

## “Transformation of Agriculture Land use in Solapur District”

Dr. Arjun H. Nanawre, Dept of Geography & Research Center,  
Shri Shivaji Mahavidyalaya Barshi, Dist.-Solapur, (MS)

### Abstract:

Agricultural land-use is a proportion of area used to grow different crops during the agricultural year. The cropping pattern is in fact, a reflection of the interplay of the complex social, economic and physical factors. The land use pattern always has been a dynamic phenomenon. Due to influence of dynamic socio economic factors, the cropping pattern also goes on getting modified, so much so, that, some time it is wholly replaced after a sufficiently long span of time. Land use study has key role in scientific study. The study of the agricultural land use not only provides base for understanding the complex structure of agricultural landscape of the region, but also helps for better planning therefore effort is made to study the transformation of agricultural land use. The present paper is based on secondary sources. To determine transformation of agricultural land use, the Karl Pearson's formula i.e. is used. On the basis of value of negative correlation the transformation agricultural land use is determined and conclusions are drawn. The study reveals that area under cereals and pulses are transferred into cash crops such as sugarcane, fruits and vegetable. This transformation is mainly due to the development of surface irrigation facilities because of construction Ujani major irrigation project and use of innovations in agriculture.

Key words: Transformation, Agricultural land-use, Correlation.

### Introduction:

Herculean efforts have been made to increase the agricultural output after Independence in India. This has been made possible through the organized efforts of improving the physical base by utilizing modern inputs, and through the improvement in agricultural practice and crop structure. These processes of planned change in agricultural economy may be called the transformation of agriculture (Jain C. K.1992). No emphasis is too heavy to hammer home the fact that land is a resource of primary importance in the economy of any country and no one land unit can, by nature, be like another (Pal and Shukla, 1992). Agricultural land-use is a proportion of area used to grow different crops during the agricultural

year. In other words cropping patterns are the extent to which the arable land under different agricultural activities can be put to use. The land use pattern always has been a dynamic phenomenon. The cropping pattern is in fact, a reflection of the interplay of the complex social, economic and physical factors. All these factors themselves keep on changing, except the physical ones, which are comparatively static. Thus, under the influence of dynamic socio economic factors, the cropping pattern also goes on getting modified, so much so, that, some time it is wholly replaced after a sufficiently long span of time (Singh Surender, 1992).

Land use / land cover study has key role in scientific study. Throughout the world, emphasis has been given on such study due to

increasing demand for land as it's limited availability (Vaidya & Nannaware, 2013). With the growing pressure of population on limited land resources, man has to use optimum usage of every acre of land. This necessity of determination of optimum use of every piece of land is important. There is consequent need of system of land utilization (Stamp, 1960). Since the time of Recardo, in the beginning of the 19<sup>th</sup> century, studies in the agricultural land use have gained considerable importance. The study of crop association provides an adequate understanding of land and integrative reality that demands distributional analysis (A. Mohammad, 1978). The study of the agricultural land use not only provides base for understanding the complex structure of agricultural landscape of the region, but also helps for better planning therefore effort is made to study the correlation between different agricultural land-use

categories and transformation of agricultural land use.

**Study Region:**

The Solapur District [Area under Study] lies entirely in the Bhima basin of Krishna river system. The district is bounded by 17<sup>0</sup> 10' North to 18<sup>0</sup> 32' North latitudes and 74<sup>0</sup> 42' East to 76<sup>0</sup> 15' East longitudes. The North South stretch of the district is 150 kilometers and East-west extension is 200 kilometers. The Solapur district is fairly well defined to its West as well as to its East by the inward looking scarps of Phaltan range and Osmanabad Plateau respectively. The adjoining districts are Sangli to its Southwest, Satara to its West, Pune to its Northwest, Ahmednagar to its North and Osmanabad to its East and Bijapur district in Karnataka to the South. The district has a total area of 14878 square kilometers with 4317756 populations as per census of 2001.

