A micro level study on factors influencing selling of agricultural lands in western zone of Tamil Nadu

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ABSTRACT

Land is a finite natural national resource, directly link with all economic development activities especially agricultural production highly depend upon large scale of land due to inefficiency in production. India is a land scarce country where per capita cultivated land is only around 0.15 ha (Planning Commission 2011). Agricultural land conversion is a process by which land is changed from agricultural purposes to urban and industrial uses. The study was conducted to identify the factors influence of land sale among the respondents in western zone of Tamilnadu. The findings revealed, self occupation, progeny occupation and presence of business and community organization in the locality most significant factors influence on land sales.

KEY WORDS : *Land sale, Factors influences, Self-occupation*

Land is a finite natural national resource, directly link with all economic development activities especially agricultural production highly depend upon large scale of land due to inefficiency in production. India is a land scarce country where per capita cultivated land is only around 0.15 ha (Planning Commission, 2011). Agricultural Land conversion is a process by which land is changed from agricultural purposes to urban and industrial uses. These are two main drivers of agricultural land conversion in India resulting in loss of productive arable lands. Resource shortage, labour shortage, institutional limitations and environmental degradation are grass root constraints affect the farm household's profitability. Another side the value of agricultural land got appreciation due to industrialization and urbanization. Keeping this view the study was conducted to identify the determinant factors selling behavior of land among the farm households in western zone of Tamilnadu. The Western zone comprises of Coimbatore, Tirupur and Erode districts one of the industrial and urbanized zone in Tamilnadu state. The main objectives of the study to study the factors influencing selling decision of agricultural lands and to find out the perception of land conversion.

Shunji and Ruth Kattumuri (2010) studied the cultivated land conversion in China and the potential for food security and sustainability in China. They investigated the relationship between cultivated land, environment, and food security in China; and seeks to identity the main challenges facing China in terms of arable land protection. It further discussed the concept and practical implications of land governance in relation to food and environmental security, and suggested that comprehensive, human-centred and sustainable land governance is required to enhance China's food security and environmental sustainability.

Quasem (2011) revealed that, the total land owned by a household, near to urban area and the area under homestead and non-agricultural occupation of the household heads also

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encourages land conversion in Bangladesh. The main non-agricultural uses of converted land were identified to be housing, road construction, business establishment and educational and health organizations occupying 55,10,8 and 3 per cent of the converted land, respectively.

METHODOLOGY

The western zone of Tamilnadu comprising Coimbatore, Tirupur and Erode were purposively selected for the study as on one of the industrial and urbanized zone which is relatively higher than other districts of Tamilnadu. From the selected districts two blocks were selected from each district which was nearer to city. Villages were selected on the basis of the locality. From the selected villages the respondents were identified with two categories. The first category was land sellers and second category was farmers who are continuing agriculture. Thus, totally 130 respondents in first group and 72 from second group respondents were surveyed with pretested interview schedule.

Tools of analysis :

Logistic regression analysis was carried out to quantify the relative importance of factors influencing farmers' decision to sell of farm land. In logistic regression analysis, the farm land converters and non-converters were included, as farmers were only indulged in land sale activity. In farmland sale decision selling of farm land was a dichotomous-dependent variable. Its determinants were assessed using logit model based on logistic cumulative distribution function. This technique has been found useful in situations where we either did not have enough information to study how the actual decisions were made or were just interested in understanding the relative role of factors likely to affect such decisions in a probabilistic sense. The logit technique allowed examination of the effects of a number of variables on the underlying probability of selling farm lands.

The behavioural model used to examine the factors influencing in selling of farmland was :

$$Yi = g\,(Zi) \tag{1}$$
$$Zi = a + S\,bk\,Xki \tag{2}$$

where,

Yi = The observed response of the ith respondent (*i.e.* the binary variable Y_1 = 1 agricultural land converter and Y_2= 0 for a non converter)

Zi = An underlying and unobserved index for the ith respondent (when Z exceeded some threshold Z*, the farmer was observed to be agricultural land converter; otherwise non-converter)

X_{ki} = The kth explanatory variable of ith respondent, i = 1, 2, ………, N, where, N was the number of respondents k = 1, 2, ……..M

M was the total number of explanatory variables a = Constant, and b = Vector of co-efficients

