction of house which is a basic amenity and a symbol of social status as felt by the respondents in the area. About 16 per cent of proceeds were used for wasteful consumption purposes like performing marriages, gambling and others. In third gradient, the number of farmers selling land and extent of sales are increasing over the period (2002-16) indicating the influence of urbanization in the form of slow rise in the value of the farmland which may have potential threat on farmlands and livelihood of farmers.

Keywords: Farm land value, urbanization, transformation, portfolio management, livelihood

BENGALURU is one of the fastest growing cities in the world and is globally known for its development in terms of information technology, biotechnology, real estate and its diversity. Bengaluru topped the list of 134 world's most dynamic cities, which considered 42 variables including recent and projected changes in city GDP, population, commercial real estate constructions, rents and other factors *viz.*, education, innovation and environment (Anon., 2017). These developments have led to transition in land use, land values, labour markets, water resources, lifestyles and livelihood options. Similar rapid surge in urban expansion can be observed across the country. For instance, as a result of urban expansion, land use/land cover has changed drastically at the periphery of the Jalandhar city and it has led to the transformation of the rural landscape into the urban landscape where inbuilt up area has increased to 37 per cent (2010) from 8 per cent (1975) at the cost of reduction in farm land from 52 per cent to 31 per cent (Seema, 2014). The developments like establishment of International airport, National highways, Hardware Park, Financial city project and other industries in the Bengaluru north has triggered the process of transformation of farm lands by surging prices and this has increased

marginalization of farm holdings in high urban influence areas. Larry and Burton (2012) reported that 37 per cent of respondents sold farmland to capitalize on current high land prices and resulting capital gains and reported that the farm land values had doubled in just five years and increased five folds during a period of 11 years in South Dakota, USA.

These developments attracted the investment by real estate sector and the agricultural lands turned as common floor for Flats, Villas, Cargos and Godowns, Schools and Colleges, Hospitals, Malls and Supermarkets, Resorts, Hotels and Restaurants', Courier operators, Parking yards, Advertisement boards etc. Xiaowei and Jay (2013) expressed that urban influencing factors were playing a critical role in affecting the overall farmland value and high real estate earnings had led to rising farmland prices.

In the above context the study aims at analysing the marginalization of farm holdings, escalation in the farm land values over the period, kind and nature of farmland sales in different periods and their extent, reasons behind the sale of farmlands and portfolio

management of sale proceeds in the rural-urban continuum of Bengaluru North. The irreversible transformation of farm lands has created a concern about sustainability of agriculture surrounding the Bengaluru city. Kavitha *et al.* (2015) expressed their concern to protect and conserve the farmlands by proper policy and guidelines, as over the years, expansion of Bengaluru to the fringes has declined the magnitude of agricultural land by 16.31 per cent. Similar concerns were also expressed by Li jiang *et al.* (2013), who alerted that the urban expansion is likely to continue and would result in reduction in the production in China due to reduced agricultural land use intensity. Santhakumar (2014) suggested for any development, the land value and its influencing factors have to be verified for preparation of plans, projects and policies to achieve a comprehensive solution.

#### METHODOLOGY

Agriculture has seen transitions in terms of land use system, land values, water, labour, marketing system in rural-urban interface of Bengaluru North, because of developments in the area. Hence the study was conducted in the rural-urban continuum of Bengaluru North to analyze the influence by urbanization process on farm land values.

A multistage random sampling procedure was employed for the selection of study area and sample respondents. At first level Bengaluru Urban (Urban), Bengaluru Rural (Peri-Urban) and Chikkaballapur (Rural) districts were selected and in next level Bengaluru North, Devanahalli and Gudibande taluks were selected and in each taluk four villages were selected at random. In the next and last level, 15 sample farmers were randomly selected from each village thus forming a total sample size of 180 with equal spread of 60 from each gradient. The sample farmers were interviewed using a pre-tested schedule and data on socio-economic characters, land holdings, farm land values at five years' interval since 2001, land sale details and portfolio management of its proceeds was collected. Analytical measures like descriptive measures and percentage changes were used in analyzing the rise in farmland values, number and extent of land sales and its portfolio management.

