Volume 5 Issue 1 December 2016 ISSN: 2319- 961X

FACTORS RESPONSIBLE FOR CONVERSION OF AGRICULTURAL LAND INTO OTHER PURPOSES IN TIRUNELVELI DISTRICT

Dr.S.Paramasivan

Assistant Professor, PG and Research Department of Economics, The M.D.T. Hindu College, Tirunelveli-10

Abstract

Land is the mother of all factors and the source of all wealth on earth. The contribution of land for human living and welfare has been immense and valuable. The economic activities involving land and particularly cultivation are known as agriculture. Agriculture has been the primary sector of any economy from the time immemorial. The discusses how far the factors, especially the physical factors such as irrigation pattern, soil type, size of farm and rainfall level influence the conversion of agriculture lands of Tirunelveli district during the period of 2000-01 to 2009-10.In the present study the factors influencing conversion of agricultural lands in Tirunelveli district are classified into three, namely, (i) physical factors (ii) agro-biological (technical) factors and (iii) economic factors. The physical factors are analysed at the district level (macro level) and the economic and agro-biological factors (technical factors) are discussed at farm level (micro-level). The influence of physical factors in the conversion of Agricultural lands of the district during 2000-01 to 2009-10 are discussed with the help of secondary data.

Keywords: *irrigation pattern, soil type, agro-biological factors, Agricultural lands, Conversion of Land, gross cropped area*

Conversion of Land

In Triunelveli district, paddy is the main crop cultivated in wet lands during all the crop seasons. In garden lands, crops like paddy, banana, chillies, Banana, sugarcane, banana, Onion, vegetables and millets are the important crops. In dry lands, Maize, Black gram, Green gram, Banana, Banana, gingelly and minor millets are grown. The crops like rice, Black gram, Green gram, Maize, banana and Banana occupy more than 70.0 per cent of the total cropped area of the district.

Factors Responsible for Conversion of Agricultural Lands

The conversion of the lands of the district during the period 2000-01 to 2009-10, may be the result of physical, agro-biological (technical) and economic factors which determine the land conversion of an area. In the present study, secondary data collected for the period from 2000-01 to 2009–10 are used to analyse the influence of physical factors in determining the conversion of lands of the Tirunelveli district.

Importance of Physical Factors in Designing the Conversion of Agricultural Lands In Tirunelveli District During 2000-01 to 2009-10

In the present analysis, the physical factors influencing the conversion of Agriculture lands are classified into four namely,

(i) Irrigational facilities,

(ii) Climate (rainfall)

For analyzing the impact of irrigation and climate (rainfall) on conversion data for 10 years, (2000-01 to 2009–10) regarding area irrigated under crops and rainfall level are used. Secondary information regarding area under crops in different size of farm is available only from World Agricultural Census (2000 – 01). Therefore, analysis of size of farm on conversion pattern is done by using this census report.

Conversion of Land Due to Irrigation

Irrigation is one of the physical factors which influences the area under cultivation of crops in any region. A substantial increase in area under a crop and agricultural productivity per hectare can be secured with the help of proper irrigation. Irrigational facilities together with adequate supply of inputs like manures, pesticides and others must lead to increase in the productivity of crops. The development of irrigation helps to raise the general level of output of the farmer. The Purpose of the study is to examine the land has been converted into other purpose due to lack of irrigation facilities in the district.

Decline in Area Irrigated under Non-Food Crops

To understand whether area under non-food crops has been declined, gross cropped area under crops and gross area irrigated under crops are collected for the district during the period 2000-01 to 2009–10. The study period (10 years) is classified into four sub-periods to make a comparative analysis.

Table 1 Percentage Changes in Area Irrigated Under Different Crops in Tirunelveli District During 2000-01 To 2009-10

Crops	2000-01	2001-02	2002-03	2003-04	2004-05	2005-06	2006-07	2007-08	2008-09	2009-10
Food Crops	69.89	66.52	64.22	64.06	60.20	59.40	57.30	56.40	55.90	54.71
Non-Food Crops	15.59	14.55	14.55	12.03	9.17	9.04	8.56	8.27	7.79	7.54

Table 1 explains the percentage change in irrigated under crops during 2000-01 2009-10. The percentage change in area irrigated under different food crops is negative.