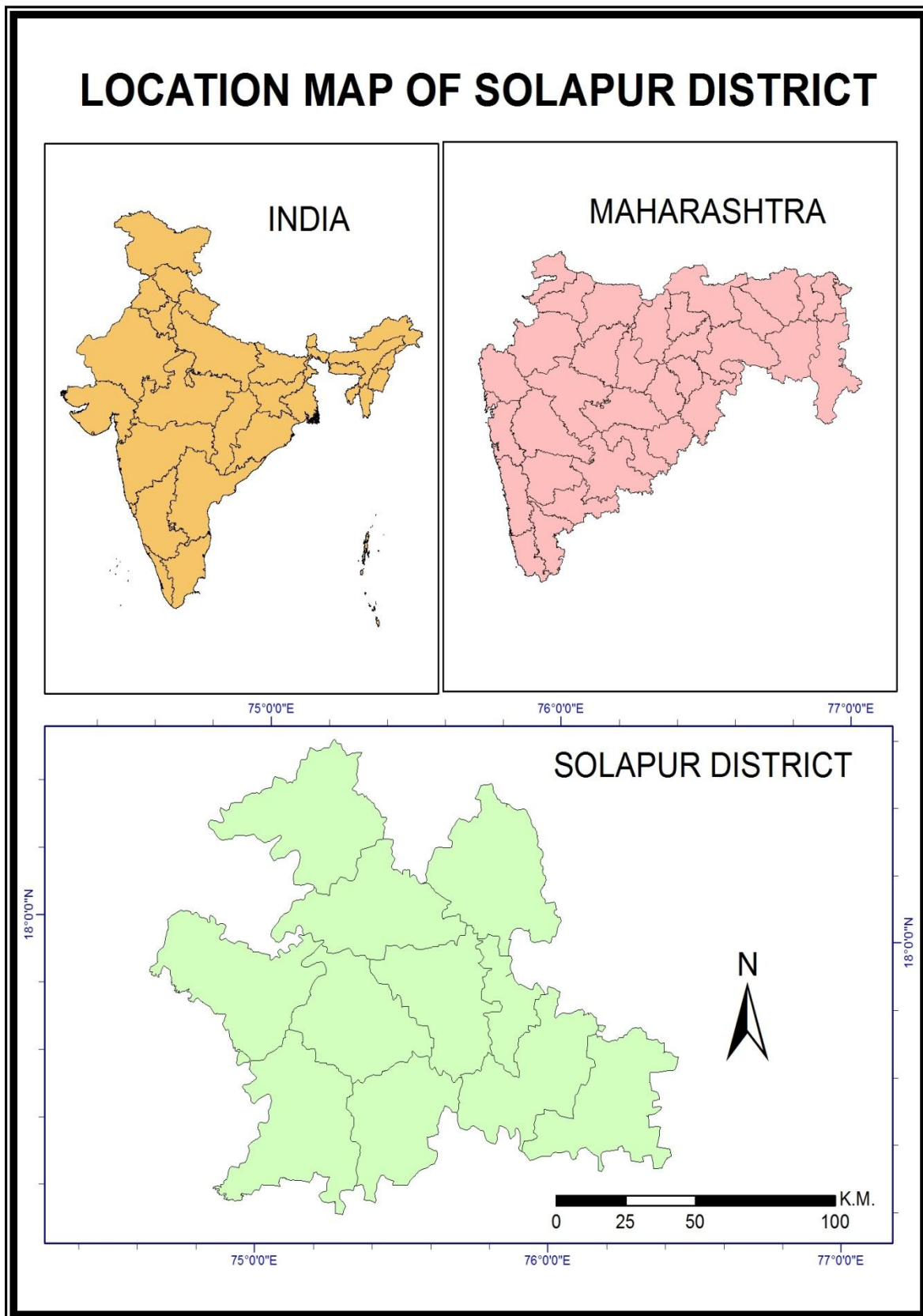


Figure No -1

**Objectives:**

The Main objective of the present paper is to determine and analyze agricultural land use transformation in Solapur District.

