Extension Journal

International Journal of Agriculture Extension and Social Development

Farmers perspectives on farmland sales: Navigating sentiments across the rural-urban continuum of Eastern dry zone of Karnataka

KA Shobha and PS Srikantha Murthy

Department of Agricultural Economics, College of Agriculture, UAS, GKVK, Bengaluru, Karnataka, India

DOI: https://doi.org/10.33545/26180723.2024.v7.i12i.1483

Corresponding Author: KA Shobha

Abstract
As rural communities increasingly face pressures from urban expansion, industrialization, financial necessity, socio-economic obligations and shifting agricultural policies, the sale of farmland becomes a contentious and multifaceted issue. On this context, the present was carried out to explores the dynamics of farmland sales, management of proceeds from such transactions and emotional responses of farmers after sale of farmlands across rural-urban continuum. The research found that the land values in BTHL increased from ₹0.23 to ₹12.57 lakhs/acre from 2000 to 2020, with a CAGR of 22.14 percent primarily driven by infrastructure developments like establishment of MNCs, road connectivity projects, railway connectivity, airport connectivity and many other corporate development projects. Wherein CTUP witnessed an even steeper rise, from ₹2.05 to ₹63.91 lakhs/acre (CAGR 18.76%), fuelled by its strategic proximity to urban centres and critical infrastructure projects/facilities. Further, farmland transactions in 2019 &2020 revealed significant contrasts: BTHL averaged transactional value is ₹12.57 lakhs/acre across 88.96 acres, while in CTUP ₹63.91 lakhs/acre for 42.17 acres. Furthermore, portfolio analysis of land sale proceeds showed differing socio-economic priorities. In BTHL, 80.59 percent was allocated to asset-based investments, with a focus on debt repayment (29.44%) and agriculture (21.71%). While in CTUP, 72.56 percent is marked for asset-based investments like housing and real estate. In case of non-asset spending, BTHL emphasised more on social ceremonies and education, while CTUP showed higher allocations for conspicuous consumption and bequeathing to girl children. Whereas, sentiment analysis uncovered predominantly negative perceptions in both regions, reflecting concerns over lost livelihoods and uncertain futures. Negative sentiments were higher in CTUP (43.47%) than in BTHL (37.5%), likely due to the rapid urbanization and forced land sales. However, a minority expressed positive sentiments, citing opportunities for reinvestment and financial stability. These findings underscore the socio-economic and emotional complexity of farmland sales, driven by urbanization and market dynamics. The findings of the study highlight the need for balanced policies to address the challenges of land use transitions while supporting farmers' aspirations and livelihoods.

Keywords: Land values, farmland sales, portfolio management, sentiment analysis, Eastern dry zone

Introduction
Urbanization is a global phenomenon characterized by human settlements and associated anthropogenic activities, significantly influencing land use and land cover changes. One of the most noticeable impacts of urbanization is urban sprawl, which has a profound effect on farmland values. High real estate returns have driven a surge in farmland prices, prompting farmers to sell their land to capitalize on the current market trends and realize substantial capital gains. These developments have brought about a transition in land use systems, farmland values, agricultural production systems, farm capital accumulation, and diversification of income sources. A similar trend of rapid urban expansion can be observed across India. For example, in Jalandhar city, urban growth led to a dramatic transformation of the rural landscape into urban areas, with the built-up area increasing from 8 percent in 1975 to 37 percent in 2010, while farmland decreased from 52 percent to 31 percent (Seema, 2014) [12].
In rural India, despite higher crop prices, farmers face declining profitability due to rising costs of cultivation, particularly labour costs. Mechanization is often unaffordable for small and marginal farmers, leaving them at a disadvantage. The poor returns from farming, coupled with non-price risks and social obligations, often compel farmers to sell their land. Many farmers reinvest part of the proceeds in cheaper land elsewhere, reflecting the growing demand from investors for rural land. Wealthy households and urban elites have increasingly purchased rural land as an investment since the early 2000s (Chakravorty, 2013; Rajshekar, 2013) [1, 8]. Fairbairn (2014) [2] emphasized the role of high-net-worth individuals in acquiring rural land but noted the lack of analysis on the implications of such processes. This trend, fuelled by growing income inequality, has contributed to rural dispossession and a shift in land ownership patterns.
Chikkaballapur, located 45 km from Bengaluru North, represents a prime example of urban periphery dynamics. Developments such as the establishment of an international airport, national highways, a hardware park, a financial city project, and other industries in Bengaluru North have significantly driven up land prices and intensified farmland