Similar results were also witnessed in the case of non-food crops during the study period. Table 1.2 shows the percentage of irrigated area under food crops has declined from 68.89 per cent in 2000-01 to 54.71 per cent in 2009-10. Similar results have been obtained in the case of non-food crops from 15.59 per cent in 2000-01 to 7.54 per cent in 2009-10.

Thus it is observed in Tirunelveli district that the decline in total area irrigated leads to conversion of agricultural land into use of other purposes.

In order to find out the trend and growth of area irrigated under food and non-food crops, the semi-log linear trend equation was fitted. The results are presented in Table 2.

Table 2 Trends in Area Irrigated Under Food and Non-Food Crops From 2000-01 to 2009-10

Sl.No	Particulars	a	b	R^2	Compound Growth Rate
1.	Area irrigated under Food Crops	10.8063 (0.3178)	-0.0482 (0.0329)	0.1334	-4.7107
2.	Area irrigated under Non-food Crops	9.6082 (0.0857)	-0.0885 (0.0089)	0.8869	-8.4726
3.	Area irrigated under total	8.6355 (0.1741)	-0.1220 (0.0180)	0.7664	-12.980

Significant at 5% level

Figure in brackets indicate the t-values.

It is inferred from Table 2 that the trend and growth rates are declined for area irrigated under food, non-food and overall crops in Tirunelveli district during the period 2000-01 to 2009-10. The growth rates are -4.7107, -8.4726 and -12.9800 respectively for food, non-food and overall crops. Thus, it may be understood from the analysis that the decline in irrigated area indicates the conversion of agricultural land into some other purposes.

Rainfall and Conversion of Land

To examine the influence of rainfall on the conversion of agricultural land into commercial purposes, rainfall-crop relationship in Tirunelveli district has been studied. Tirunelveli district get most of its rainfall from south-west monsoon (June – September) and North – East monsoon (October – December). Therefore, for the analysis of rainfall – crop relationship, these two monsoons are taken into consideration. Among the six selected crops, three crops namely paddy, banana Banana are taken into consideration, as these three crops only get rainfall in these two monsoons.

To determine the effects of rainfall on the yield per hectare of Paddy, Banana and Banana, the multiple regression model in the form,

$Y = B_0 + b_1X_1 + b_2X_2 + b_3X_3 + b_4X_4 + b_5X_5 + b_6X_6 + b_7X_7 + u$ is used,

Where b_0 is coefficient

Y s yield per hectare in kilograms

X_1 is rainfall in mms in June

X_s is rainfall in mms in July

X_3 is rainfall in mms in August

X_4 is rainfall in mms in June

X_5 is rainfall in mms in October

X_6 is rainfall in mms in November

X_7 is rainfall in mms in December

and

u refers to error variable

On the whole, three equations are made for three major irrigated crops namely paddy, Banana and Banana. The data on yield per hectare and the rainfall during each monsoon are taken from Season and Crop Reports of Tamil Nadu and District Statistical Hand Books of Assistant Director of Statistics at Tirunelveli. The results of multiple regression analysis in the form of above equations have been given in Table 3.

Table 3 Results of Multiple Regression of Yield on Rainfall

Model : $Y = B_0 + b_1 x_1 + b_2 x_2 + b_3 x_3 + b_4 x_4 + b_5 x_5 + b_6 x_6 + b_7x_7 + u$

Y= Yield per hectare in kgs.