The logit model postulated that Pi, the probability that i^{th} respondent selling of, was a function of an index variable Zi summarizing a set of the explanatory variables. In fact, Zi was equal to the logarithm of the odds ratio, *i.e.* the ratio of probability that the respondent selling of farmland to the probability that he do not selling farm land and it could be estimated as a linear function of explanatory variable (Xki). This could be mathematically expressed as :

$$Z_i\, N \ln \frac{P_i}{1-P_i}\quad N\, a < \overset{M}{\underset{kN1}{S}} b_k X_{ki} \tag{3}$$

Equation (3) was the logit model (Pindyck and Rubinfeld, 1981), and once this equation was estimated, Pi could be calculated :

$$P_i\; N\, f^0 Z_i\; ^. N\, f^0 a < sbx_i\; ^. N \frac{1}{1 < e^{-zi}} \tag{4}$$

$$N \frac{1}{1 < e^{-\frac{0}{a} < sb_k X_{ki}\; ^.}} \tag{5}$$

where, 'e' represents base of the natural logarithms and approximately equals to 2.718

The goodness of fit of the model was tested by three approaches. Firstly, predictions were compared with the observed outcomes and expressed in percentage of correctly predicted. Secondly, 2-times the log of the likelihood (-2LL) estimate was used as a measure of how well the estimated model fitted the data. A good model was one that resulted in a high likelihood of the observed results.

Empirical model :

The empirical model was applied to identify the factors influencing of agricultural land sale among the respondents. Selling of agricultural land to non-agriculture is dependent on a variety of factors such as number of members in a family, income earning possibilities from agriculture and non-agriculture uses of land besides state acquisition for construction of roads and institutional building, etc. Logit analyses in this regard can provide better explanation by identifying the factors that determine the amount of land area to be converted to non-agriculture by the households. To this end, of model is fitted taking into account several explanatory variables. The independent variables used in the model are.

The index variable Zi indicating whether a respondent or not, was expressed as a function of the above listed variables as :

$$Zi = a + b_1 AGE\; + b_2 AREAOWN + b_3\,PNC + b_4 FRAGMENT + b_5 EDUCAUTION + b_6 POCCUPATION + + b_7 PROGENY\;OCCUPATION + b_8 LPI + b_9 WQI + b_{10} AAAI + b_{10}\,FARMDISTANCE + b_{11} PEII + b_{12} SAD + Ui$$

where, Ui is the disturbance-term.

Age (Age of the respondent during conversion time) :

This is a continuous independent variable indicating the age of the respondents in years. Farming requires lot of physical work and aged respondents face difficult to manage farming. Therefore, *a-priori* expectation was that the probability of selling agricultural land was indirectly related to age of the respondents.

Areaown (At conversion period):

Farm-size was one of the important factors influencing in selling of agricultural land. The total operational holding was likely to affect the probability of selling of agricultural land due to the reason that large size ownership. Selling a small proportion of land not that much affected the farming. This variable enquired during the conversion time. Therefore, *a-priori* expectation was that the probability of selling agricultural was directly related to the size of farm.

PNC (Proportion of non-crop land to total land owned):

The non crop land area is most influencing in selling of agricultural land. Therefore, expected *apriori* that a farmer with high proportion of non crop land area was relatively more likely to selling of agricultural land.

Fragment (at conversion period):

Selling of agricultural land was crucially dependent on the degree of fragmentation of farm-holding. With dispersed holding, it was presumed to be more difficult for management all the land of a farmer than if the land was in a consolidated parcel. Therefore, expected *a priori* that a farmer with high degree of fragmentation was relatively more likely to selling of agricultural land.

Education :

Education increased the ability of respondent to interpret, understand and modify new information. Thus, it was treated as a proxy for farmer's managerial ability. It was, therefore, hypothesized that the probability of purchasing water by a farmer was inversely related to the farmer's education.

P-OCCUP (Primary occupation of the respondents):

Occupation of the respondent highly influencing in decision sale of farmland decision. If the respondent primary dependent on non agriculture he earning non farm income and may be not willing to continue agriculture. Therefore, *a-priori* expectation was that the probability of selling farmland was inversely related to the primary occupation of the respondent.