fragmentation. Similar trends have been observed globally. For instance, Larry and Burton (2012) reported that 37 percent of respondents in South Dakota sold farmland to benefit from soaring prices, with farmland values doubling in five years and increasing fivefold in 11 years. The rise in land values has attracted significant investment from the real estate sector, leading to the transformation of agricultural land into sites for constructing flats, villas, warehouses, schools, malls, resorts, and other urban infrastructure. Xiaowei and Jay (2013) [14] also highlighted the critical role of urban influences in driving up farmland values, with high real estate earnings fuelling this trend in California.

The present study aims to analyse the dynamics of farmland sales, escalation of farmland values, portfolio management of farmland sale proceeds and sentiments analysis of farmers after farmland sale in the study area. The irreversible transformation of farmlands raises significant concerns about the sustainability of agriculture. Vijayabaskar and Menon (2016) [13] argued that small-scale land sales have emerged as a critical means of dispossessing marginal and small farmers, driven by state neglect of agricultural infrastructure, particularly irrigation. Land markets have thus contributed to land fragmentation rather than consolidation. Kavitha et al. (2015) [4] emphasized the need for policies and guidelines to protect and conserve farmland, highlighting how Bengaluru's expansion has reduced agricultural land by 16.31 percent. Similarly, Li Jiang et al. (2013) [6] warned that continued urban expansion in China could diminish agricultural productivity due to reduced land use intensity. Santhakumar (2014) [11] suggested that land values and influencing factors must be carefully considered when planning development activities to ensure sustainable solutions and balanced development.

Methodology
Agriculture in the eastern dry zone of Karnataka has undergone significant transitions in land use systems, land values, water availability, labour dynamics, and marketing practices, primarily driven by developments in the region. To examine the impact of urbanization and other key factors on farmland values, a study was conducted within the rural-urban continuum of Chikkaballapur district.

A multistage random sampling method was employed to select the study area. At the initial stage, Chikkaballapur district was chosen. Subsequently, CTUP (Chikkaballapur Taluk Urban Periphery) and BTHL (Bagepalli Taluk Hinterlands) were selected as the focus areas. In the next stage, lists of farmers who sold farmland in 2019 and 2020 were obtained from the respective taluk Sub-Registrar's Offices under the Stamps & Registration Department. From these lists, purposeful sampling was used to select 40 respondents each from Chikkaballapur taluk and Bagepalli taluk, culminating in a total sample size of 80 farmers. Data collection in Bagepalli taluk covered 22 villages across four hoblies, while in Chikkaballapur taluk, data were gathered from 25 villages spanning three hoblies.

The selected farmers were interviewed using a pre-tested questionnaire, collecting comprehensive data on their socio-economic characteristics, landholdings, farmland values, reasons for land sales, and specific land sale details. Descriptive statistical tools and percentage change analysis were employed to evaluate the rise in farmland values and examine the trends in the number and extent of land sales.

Percent variation was calculated in reference to base year (beginning year)

Percent variation = [(Current year value - Base year value)/ Base year value] * 100

Compound Annual Growth Rate (CAGR)
To assess the growth rate in land values over the reference period the following growth rate formula was used.

$$CAGR = \left(\frac{Vfinal}{Vbegin}\right)^{1/t} - 1$$

Where,
CAGR= Compound annual growth rate
V_{begin}=Beginning value
V_{final}=Final value
t = Time in years

Sentiment Analysis
To evaluate the positive and negative emotions of farmers following land sales, sentiment analysis was conducted. A group discussion was organized to gather farmers' opinions, and the insights from the discussion were transcribed into text data for analysis.