#### Garret ranking technique

To analyze the reasons for the sale of farmland in the study area, a list of reasons for sale of farm lands was developed during the preliminary survey conducted in the study area and the sample farmers were asked to rank the reasons at the time of interview using a pretested schedule. The garret ranking technique was employed to prioritize the ranks given by the sample farmers. The order of the rank given in ascending order was converted to per cent position using the formula.

$$\text{Per cent position} = \frac{100*(R_{ij}-0.50)}{N_j}$$

Where  $R_{ij}$  = Rank given for  $i^{\text{th}}$  reason by  $j^{\text{th}}$  respondent

$N_j$  = Number of items ranked by  $j^{\text{th}}$  respondent

The per cent position of each rank was converted into scores by referring to the table given by Garret and Woodworth (1969). Then for each reason, the scores of individual respondents were summed up and divided by the total number of respondents from whom scores were gathered. The mean scores for all the factors were ranked, following the decision criterion that higher valued reason will secure the first rank and so on.

#### RESULTS AND DISCUSSION

As the influence of urbanization increases the marginalization of farm lands is more pronounced and this phenomenon can be observed in Table I. In the first gradient, where urban influence is highly conspicuous, 6.66 per cent of the sample respondents were landless. But they were still cultivating the land by leasing in the land from other farmers. These respondents had completely sold their land before the year 2000 and no assets were generated out of sale proceeds because of conspicuous consumption. Majority of the respondents were marginal farmers with an average land holding of 0.36 hectares. In the second gradient, where urban influence is comparatively lower, majority of respondents belonged to small (46.66 %) and marginal farmer group (41.66 %) with an average holding size of 1.66 and 0.42 hectares. In the third gradient where urban influence is very low, majority of respondents were classified under medium farmers with an average land holding size of 2.46

TABLE I  
*Classification of sample farmers based on size of land holdings across gradients*

Farmer category	Gradient - I (Urban) (n=60)		Gradient - II (Peri-Urban) (n=60)		Gradient - III (Rural) (n=60)	
	Average land size (ha)		Average land size (ha)		Average land size (ha)	
Sample size	No.	%	No.	%	No.	%
Landless farmers	4	0 (6.66)	0	0	0	0 (0.00)
Marginal farmers (< 1 ha)	34 (56.66)	0.36	25 (41.66)	0.42	4 (6.66)	0.49
Small farmer (1-2 ha)	13 (21.66)	1.37	28 (46.66)	1.66	19 (31.66)	1.34
Medium farmer (2-5 ha)	7 (11.66)	2.31	7 (11.66)	2.37	37 (61.66)	2.46
Large farmer (> 5 ha)	2 (3.333)	6.07	0 (0.00)	0.00	0 (0.00)	0.00
Average farm size (ha)		0.97 *		1.22 *		1.97 *
t-stat		6.20		12.29		19.79

Note: \* Significant at 1 per cent level of significance; Figures in parentheses represent percentages to total

hectares. Ramalinge Gowda *et al.* (2012) reported similar results in Magadi taluk of Bengaluru district, where in long-term, the rise in land prices was associated with reduced farm holding size. As the influence of urbanization decreases, the average holding size of farm increases and these changes were statistically significant at one per cent level.

In any land sales there exists two prices, one is registered price indicating the fundamental value fixed by the state government and other is sale price or market price i.e. the actual price at which the land is transacted. The actual sale price is the true reflector of land values. These values were obtained from farmers through their memory recall by asking them the actual sale price of nearby similar lands which were transacted in that year and is elicited in the Table II.

In first gradient, the farm land values have tripled every five years since 2001 and between 2006 to 2011 the highest percentage increase was observed and it is attributed to the establishment of international airport in 2008 and road development like signal-free corridor on a stretch of elevated expressway and up gradation of NH7 to six lanes from Hebbal to Devanahalli airport. The average land value of farm size of 0.97 ha was Rs.5.652 crores at the end of 2016.

In the second gradient, the farm land values during 2002-06 and 2007-12 increased four times mainly due to establishment of international airport in the area and in the latest period (2012-16) land values have not increased to the earlier extent. The land values have seen highest increase in 2001-2006, because of anticipation of future developments in the area. The average land value of farm size of 1.22 ha was Rs. 2.522 crores at the end of 2016. In third gradient, the land values were relatively lower than the first two gradients because of low urban influence. Here also the percentage increase in land values was highest during the period 2006-11. The average land value of farm size of 1.97 ha was 0.662 crores at the end of 2016. Larry and Burton (2012) reported similar results that the farm land values had doubled in just five years and increased five folds in 11 years in South Dakota, USA.