X_1 andX^7 = Rainfall from June to December

Time Period	Crops	Equations
2000-01 to 2009-10	Paddy	133062 – 12.10007 x_1 + 5.6139 x_2 – 2.6800 x_3 + 0.5504 x_4 + (4.24) (3.27) (1.64) (2.36) 2.9558 x_5 + 2.2358 x_6 + 0.7072 x_7 (1.00) (0.93 (1.43)
	Banana	812.982 – 2.3455 x_1 + 1.1724 x_2 – 0.1904 x_3 + 1.0015 x_4 (3.63) (2.80) (1.40) (2.02) -0.2355 x_5 + 1.3962 x_6 + 1.9563 x_7 (0.86) (0.80) (1.22)
	Groundnut	165.401 – 1.2548 x_1 + 0.4064 x_2 – 0.2761x_3 + 0.1809 x_4 + (0.96) (0.74) (0.38) (0.53) 0.2731 x_5 + 0.2366 x_6 + 0.0398 x_7 (0.23) (0.21) (0.33)

* Significant at 5 per cent level

Figures in parentheses indicate standard errors of the regression coefficients

As regards the effects of rainfall on the productivity of Paddy in the district, the net effect of rainfall in the month of June is negative, whereas the rainfall effect during October and November is positive and its is significant at five per cent level. The effect of rainfall is negative in the case of Banana and Groundnut. They are significant during the period from June to December. Among the three equations fitted for three crops in Tirunelveli District, significant result is derived for Paddy only and that for only two months namely October and November. It is observed through this analysis that, in Tirunelveli district, there is no close relationship between the rainfall distribution and the success of crops. The same conclusion is also derived when three equations are fitted for rainfall and yield on the basis of two monsoons.

Mann has found in his study, 'in general no direct and close co-relation between the effective rainfall and goodness of the season. He studied the relationship between rainfall and agricultural productivity with reference in four districts in Bombay Deccan. It is a pioneering work on the relationship between rainfall and yield. Roy in his study proved that the rainfall distribution has influenced the productivity of Paddy in the district of Burdwan in West Bengal to some extent In certain months, the effects of rainfall on Paddy productivity are positive and in some months they are negative. Thus it may be inferred that most of the agricultural lands have been converted into commercial purposes due to error rainfall in the study area.

Analysis of Conversion of Land Due to Low Productivity

Compound growth rates of area, productivity and production of the principal crops namely paddy, Black gram, Green gram, Maize Groundnut and Banana have been worked out for the district, for the periods from 2000-01 to 2009–10. The crop growth rate has been noteworthy as to find out, the impact of growth rates of crops on cropping pattern in this district during the study period. Before analysing the compound growth rates of area, productivity and production of principal crops, it is essential to see the area, productivity and production of these selected crops in the district for period 2000-01 to 2009–10.

Views and Opinion of Farmers on Land Conversion

In the previous section, the physical factors responsible for the conversion of land in Tirunelveli district were analysed for the period of 10 years (2000-01 to 2009–10) on the basis of secondary data. It was a macro level study, studying the district as a whole. To discuss the second objective of the study, that is, to examine how far the agro-biological (technical factors) and economic factors were responsible for the conversion of agriculture land in the case of individual farmer. The statistical tools namely, Garrett Ranking

Technique was adopted to identify the economic and Agro biological reasons or converting agricultural lands.

Garrett Ranking Techniques

For analyzing the second objective of the present study namely factors responsible for the cropping pattern in Tirunelveli district during 2009-10, Garrett ranking technique was adopted to S_1 and S_2 farms. The reasons for the adoption of the existing cropping pattern were classified under two broad heads namely, (i) agro-biological reasons and (ii) economic reasons. The agro-biological reasons included.

(i) Introduction of High-yielding varieties
(ii) Increase in Irrigation facilities.
(iii) Suitability of the soil, and
(iv) Availability of fertilizers and manures

The economic factors were,

(i) Easy Availability of credit
(ii) Availability of market facilities
(iii) Availability of labour
(iv) Availability of transport
(v) Fair pPaddy provided by regulated markets, and
(vi) Availability of time for personal attention

The sample farmers were asked to rank these reasons.

Garrett Ranking Technique Analysis

The respondents were 250 small and 250 large farmers in the study area. Paddy was the main crop of this region. The other crops cultivated during 2010 – 11 were sugarcane, banana, Banana, pulses and Maize. How far the agro-biological and economic reasons were responsible for conversion of agricultural land had been analysed and the results are given in Table 4.