Preprocessing text
This step is required for text analysis to transform human language into a machine-readable format for subsequent processing and analysis. There are some mandatory steps to request clean-up, which are listed below.
- Convert all the text to lower case
- Removing stop words, sparse terms, and particular words
- Convert numbers into words or remove the numbers
- Removing white spaces (leading and ending spaces)
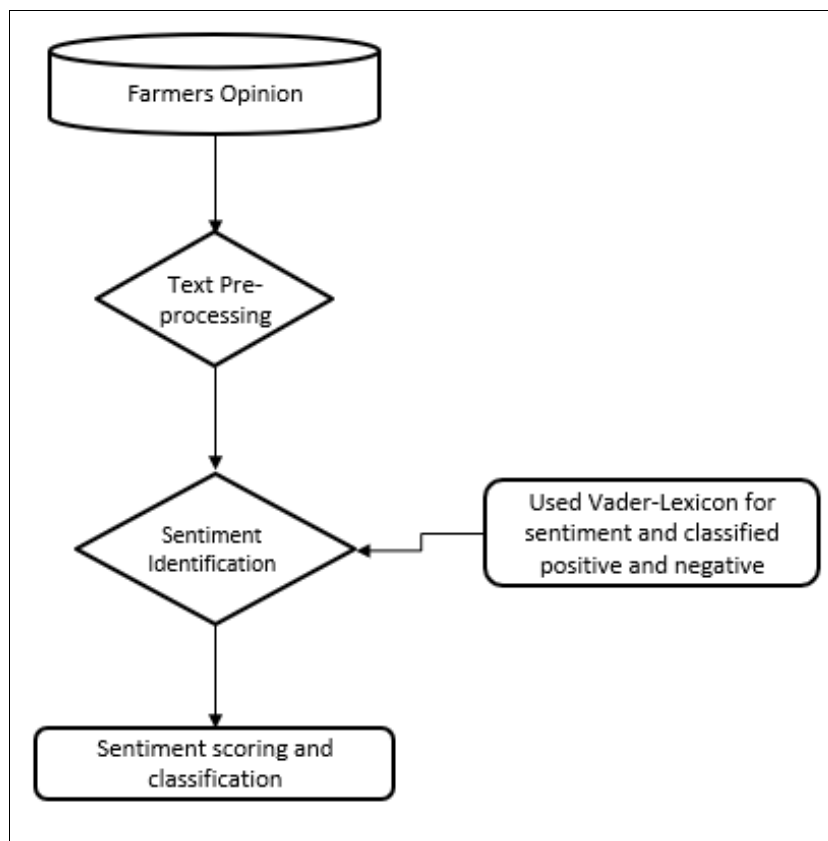- Removing punctuation (all types of special characters or symbols).

Fig 1: Process flow for sentiment analysis

First, we have started to eliminate duplication of rows, and it is essential to delete duplicate data or rows to avoid unbiased results. Convert all text to lowercase to prevent more than one copy of the same word.

- Eliminate keywords that often appear in the text or we create a list of keywords, or we use predefined libraries. We used stopword and text, blob libraries that will deal with stopwords. For stewards, we have deleted common words in the general scenario, but we can also delete naturally occurring comments from our textual data. We can therefore check the ten words that occur frequently, and then decide which to delete.
- Tokenization is the process of dividing text into a series of words or phrases. In our example, we used the text blob library to transform our tweets into a blob and convert them into a group of words.
- Stemming refers to the removal of suffices, like "ing," "ly," "s," etc., through a straightforward rules-based approach. For that we used PorterStemmer of the NLTK library. Lemmatization is a more suitable method than stemming because it converts the term in its root term, rather than just stripping it enough. it uses vocabulary and proceeds to a morphological analysis to obtain the root word. hence, we generally prefer to use lemmatization instead of stamping. We've done all the basic preprocessing steps to clear the text, and now we need to extract the characteristics using natural language techniques.
- N-grams are defined as a combination of several words used in combination. N-grams, bigrams and trigrams were used. Unigrams will not have a great deal of information compared to bigrams and trigrams. We use these bigrams or trigrams to grasp the structure of the language, such as which letter or word is likely to follow that given. Those recommendations are going to depend on the implementation of our study. Sometimes, if we use low grams and do not grasp the essential differences or if we sometimes take long grams, it will not capture the overall sense of the expression.
- Part-of-speech tagging (POS): The marking of a part of the speech assigns mostly speeches to each word of the text according to its context and its definition (nouns, verbs, adjectives and others).