Progeny occupation :

Most of the farmer's progeny unwilling to continue the farming due to various social factors. Therefore, *a-priori* expectation was that the probability of selling agricultural land was directly related to the progeny occupation.

Land productivity index (Poor -1, Average -2, Good – 3):

Higher land productivity index assured the more profitability of the farm and low productivity index leads to lower level of farm profitability. Farmers are generally not willing to continue farming in poor and degraded land. Therefore, *a-priori* expectation was that the probability of selling agricultural land was inversely related to the land productivity index.

Water quality index (Poor -1, Average -2, Good – 3):

The water quality index of area highly influencing in selling decision of agricultural land. the farm output in poor water quality area is comparatively low and difficult to manage the situation. Therefore, *a-priori* expectation was that the probability of selling agricultural land was inversely related to the water quality index.

AAAI (Access to assured and adequate irrigation) :

Highly assured =3;Moderately assured = 2 Low Assurance= 1, Rainfed =0)Access to assured and adequate irrigation help to better farming practices and adopt more commercial crops and maintain subsistence farming. Therefore, *a-priori* expectation was that the probability of selling agricultural land was inversely related to the access to assured and adequate irrigation.

Farm distance (Distance of the farm from the main road):

It refers to the average distance of a farm from the main road highly influencing in selling of agricultural land. Road side land highly demand for sites and other commercial purposes and they also offer good price for the land and farmers are more willing in selling of agricultural land. But in case of interior farm land demand for non agricultural uses comparatively low than road side land. Therefore, *a-priori* expectation was that the probability of selling agricultural land was inversely related to the farm distance to the main road. (Fitsum and Holden, 2003; Berhanu and Swinton, 2003).

PEII (Presence of education institutions and industries in near to farm):

Presence of above they likely need additional land for further improvement. Particularly they offered more price for the and likely more pulling in agricultural land.

Study area dummy (Rural = 0, Peri-urban =1, urban = 2, Metro =3):

It is also influencing in converting of agricultural lands. Generally the demand for land in urban areas relatively more

high and market value of land also high. This automatically pulls the the farmers in converting agricultural land.

ANALYSIS AND DISCUSSION

The findings of the present study as well as relevent discussion have been presented below :

General characters of sample respondents :

The age and literacy of respondents are the important factors which could influence the decisions of land selling. Traditionally, the head of the household takes various decisions and influences the members of the farm family. Thus, the age and literacy of the head of households was analyzed and presented in Table 1.

Factor influencing selling decision of agricultural land :

The factors influence land sale among sellers depend on the various socio-economic conditions. The data were collected from land sellers and non-converters in same locality.

The relative importance of these factors was quantified by using a logit regression sale of agricultural was a binary variable. The important variables selected and maximum likelihood estimates of the co-efficients of logistic regression analysis are presented in Table 2. The interpretation of results slightly differs from normal interpretation. In the results positive signs indicated factors influence on land sale and negative sign indicate factors influence not selling the land among non converters. The model fitted very well to the data as indicated by large observed significance of log likelihood ratio test. The results of the logistic regression analysis suggested that the most significant factors influence on sale of land were self occupation, progeny occupation and presence of business and community organization in the locality. On other side assurance of irrigation and farm

Table 1 : General characters of sample respondents		Agricultural land sellers	Non-sellers
General particulars		Agricultural land sellers	Non-sellers
Age (In years)	upto 40	27 (20.77)	13 (18.06)
	41 to 50	41 (31.54)	24 (33.33)
	50 to 60	35 (26.92)	26 (36.11)
	More than 60	27 (20.77)	9 (12.50)
Literacy level	Illiterate	1 (0.77)	0 (0.00)
	Primary	7 (5.38)	4 (5.56)
	High school	42 (32.31)	34 (47.22)
	Higher secondary	31 (23.85)	17 (23.61)
	Degrees	49 (37.69)	17 (23.61)
Total		130 (100)	72 (100)