Table 4 Results of the Garrett Ranking in Small (S) Large (L) Farms in Tirunelveli District

Sl. No.	Reasons	Small Farms		Large Farms	
		Garrett's Score	Rank	Garrett's Score	Rank
	(A)Agro-biological Reasons:				
1.	Introduction of High-yielding Varieties	90.72	III	85.15	III
2.	Availabilities irrigational facilities	92.14	I	89.16	I
3.	Suitability of the soil	92.63	IV	88.90	IV
4	Availability of Fertilizers and manures	81.36	II	80.18	II

	(B) Economic Reasons				
1.	Easy availability of credit	87.63	III	84.29	II
2.	Availability of market facilities	65.12	V	69.26	V
3.	Availability of labour	74.96	IV	77.16	IV
4.	Availability of transport	61.48	VI	61.76	VI
5.	Fair price provided by regulated markets	93.12	I	89.36	I
6.	Availability of time for personal attention	91.37	II	85.12	III

Source: Computed data.

From Table 4 it is found that, among the four agro-biological factors, availability of irrigational facilities ranks first and availability of fertilizer and manures for both Small and Large farmers. Therefore, it is seen that, availability irrigational facilities are the important agro-biological factors for the conversion of agricultural land in Tirunelveli district.

In the same manner, the influence of economic factors for the conversion of Agricultural land has also been ranked. Among the six economic factors, fair price provided by the regulated market is the main reason for the conversion in both small and Large farmers. Time for personal attention to agricultural activities and the availability of credit facilities are the other two important economic factors influencing the conversion of land in the district.

The application of the Garrett ranking technique in small and Large farm in Tirunelveli district revealed the following points. Suitability of the soil and the increasing irrigational facilities are the two important agro-biological reasons conversion of agricultural lands of both small and Large farms in the district. Therefore, soil structure and irrigation pattern were the most significant factors, converting the agricultural land in Tirunelveli district.

Regarding economic reasons, there is a difference between small and Large farms. Availability of labour is the first and foremost economic reason in small farms. On the other hand, the large farms are most price-conscious. Among the economic reasons in Large farms, fair price secures I Rank in Region I, Region II and Region IV and it secures II Rank in Region II. Thus the change in the price level in the market in the major factor which influences the conversion of agricultural to other purpose by large farms. Market the credit facilities are the other two important economic factors which decide the conversion of land by large farms.

Conclusion

The model log Y = a + bt fitted for area under various crops for the period 2000-01 to 2009–10 reveals the fact that, among these six crops, only area under Banana is increasing significantly and steadily during the study period.

Regarding the productivity of crops, the fit shows that the growth rate of all the six crops are in positive terms and they area also significant. Among the six crops, the growth rate of productivity is high for Banana (21.98 per cent) and low for Banana (1.49 per cent). For other crops this per cent is in between 2.9 to 3.9. one of the reasons for a high growth rate in the productivity of Banana is the relatively low productivity level in the beginning of the study period. This is seen from the intercept value for Banana productivity namely. A = 4.1985; whereas the same for rice productivity is 7.3114.

The semi log model fitted for the six crops show that among the six crops, the trend values of areas, productivity and production are significant but low growth rates are observed. Thus from this model, it is observed that in Tirunelveli district. Low production is the main reason of conversion of Agricultural land into commercial purposes during the period under study.

Reference

1. Wolman, M G and F G A Fournier (editors) (1987), Land Transformation in Agriculture, John Wiley and Sons, Chichester, UK.
2. Richards, J F (1990), “Land transformation” in Turner, B L et al (editors), The Earth as Transformed by Human Action, Cambridge University Press, Cambridge, UK.
3. Blaikie, P and H C Brookfield (1987), Land Degradation and Society, Methuen, London.
4. World Bank (1999), Entering the 21st Century; World Development Report 1999/2000, Oxford University Press, Oxford and New York.
5. Ranade, Aand M S Dev (1998), “Agriculture and rural development” in Parikh, Kirti S (editor), India Development Report, Oxford University Press, New Delhi.
6. Fazal, S (1998), Agricultural Production and Price Mechanism, Chugh Publications, Allahabad.