Results and Discussion

In any land sale, we observe two prices, one is the registered price indicating the fundamental value fixed by the state government and the other is the 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 presented in Table 1.

In BTHL, land values experienced a significant increase, rising from ₹0.23 lakhs per acre in 2000 to ₹12.57 lakhs per acre in 2020. The most notable surge occurred between 2005 and 2010, during which land prices more than tripled. This sharp rise is attributed to major infrastructural developments, including the establishment of the international airport in Devanahalli in 2008 and improvements to NH-7. Interestingly, individuals who sold their land in the Devanahalli region for the airport development were among those purchasing agricultural land

in rural areas, further contributing to the increase in rural land demand.

In CTUP, the escalation in land values was even more dramatic, with average prices rising from ₹2.05 lakhs per acre in 2000 to ₹63.91 lakhs per acre in 2020. Similar to BTHL, the highest growth occurred between 2005 and 2010, when prices more than tripled. This surge can be attributed to several key factors: (a) the creation of Chikkaballapur district in 2007, which involved reorganizing taluks from the former Kolar district; (b) the district's proximity, just 25 km away from the Devanahalli international airport; (c) the construction of critical infrastructure, including the six-lane north-south NH-7 and east-west NH-69 highways; and (d) anticipated future developments in the region. Supporting this trend, Larry and Burton (2012) documented similar findings, noting that farmland values in South Dakota, USA, doubled within five years and quintupled over 11 years.

Table 1: Land values in different periods across BTHL and CTUP

Sl. No.	Year	Rural		Urban	
		Value (Rs. Lakhs/ac)	Percentage Increase	Value (Rs. Lakhs/ac)	Percentage Increase
1	2000	0.23		2.05	
2	2005	0.55	139.13	4.82	135.12
3	2010	2.60	372.72	20.05	315.97
4	2015	5.25	101.92	34.50	72.06
5	2020	12.57	139.42	63.91	85.24
Average land holding size(ac)		6.65		4.15	
Average land value per farm (₹ in lakhs)		83.59		265.22	
Average land value per ac (₹ in lakhs)		12.57		63.91	
CAGR (%)		22.14		18.76	

Table 2: Sale of farm land in 2019 and 2020 across study area

Sl. No.	Period	BTHL			CTUP		
		Number	Extent (ac)	Value (Rs. Lakhs)	Number	Extent (ac)	Value (Rs. Lakhs)
1	2019	25	67.16	580	27	27.72	1206
2	2020	15	21.80	303.9	13	14.45	910
Total		40	88.96	883.90	40	42.17	2116
Average			2.22	12.57		1.05	63.91

The average size of farmland sold, and value of farm land sale is presented in Table 2. The farmland sales in BTHL and CTUP during 2019 and 2020 reveal significant differences in transaction patterns, land size, and value. In BTHL, a total of 40 transactions covered 88.96 acres, with a combined value of ₹883.90 lakhs and an average land price of ₹12.57 lakhs/acre, whereas in CTUP, the same number of transactions involved only 42.17 acres, valued much higher at ₹2116 lakhs, with an average price of ₹63.91 lakhs/acre. Ramalinge Gowda et al. (2012) [19] reported similar results in Magadi taluk, Bengaluru district, where in the 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 farms increases and price decreases, and these changes were statistically significant at a one percent level.

The portfolio management of land sale proceeds is represented in Table 3. The analysis of land sale proceeds in BTHL and CTUP highlights distinct patterns of portfolio management, reflecting their socio-economic priorities. In BTHL, 80.59 percent of the proceeds were allocated to asset-based portfolios, with a significant focus on clearing old debts (29.44%) and investments in agriculture (21.71%), such as irrigation structures (9.39%) and machinery (6.36%). Housing and real estate accounted for 22.28 percent, predominantly for house construction, while spending on gold, vehicles, and household assets was relatively modest (6.28%). In contrast, CTUP allocated 72.56 percent of its proceeds to asset-based portfolios, with housing and real estate dominating at 31.18 percent, primarily for house construction (26.41%). Investments in non-farm businesses (4.63%) and financial assets like bank savings (4.52%) were more prominent in CTUP compared to BTHL.