As the urban influences increases, the number of farmers selling farm land increases as presented in Table III. In the first gradient, majority (65 Per cent) of respondents sold their lands in different periods and the average size of farm land sale was 0.496 hectares. Of the total farmers sold the land, 10.26 per cent had completely sold their farm land and are now cultivating the land by leasing in and for the rest partial sales

TABLE II  
*Land values in different periods and across different gradients*

Year	Gradient - I (Urban)		Gradient - II (Peri Urban)		Gradient - III (Rural)	
	Value (Rs. Lakhs/ ha)	Percentage increase	Value (Rs. Lakhs/ ha)	Percentage increase	Value (Rs. Lakhs/ ha)	Percentage increase
2001	14.33	-	1.98	-	0.64	-
2006	46.19	222.41	26.68	1250.00	3.24	403.85
2011	195.38	322.99	112.88	323.15	22.97	609.92
2016	582.67	198.23	206.74	83.15	33.59	46.24
Average land holding size (ha)		0.97		1.22		1.97
Average land value per farm (Rs in lakhs)		565.20		252.20		66.2.

were reported. Around eight per cent of total farmers who sold land due to force of the real estate business firms and the rest voluntarily sold their lands. In the gradient two, 45 per cent of sample respondents sold their farm land and the average size of sale was 0.552 hectares and all were partial sales. Of the total farmers sold the land 18.52 per cent of farmers reported the forced sales and it is mainly due to pressure from real estate business where in the lands were purchased for construction of villas and recreational infrastructure

which requires more land than apartment constructions.

In the gradient three, 23.33 Per cent of sample respondents sold the lands and the average size of sale reported was 0.477 hectare. In gradient three no complete and forced sale were reported as the pressure on land is comparatively lower when compared to the other two gradients. No much difference was observed across the gradients with regard to size of land sold.

TABLE III  
*Number of farmers sold the farmland and kind and nature of sale across the gradients*

Particulars Sample Size	Gradient - I (Urban)	Gradient - II (Peri Urban)	Gradient - III (Rural)
	n = 60	n = 60	n = 60
Number of farmers who sold land (No.)	39 {65.00}	27 {45.00}	14 {23.33}
Average land sale (ha)	0.50	0.55	0.48
Type of sale	4	0	0
Complete sale (No.)	(10.26)	(0.00)	(0.00)
Partial sale (No.)	35 (89.74)	27 (100.00)	14 (100.00)
Nature of sale	36	22	14
Voluntary sale (No.)	(92.30)	(81.48)	(100.00)
Forced sale (No.)	3 (07.70)	5 (18.52)	0 (0.00)

Note : {} - Figures in the parenthesis are the percentage of sample size,

() - Figures in the parenthesis are the percentage to the total number of farmers sold the farm land

But Ramalinge Gowda *et al.* (2012) reported contrasting results that the average size of land sold in farms with high urban influence areas (0.56 acres) was less than that of farms with low urban influence (6.5 acres).

The sale of farm land at five-year interval is presented in Table IV in order to attribute factors responsible for sale and value of the sale. In gradient one during 2012-16, majority (30.76 Per cent) of farmers sold the land but the extent of sale was more (34.49 Per cent) during 2002-06 and it is attributed to perking up of urbanization process and anticipated developments like international airport. Because of high per hectare land price and quite high transaction of land, the total value of sale was highest in the latest period. In total 19.363 hectares of land worth Rs.2702.13 lakhs was sold by 39 respondents for non-agricultural uses.

In the second gradient, the number of farmers sold the land as well extent of land transacted and value of transaction was high during 2007-11 and this is mainly attributed to the operation of international airport during May, 2008 in the region. In total 14.921 hectare of land worth Rs.1375.64 lakhs was sold by

27 sample respondents for non-agricultural uses in this gradient.

In third gradient no sales were reported before 2001 among sample respondents and it is interesting to note that number of farmers selling the land and extent of sale were increasing over the period indicating the influence of urbanization in the form of slow rise in the value of the farmland. In total 6.68 hectares' worth of Rs.158.467 lakhs was transacted by 14 sample respondents for agricultural uses. Santhakumar (2014) also reported that urban pressures, future development potential of the area, location, land scarcity, availability of infrastructure and land use change have a great influence for the variation in land value.