**Data collection and methodology:**

The present paper is based on secondary sources. The data regarding area under different crops are collected from Socio Economic Review and Districts Statistical Abstract of Solapur District for the period of 1975-76 to 1999-2000. The data regarding population and location of study area is collected from District Census Hand book and Gazetteers of Solapur District.

Collected data are processed. To avoid fluctuation in area under crops and to get reliable result quinquennial average is taken into consideration. Percentage of area under each crop to total cropped area is calculated. To determine transformation of agricultural land use, the Karl Pearson's formula i. e.

$$r = \frac{\sum xy}{\sqrt{\sum x^2 \sum y^2}}$$

is used and the value of coefficient of correlation is calculated. Correlation between different crop categories gives idea about mutual transfer of area between crops. The total area under various crops has been divided in to five categories Viz. area under cereals, pulses, sugarcane, fruits vegetable and fiber, naturally a change in one followed by a change in another or all

the remaining categories. The co-efficient of correlation of each of the category with rest of the categories have been calculated. On the basis of value of negative correlation the transformation agricultural land use is determined and conclusions are drawn.

**Correlation between Different Agricultural Land-Use Categories and Transformation Agricultural land use:**

1. Transformation of Area under Cereals into other crops:

During the period of investigation, considering the district as a whole, cereals have high negative correlation with oilseeds, which indicates that area under cereals has been transferred into area under the Oilseeds mainly due to development of surface irrigation facilities. Tehsil level analysis reveals that, (table 1B)

I cereals have high negative correlation with fruit-vegetable only in Barshi tehshil, which is amounted by -0.80 co-efficient of correlation, indicates that most of area under cereal crops are converted into area under fruit and vegetable due to increase in irrigated area because of medium irrigation project.

II High negative correlation between cereals and fiber is found only in Pandharpur tehshil, which is amounted by -0.70 co-efficient of correlation.

2. Transformation of Area under Pulses into Sugarcane, fruit vegetable fiber and oilseeds:

Considering the district as a whole, pulses have high negative correlation with sugarcane, fruits-vegetable and oil

seeds, during the period of investigation. However, tehshil level analysis varies, which is as following.

I During the period of under review, high negative correlation between pulses and sugarcane is found in of Mohol, Pandharpur, Malshiras and Karmala tehshils, which is amounted by -0.65,-0.84,-0.79 and -0.76 co-efficient of correlation respectively, indicates that the farmers of these tehshil have brought their cultivated land under sugarcane which was earlier under pulses crops with the availability surface irrigation.

II. Pulses have high negative correlation with fruit-vegetable in the tehshils of North Solapur, Akkalkot, South Solapur, Mohol, Mangalvedha, Pandharpur, Sangola, Malshiras and

Karmala ranging between -0.66 to -0.95 co-efficient of correlation, which reveals that the farmers of these tehshil converted their cultivated land into fruit and vegetable, which was earlier under pulses because of suitable climate for fruit-vegetable, development of technological factors and high income from fruit- vegetable .

III. Pulses have high negative correlation with oilseeds in tehshils of North Solapur and Karmala, the co-efficient of correlation in this regard amounted to be -0.73 and -0.68. During the period of investigation, the area under Pulses decreased considerably in North Solapur and Karmala tehshil, which is converted into area under Oilseeds mainly due to development of surface irrigation facilities.