Non-asset-based spending revealed further contrasts. In BTHL, 19.41 percent of proceeds were allocated to non-asset-based uses, mainly for social ceremonies like marriages (13.13%) and education (4.30%). CTUP, however, allocated 27.44 percent to this category, with higher spending on wasteful consumption (5.55%), social ceremonies (12.28%), and education (5.23%). Additionally, CTUP allocated 2.89 percent of its proceeds for bequeathing to girl children, a practice absents in BTHL.

Overall, the results underscore the divergent priorities of rural and urban households. BTHL's emphasis on debt repayment and agricultural investments reflects its agrarian lifestyle and financial challenges, while CTUP's focus on real estate, business ventures, and lifestyle improvements illustrates urban aspirations and economic diversity. Harish and Chinnappa (2017) [3] reported similar results in North Bengaluru and it was also found that around 32 percent of the total land sale proceeds were used for house construction and about 16 percent of proceeds were used for wasteful consumption purposes like performing marriages/other family functions, gambling, and others.

Table 3: Portfolio management of land sale proceeds in BTHL and CTUP (lakh rupees)

Sl. No.	Portfolios	BTHL	CTUP
	A. **Asset based portfolio**		
A1.	**Housing and real estate**		
1	Construction of house	2.80(22.28)	16.88(26.41)
2	Purchase of plot or site or flat	0(0.00)	3.05(4.77)
	Sub-total	2.80(22.28)	19.93(31.18)
A2.	**Gold, Vehicles and household assets**		
3	Purchase of liquid assets like gold	0.22(1.75)	2.94(4.60)
4	Purchase of household materials like sofas, dining table, computer etc…	0.15(1.19)	1.92(3.00)
5	Purchase of vehicles	0.42(3.34)	1.8(2.82)
	Sub-total	0.79(6.28)	6.66(10.42)
A3.	**Financial assets**		
6	Bank savings	0(0.00)	2.89(4.52)
7	Towards clearing old debts	3.7(29.44)	7.06(11.05)
	Sub-total	3.7(29.44)	9.95(15.57)
A4.	**Agriculture**		
8	Investment in agriculture in the form of agriculture machinery	0.80(6.36)	2.24(3.50)
9	Investment in agriculture in the form irrigation structure i.e. bore well	1.18(9.39)	1.85(2.89)
10	Investment in agriculture in the form of orchard establishment	0.59(4.69)	1.44(2.25)
11	Purchase of agricultural land	0.16(1.27)	1.35(2.11)
	Sub-total	2.73(21.71)	6.88(10.76)
A5.	**Non-farm business**		
12	Invested in non-farm business	0.11(0.88)	2.95(4.63)
	Subtotal (A1+A2+A3+A4+A5)	10.13(80.59)	46.37(72.56)
	B. **Non-asset based portfolio**		
B1.	Bequeathing		
13	Shared among girl children	0(0.00)	1.85(2.89)
B2.	**Wasteful Consumption**		
14	Conspicuous and wasteful consumption	0.12(0.95)	3.55(5.55)
B3.	**Social ceremonies**		
15	Marriage and other ceremonies	1.65(13.13)	7.85(12.28)
B4.	**Education**		
16	Children education	0.54(4.30)	3.34(5.23)
B5.	**Health**		
17	Hospital expenses	0.13(1.03)	0.95(1.49)
	Subtotal (B1+B2+B3+B4+B5)	2.44(19.41)	17.54(27.44)
	Total	12.57(100.00)	63.91(100.00)

Note: Figures in parentheses represent percentages to total

Sentiment analysis on farmland sales in BTHL

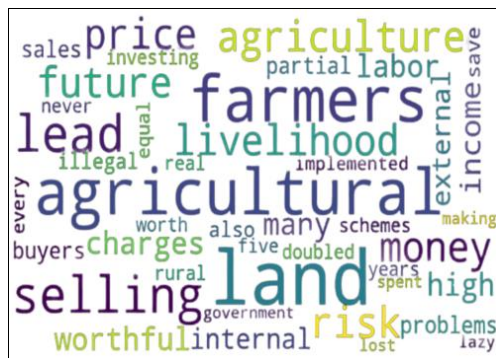**Fig 2:** Word cloud for positive sentiments in BTHL