The sale proceeds of farm land were used by the sample respondents for different purposes which include conspicuous and wasteful consumption as well meaningful investment in the form of asset generation and are considered as different portfolios which are presented in Table V. It could be observed that majority of the proceeds flowed to construction of house across the gradient, since house is a basic amenity. Besides it is status symbol to have a good house. Hence higher

TABLE IV  
*Sale of farm land at different periods across gradients*

Period	Gradient - I (Urban)			Gradient - II (Peri Urban)			Gradient - III (Rural)		
	Number	Extent	Value	Number	Extent	Value	Number	Extent	Value
Before 2001	9 (23.07)	5.86 (30.26)	69.52 (2.57)	3 (11.11)	0.91 (6.10)	1.18 (0.08)	0 (0.00)	0.00 (0.00)	0 (0.00)
2002-2006	11 (28.20)	6.68 (7.70)	208.21 (34.49)	7 (25.92)	3.30 (22.12)	71.05 (5.16)	2 (14.28)	0.86 (12.87)	2.49 (1.57)
2007-2011	7 (17.94)	1.74 (8.96)	205.31 (7.597)	12 (44.44)	7.47 (50.06)	723.66 (52.60)	5 (35.71)	1.52 (22.72)	29.08 (18.34)
2012-2016	12 (30.76)	5.09 (26.27)	2219.09 (82.12)	5 (18.51)	3.24 (21.70)	579.76 (42.14)	7 (50.00)	4.30 (64.39)	126.90 (80.07)
Totall stat	39	19.36* 10.12	2702.13* 6.62	27	14.92* 7.01	1375.64* 5.28	14	6.68* 4.65	158.47* 5.57

Note: () - Figures in the parenthesis are the percentage to the total

\* Significant at 1 per cent level of significance

investment on housing is observed. The next important purpose was sharing of land sale proceeds among girl children. This was commonly seen in the first two gradients in order to avoid legal problems in future. Conspicuous and wasteful consumption was also one of the major expenses in the portfolio of the first two

gradients. This includes gambling, going for family trips, enjoying luxurious lifestyles for short period *etc.* and it was most pronounced in first gradient. Use of land proceeds for marriages and other ceremonies was also one of the components of portfolios in the first two gradients where it has formed a major component in

TABLE V  
*Portfolio management of land sale proceeds across the gradients (Rs. in Lakhs)*

Portfolios	Gradient - I (Urban)	Gradient - II (Peri Urban)	Gradient - III (Rural)
Asset based portfolios			
Construction of house	22.64 (32.67)	14.92 (29.28)	3.96 (35.04)
Bank savings	4.41 (6.36)	2.03 (3.98)	0 (0.00)
Purchase of liquid assets like gold	3.16 (4.56)	3.38 (6.63)	0.33 (2.91)
Purchase of Household materials like sofas, dining table, computer etc...	2.96 (4.28)	1.32 (2.59)	0.10 (0.88)
Investment in Agriculture in the form of agriculture machinery	2.65 (3.82)	1.26 (2.47)	1.06 (9.40)
Investment in Agriculture in the form irrigation structure i.e. bore well	2.37 (3.42)	1.40 (2.75)	1.35 (11.99)
Invested in non-farm business	2.10 (3.03)	0 (0.00)	0 (0.00)
Purchase of vehicles	2.03 (2.93)	1.7 (3.33)	0.35 (3.09)
Investment in Agriculture in the form of orchard establishment	1.17 (1.68)	0.79 (1.55)	0.86 (7.60)
Purchase of plot or site or flat	0.95 (1.37)	2.25 (4.41)	0 (0.00)
Purchase of agricultural land	0.55 (0.79)	0 (0.00)	0 (0.00)
Non-asset based portfolios			
Shared among girl children's	6.63 (9.56)	2.51 (4.92)	0 (0.00)
Conspicuous and wasteful consumption	5.14 (7.41)	3.41 (6.69)	0.10 (0.88)
Performed marriage and other ceremonies	4.45 (6.42)	6.78 (13.30)	1.35 (11.99)
Children's education	3.93 (5.67)	2.67 (5.25)	0.59 (5.21)
Towards servicing old debts	3.78 (5.46)	6.06 (11.90)	1.24 (10.96)
Hospital expenses	0.32 (0.47)	0.45 (0.88)	0 (0.00)
Total	69.24	50.93	11.29

Note: ( ) - Figures in the parenthesis are the percentage to the total

the portfolio next to construction of house in second gradient. A considerable proportion of sale proceeds have been maintained in the form of bank savings in the first two gradients.

Clearing old debts from the sale proceeds of farm land was common across all gradients and is received top priority in the second gradient. In third gradient, 28.99 Per cent of proceeds were invested in agriculture, this form less than nine per cent of total proceeds in the first two gradients, indicating the use of proceeds for non-agricultural activities. However, the habit of bank savings out of sale proceeds was not observed in the third gradient. In general asset based portfolio share is high in third gradient (70.91 Per cent) compared to first (64.91 Per cent) and second (56.99) gradients.