Table 2 : Results of logit analysis					Agricultural land sellers -1, Non sellers - 0	
Sr. No.	Variables	Coefficient	Standard error	T ratio	Odds ratio	Probability
1.	Intercept	3.444	2.207	1.560	–	–
2.	Age	-0.046	0.036	-1.285	0.955	0.49
3.	Land fragmentation	0.068	0.113	0.602	1.070	0.52
4.	Self occupation	1.016	0.234	1.901	2.762	0.73
5.	Progeny occupation	1.751	0.623	2.812	5.759	0.85
6.	Education	0.059	0.102	0.582	1.061	0.51
7.	Area owned	-0.068	0.064	-1.056	0.934	0.48
8.	Proportion of cultivable area	0.018	0.022	0.816	1.018	0.50
9.	Land quality index	-0.050	0.086	-0.578	0.952	0.49
10.	Assurance of irrigation	-1.134	0.642	-1.767	0.322	0.24
11.	Water quality index	-0.045	0.536	-0.084	0.956	0.49
12.	Farm distance	-0.002	0.001	-5.952	0.998	0.50
13.	Presence of business & community organization	1.260	0.503	2.508	1.017	0.50
14.	Study area dummy	0.017	0.585	0.028	3.527	0.78
15.	-2Log likelihood			42.067		
16.	No. of samples			202		

distance to main road are the most significant factors influence on not sale the agricultural land. The estimation yielded the expected signs for the independent variables according to the *a priori* expectation.

From the results of logistic regression analysis it could be inferred that better occupational of converter respondents and their progeny increase the probability of land sale by 73 per cent and 85 per cent, respectively. It cleared that, better occupation status assured non farm income to the family and not willing to continue farm activities. The other important factor was presence of business and community organization in the locality increase the probability of land sale by 50 per cent. The offered more price likely more pulling in agricultural land for their extension of business.

Another other side assurance of irrigation major influence of on not selling the land. By increase the assurance of irrigation, reduce the probability of land selling decision by 24 per cent. The distance of farm to main road also reduces the land sale. The probability of selling agricultural land has reduced to 50 per cent by with one unit increase of distance of farm to main road.

Factors like land fragmentation (52 %), education (43%) and proportion of uncultivable area (48%) had positive effects on selling agricultural land though these co-efficients turned out to be non-significant. This implied that the farmer's age, land fragmentation, education level of respondents and proportion of uncultivated area had increased the probability of agricultural land sale. Factors like age (49 %) total land area (48%), Land productivity index and water quality index had effects (negative sign) on not selling agricultural land, though these co-efficients turned out to be non-significant.

Perception about agricultural land sales opinioned by the respondents :

Perception regarding agricultural land sales was enquired with various statements (Table 3). Around 60 of sample respondents opinioned that land sale decision was wrong. Few respondents opinioned that no option to avoid land sale because the acquisition for government projects. Nearly half of the respondents (47.5 per cent), felt that sale value of land was low**.** The remaining respondents felt that the value land was moderate or high. Half of the sample respondents, opinioned that economic and social status after land was increased but the remaining proportion not felt any increase in status. Within them few of the respondents have felt that economic and social status was reduced after land sale. It was noted that nearly 40 per cent opinioned food consumption status was decreased. But most of the respondents the housing facilities were increased after land sales.

Conclusion :

Land used for non-agricultural purpose had merits of industrial and urban development's but loss of highly productive agricultural lands affect the food security. Protection of agricultural lands has to take various policy measures taken at micro level, hence to avoid land used for non-agricultural purposes. Based on the findings of the study, self-occupation, progeny occupation and presence of business and community organization in the locality most significant factors influence on land sales. On other side assurance of irrigation and farm distance to main road are the most significant factors influence on not sale the agricultural land. In this view, at farm level better irrigation arrangements

Sr. No.	Particulars		Number	Per cent
1.	General opinion of agricultural land conversion	Right decision	16	40
		Wrong decision	24	60
		No other choice	0	0
2.	Perception about sale value of agricultural land	Low	19	47.5
		Medium	12	30
		High	9	22.5
3.	Economic status after agricultural conversion	Increased	20	50
		Unchanged	11	27.5
		Deceased	9	22.5
4	Social status after agricultural conversion	Increased	20	50
		Deceased	20	50
5	Food consumption status after agricultural land sale	Increased	17	42.5
		Unchanged	7	17.5
		Decreased	16	40
6	Housing facilities after agricultural land sale	Increased	23	57.5
		Unchanged	17	42.5
		Decreased	0	0

Table 3 : Perception about agricultural land sale opinioned by the respondents

help to avoid the agricultural land sale. Control of agricultural land sale near to main roads with altering the existing legal measures.

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