Fig 3: Word cloud for negative sentiments in BTHL

The word cloud in Figure 2 represents the positive sentiments expressed by respondents in BTHL regarding farmland sales. Prominent terms such as land, agriculture, farmers, and price indicate a focus on the economic and utility value derived from the transactions. Words like increased, worth, and invested reflect optimism about rising land values and opportunities for reinvestment in assets like real estate, education, and agriculture. Terms like future, useful, and benefited suggest a forward-looking perspective, where land sales are seen as a means to enhance livelihoods and secure financial stability. Additionally, mentions of cities, rural, and youth highlight the dynamic between urbanization and rural development, emphasizing the role of land sales in fostering opportunities for younger generations. Overall, the word cloud captures how positive sentiments stem from perceived economic benefits and improved quality of life due to farmland sales.

Figure 3 illustrates the word cloud representing negative sentiments regarding farmland sales in BTHL. Prominent terms such as risk, problems, lost, money, and charges suggest concerns about the financial implications and potential losses associated with selling farmland. Words like labor, income, and livelihood highlight the anxiety about losing sources of income and employment in rural areas. The frequent appearance of farmers, land, and agriculture points to the negative consequences of land sales for the agricultural community, particularly in terms of reduced agricultural productivity and the erosion of traditional farming practices. Overall, the word cloud reflects a prevalent sentiment of uncertainty and discontent regarding the social, economic, and environmental costs of farmland sales.

Sentiment analysis on farmland sales in CTUP

Fig 4: Word cloud for positive sentiments in CTUP

Fig 5: Word cloud for negative sentiments in CTUP

The word cloud in Figure 4 represents the positive sentiments expressed by respondents in CTUP regarding farmland sales. Words like price, land, agriculture, and future dominate, suggesting optimism about the increasing value of agricultural land and its potential for investment. Terms such as invested, increased, and selling reflect heightened market activity and profitability in farmland transactions. Keywords like purposes, construction, and formation point to the diverse uses of these lands, such as for urban development, orchards, or infrastructure projects, which create economic opportunities for landowners and buyers. The mention of highway and cities highlights the strategic importance of these lands due to their proximity to urban centres and transportation networks, making them attractive for real estate and commercial development. Supporting this trend, Pankaj *et al*. (2021) [7] explored farmers' satisfaction and happiness following land sales for urban expansion in Gurugram, Haryana, India. Their study found that changes in income sources and spending patterns-such as shifts to rental income, increased investment in children's education, household items, gadgets, vehicles, shopping, leisure, and social events-positively and significantly influenced farmers' satisfaction levels.

Figure 5 illustrates the word cloud representing negative sentiments regarding farmland sales in CTUP. Words like problem, risk, forced, and marginalization indicate critical challenges faced by agricultural landowners and stakeholders. Issues like remoteness, conversion, and price reflect concerns about the undervaluation of land, forced sales, or transitions to non-agricultural uses that may jeopardize traditional livelihoods. Overall, the word cloud illustrates significant risks and disruptions associated with farmland sales, emphasizing the need for regulatory interventions, sustainable practices, and fair market mechanisms to address these issues.

Table 4: Sentiment segmentation in BTHL and CTUP

Sentiments	Distribution (%) in BTHL	Distribution (%) in CTUP
Negative	37.5	43.47
Neutral	18.75	23.91
Positive	18.75	13.07
Very negative	15.63	10.86
Very positive	9.37	8.69

The sentiment segmentation analysis of farmland sales in BTHL and CTUP, as presented in Table 4, highlights notable differences in the emotional responses of farmers towards land sales across the two regions. In both regions, negative sentiments dominate, with 37.5% in BTHL and a significantly higher 43.47% in CTUP. This indicates a general sense of dissatisfaction or apprehension among farmers, likely stemming from the challenges associated with the sale of farmlands, such as the loss of traditional livelihoods or concerns about future land use. Neutral sentiments account for 18.75% in BTHL and 23.91% in CTUP, reflecting a considerable proportion of farmers who view the transactions pragmatically, likely weighing the economic benefits against the loss of land. The presence of positive sentiments (18.75% in BTHL and 13.07% in CTUP) suggests that some farmers perceive the sale as an opportunity to capitalize on rising land values, particularly in the urban periphery where real estate demand is surging.