Using the garret ranking technique, the reasons behind the sale of farmlands were elicited in the study

area and results are presented in the Table VI. Construction of house and performance of marriages were identified as major reasons for sale of land across all the gradients. Forced sale and remoteness of land parcel were the factors that least influenced the sale. But Larry and Burton (2012) reported contradictory reasons like high land prices and debt servicing as reasons for selling farmland in South Dakota, USA.

Urbanization process has created the marginalization of farm lands and it will have long run impact on food production in the study area. Rural gradient, where urban influences is low now showing tendency of increase in number as well extent of sales because of slow rise in prices and in future it may create problems of marginalization and conversion of farm land for non-agricultural uses. Next to housing majority of land sale proceeds were used for wasteful and conspicuous consumption, hence awareness on

TABLE VI  
*Reasons for sale of farmland across the different gradients*

Reasons	Gradient - I (Urban)			Gradient - II (Peri Urban)			Gradient - III (Rural)		
	Total score	Avg. score	Rank	Total score	Avg. score	Rank	Total score	Avg. score	Rank
House construction	3833	79.85	I	3650	77.66	I	1561	70.95	I
To carry out ceremonies	3009	62.69	II	3470	73.83	II	1483	67.41	II
To purchase site	2160	45.00	VII	2216	47.15	VII	1177	53.50	VI
To purchase Agricultural land at remote areas	1939	40.40	VIII	1815	38.62	VIII	1320	60.00	III
To purchase assets like vehicles, gold etc...	2641	55.02	V	2728	58.04	III	1178	53.55	V
For children's education	2720	56.67	IV	2472	52.60	V	1141	51.86	VII
To clear old debts	2769	57.69	III	2504	53.28	IV	1226	55.73	IV
Remoteness of parcel	1434	29.88	IX	1107	23.55	X	729	33.14	VIII
Forced sale	1242	25.88	X	1238	26.34	IX	564	25.64	X
Luring prices	2205	45.94	VI	2253	47.94	VI	599	27.23	IX

portfolio management need to be created so that the farmers income can be sustained in the long run by way of investing in capital assets. Presently the transacted land in first two gradients is used for non-agricultural purposes and in future there are chances of resurgence of same problem in rural gradient too. Hence, proper policies should be evolved for protection of agricultural lands in the study area, so that the livelihood of large number of farmers can be safeguarded in the long run.

#### REFERENCES

- ANONYMOUS, 2017, City momentum index. Jones Lang LaSalle, Chicago, p. 9 - 12.
- GARRETT, H. E. AND WOODWORTH, R. S., 1969, *Statistics in Psychology and Education*. Vakils, Feffer and Simons Pvt. Ltd., Bombay, p. 329.
- KAVITHA, A., SOMASHEKAR, R. K. AND NAGARAJA, B. C., 2015, Urban expansion and loss of Agriculture land - A case of Bengaluru city. *Int. J. Geomatics Geosci.*, **5**(3) : 492 - 498.
- LARRY JANSSEN AND BURTON PFLUEGER, 2012, South Dakota agricultural land market trends 1991 - 2012. *South Dakota State University*, South Dakota, p.1-28.
- LI JIANG, XIANGZHENG DENG AND KAREN C. SETO, 2013, The impact of urban expansion on agricultural land use intensity in china. *Land use pol.*, **35** : 33 - 39.
- RAMALINGE GOWDA, U. C., CHANDRAKANTH, M. G., SRIKANTHAMURTHY, P. S., YADAV, C. G., NAGARAJ, N. AND CHANNAVEER, 2012, Economics of peri-urban agriculture-case of Magadi off Bangalore. *Econ. Pol. Weekly*, **47**(24) : 75 - 80.
- SANTHAKUMAR SWAMIDURAI, 2014, Factors affecting urban land value in Indian cities - Chennai city as a case study. *Int. J. Res. Scientific Innovation*, **1**(3) : 31 - 34.
- SEEMA RANI, 2014, Monitoring land use/land cover response to urban growth of the city of Jalandhar using remote sensing data. *Int. J. Adv. Res.*, **2**(6) : 1122 - 1129.
- XIAOWEI CAI AND JAY E NOEL, 2013, California Farmland Valuation : A Hedonic Approach. Poster presented In : *Agric. Appl. Econ. Assoc. Joint Annual Meeting*, Washington, DC. August 4 - 6.

(Received : May, 2017 Accepted : June, 2017)