Table 1 A : Matrix of co-efficient of correlation between different categories of Agricultural land-use of Solapur District:

	Category	A	B	C	D	E	F
Solapur District	A	-	0.34	-0.34	-0.45	0.51	-0.85
	B		-	-0.34	-0.83	0.67	-0.48
	C			-	0.92	-0.90	0.50
	D				-	-0.94	0.65
	E					-	-0.67
	F						-

Note-Where A=Cereals, B=Pulses, C=Sugarcane, D=Fruit-vegetable, E=Fibre, F=Oilseeds

Table 1B : Matrix of co-efficient of correlation between different categories at tehshil level :

I		A	B	C	D	E	F
1. North Solapur	A	-	0.06	-0.40	-0.13	-0.37	-0.02
	B		-	0.34	-0.72	0.70	-0.73
	C			-	-0.06	0.60	-0.14
	D				-	-0.64	0.63
	E					-	-0.65
	F						-
2. Barshi	A	-	0.04	-0.34	-0.80	0.59	-0.01
	B		-	-0.46	-0.47	0.62	0.47

	C			-	0.34	-0.31	-0.49
	D				-	-0.88	0.08
	E					-	-0.02
	F						-
3. Akkalkot	A	-	0.10	0.02	-0.51	0.63	-0.29
	B		-	-0.66	-0.77	0.52	-0.34
	C			-	0.57	-0.43	0.47
	D				-	-0.59	0.44
	E					-	-0.45
	F						-
4. South Solapur	A	-	-0.41	0.02	0.29	-0.49	0.63
	B		-	-0.56	-0.73	0.73	-0.57
	C			-	0.51	-0.59	0.14
	D				-	-0.69	0.64
	E					-	-0.59
	F						-
5. Mohol	A	-	-0.50	0.17	0.32	0.23	0.11
	B		-	-0.65	-0.88	0.43	0.27
	C			-	0.72	-0.49	-0.62
	D				-	-0.68	-0.52
	E					-	-0.04
	F						-
6. Mangalvedha	A	-	-0.59	-0.15	0.58	-0.10	-0.50
	B		-	-0.44	-0.95	0.70	0.02
	C			-	0.53	-0.65	0.86
	D				-	-0.79	0.09
	E					-	-0.33
	F						-
7. Pandharpur	A	-	0.61	-0.44	-0.50	-0.70	0.57
	B		-	-0.84	-0.93	-0.73	0.76
	C			-	0.70	0.41	-0.75
	D				-	0.73	-0.60
	E					-	-0.45
	F						-
8. Sangola	A	-	0.28	0.67	-0.57	0.26	0.21
	B		-	-0.08	-0.66	0.05	0.52
	C			-	0.07	-0.01	-0.30
	D				-	-0.58	-0.86
	E					-	0.76
	F						-
9. Malshiras	A	-	-0.62	0.26	0.51	-0.57	-0.10
	B		-	-0.79	-0.93	0.93	0.28
	C			-	0.89	-0.83	-0.31
	D				-	-0.93	-0.16
	E					-	0.38
	F						-
10. Karmala	A	-	-0.04	0.29	0.01	0.34	-0.51
	B		-	-0.76	-0.77	0.43	-0.68
	C			-	0.87	-0.45	0.50
	D				-	-0.67	0.76
	E					-	-0.64
	F						-
11. Madha	A	-	0.68	-0.46	-0.17	-0.45	-0.28
	B		-	-0.39	0.08	-0.67	-0.61
	C			-	0.10	0.49	0.03
	D				-	-0.03	0.25
	E					-	0.34
	F						-

Source: Compiled by Researcher on the basis of Socio Economic Review and District Statistical Abstract of Solapur District 1975-76 to 1999-00

[http://interactionsforum.com/neo\\_geographia](http://interactionsforum.com/neo_geographia)

### 3. Transformation of Area under Oilseeds and Fiber into Sugarcane:

During the period of investigation, considering the district as whole, sugarcane has high negative correlation with, fiber, however at tehshil level it differs as per category and tehshil.

I. The table 1B reveals that sugarcane has high negative correlation with oilseeds only in Pandharpur tehshil, which is amounted by -0.75 co-efficient of correlation, which indicates that area under Oilseeds has been transferred into area under sugarcane in Pandharpur because of increase in perennial irrigation facility.