Interestingly, extreme sentiments—very negative and very positive—reveal additional insights. Very negative sentiments are observed in 15.63 percent of BTHL respondents and 10.86 percent of CTUP respondents, reflecting deep regret or dissatisfaction, possibly from those forced to sell land due to financial pressures. On the other hand, very positive sentiments are reported by 9.37 percent in BTHL and 8.69 percent in CTUP, indicating that a minority of farmers view the sale as transformative, enabling them to invest in alternative livelihoods or secure long-term financial stability. The higher share of negative sentiments in CTUP may be attributed to rapid urbanization, which often pressures farmers to sell land under circumstances they might not fully favour. Conversely, the more balanced sentiment distribution in BTHL suggests a slower pace of urban influence, allowing farmers more agency in their decision-making process. These findings underscore the emotional complexity of farmland sales and the socio-economic pressures farmers face during transitions driven by urban expansion.

Conclusion
The study highlights the significant impact of urbanization and infrastructure development on farmland values and farmers' socio-economic priorities in BTHL and CTUP. Land values increased substantially from 2000 to 2020, with CTUP experiencing sharper growth due to its proximity to urban centres and major infrastructure projects. Farmers in BTHL prioritized debt repayment and agricultural investments, reflecting their agrarian economy, while CTUP farmers focused more on real estate and lifestyle improvements, driven by urban aspirations. Sentiment analysis revealed predominantly negative emotions in both regions, with CTUP showing higher dissatisfaction due to forced sales and loss of traditional livelihoods. However, a minority viewed land sales positively, citing opportunities for financial growth and investments in education, real estate, and alternative livelihoods. These findings underscore the need for policies ensuring fair compensation, safeguarding livelihoods, promoting sustainable land use, and providing financial literacy and non-farm employment opportunities to address socio-economic challenges and foster balanced rural-urban transitions.

References
1. Chakravorty S. The price of land: Acquisition, conflict and consequence. N. Delhi: Oxford University Press; c2013.
2. Fairbairn M. Like gold with yield: Evolving intersections between farmland and finance. J Peasant Stud. 2014;41(5):777-795.
3. Harish Kumar HV, Chinnappa Reddy BV. Farm land values and portfolio management in rural-urban continuum of Bengaluru north. Mysore J Agric Sci. 2017;51(2):208-215.
4. Kavitha A, Somashekar RK, Nagaraja BC. Urban expansion and loss of agricultural land: A case of Bengaluru city. Int J Geomatics Geosci. 2015;5(3):492-498.
5. Janssen L, Pflueger B. South Dakota agricultural land market trends 1991-2012. South Dakota State University, South Dakota; c2012. p. 1-28.
6. Li J, Deng X, Seto KC. The impact of urban expansion on agricultural land use intensity in China. Land Use Pol. 2013;35:33-39.
7. Pankaj K, Parveen Kumar, Garg RK. A study on farmers' satisfaction and happiness after the land sale for urban expansion in India. Land Use Policy. 2021;109(4):58-72.
8. Rajshekar M. Great rural land rush: 3 to 100-fold rise in farmland prices may not bode well. Economic Times. 2013 Nov 12.
9. Ramalinge Gowda UC, Chandrakanth MG, Srikantha Murthy PS, Yadav CG, Nagaraj N, Channaveer. Economics of peri-urban agriculture: Case of Magadi off Bangalore. Econ Pol Weekly. 2012;47(24):75-80.
10. Sabarathanam VE. Manuals of field experience training for ARS scientists. NAARM, Hyderabad; c1988.
11. Santhakumar Swamiduari. Factors affecting urban land value in Indian cities: Chennai city as a case study. Int J Res Scientific Innovation. 2014;1(3):31-34.
12. Seema Rani. Monitoring land use/land cover response to urban growth of the city of Jalandhar using remote sensing data. Int J Adv Res. 2014;2(6):1122-1129.
13. Vijayabaskar M, Menon A. Dispossession by neglect: Agricultural land sales in the periphery of Chennai. J Agrarian Change. 2016;1(5):7-25.
14. Xiaowei Cai, Noel JE. California farmland valuation: A hedonic approach. Poster presented at: Agric Appl. Econ. Assoc Joint Annual Meeting; c2013 Aug 4-6.