II. High negative correlation between sugarcane and fiber is found in the Malshiras tehshil, which is amounted by -0.83 co-efficient of correlation. During the period of investigation the area under fiber crops decreased, which is transferred in area under the Sugarcane.

### 4. Transformation of Area under fiber and oilseeds into Fruit-vegetable:

During the period of investigation, considering the district as whole, fruits-vegetable have high negative correlation with, fiber crops.

I. The high negative correlation between fruit-vegetable and oilseeds is found only in Sangola tehshil, which is amounted by -0.86 co-efficient of correlation, during the period of investigation. In Sangola tehshil the area under Oilseeds decreased considerably, which is converted into

area under fruit-vegetable due to most suitable climate for Fruit cultivation and development of technological factors such as drip irrigation.

II. Fruits and vegetable have high negative correlation with fiber crops in Barshi, South Solapur, Mohol, Mangalvedha, Malshiras and Karmala tehshils. which is amounted by -0.67 to -0.93 co-efficient of correlation. The area under Fruit-vegetable is increased in these tehshils, which was earlier under fiber crops. This transformation is mainly due to favorable climate for fruits cultivation, development of technological factors and higher income from fruits-vegetables.

### 5. Transformation of Area under fiber into oilseeds:

The table 1B indicates that the district as whole has high negative correlation between fiber and oilseeds. But, tehshil level analysis reveals that the rate of negative correlation varies from tehshil to tehshjl. The high negative correlation between fiber and oilseeds is found only in South Solapur tehshil, which is amounted by -0.65 co-efficient of correlation, which indicates that area under fiber crops is converted into area under oilseeds in South Solapur tehshil.

### Conclusions:

The forgoing analysis reveals that district as a whole have high negative correlation between cereals and oil-seeds, between pulses and sugarcane, between pulses and fruit-



vegetables, between fruit-vegetables and fiber. This indicates that area under cereals and pulses are transferred into cash crops such as sugarcane, fruits and vegetable. This transformation is mainly due to the development of surface irrigation facilities because of construction Ujani major irrigation project and use of innovations in agriculture.

The conversion of most of area under cereals into area under fruit and vegetable in Barshi tehsil is result of increase in surface irrigated area because of medium irrigation project. The high negative correlation between pulses and sugarcane in Mohol, Pandharpur, Malshiras and Karmala tehsils indicates that with the availability surface irrigation, the farmers of these tehsil have brought

their cultivated area under sugarcane which was earlier under pulses crops.

The high negative correlation between Pulses and fruit-vegetable and decrease in area under pulses in the tehsils of North Solapur, Akkalkot, South Solapur, Mohol, Mangalvedha, Pandharpur, Sangola, Malshiras and Karmala reveals that the farmers of these tehsil converted their cultivated land into fruit and vegetable, which was earlier under pulses mainly due to suitable climate for fruit-vegetable, development of technological factors and high income from fruit- vegetable. The transformation of cultivated area from oilseeds to sugarcane in pandharpur tehsil is result of development of perennial irrigation facility, due to Ujani irrigation project.

#### References:

1. Jain C. K. (1992): “Transformation of Agriculture in Tribal Madhya Pradesh, New Dimensions in Agricultural Geography, Volume 5, Concept publishing Company, New Delhi 110059 Pp.209.
2. Pal Indra and Shukla Lakshmi (1992): “Changing Agriculture in the Hilly Tractsof Rajasthan”, New Dimensions in Agricultural Geography, Volume 5, Concept publishing Company, New Delhi 110059 Pp.177.
3. Singh Surender (1992): “Dynamics of cropping Pattern in Northern India” New Dimensions in Agricultural Geography, Volume 5, Concept publishing Company, New Delhi 110059 Pp.113.
4. Vaidya B. C. and Nannaware (2013): “Assessment of Land Use / Land cover Dynamics in Parner Tehshil by using Remote sensing Technique”, International Geographical Journal, The Deccan Geographer, Volume 51, Number 1&2, Pp 109.