Regional Disparities in Levels of Agricultural Development in Dhule and Nandurbar Districts, India

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Abstract

The Regional approach plays a vital role in the analysis of regional disparities in farming practices and for interpretation of the changing pattern of agricultural regions. A widely accepted definition of region is an area that is differentiated from other areas according to the specified criteria. In the process of agricultural development various variables has play major role. Agricultural region is a device for identification of weaker and prosperous zones of agriculture development. Shahada tahsil has reveal higher level of agricultural development carrying composite index of development about 157.95 followed by Taloda and Shirpur while poorer level of development shown in Shindkheda tahsil. The principal objective of this paper is to determine the levels of agricultural development at tahsil stage during the period of triennial 2001-2003.

Keywords: Region, variables, disparity, composite index, levels, correlation matrix.

Introduction

In the context of agricultural pattern; regions on earth surface reflect weaker and prosperous zones of agriculture. Region means a large indefinite location on the surface of the earth. A region may be defined as a part of planet's surface having certain characteristics which enable it to be recognised as a unit, distinguishable from other units which surround it, and which may themselves be identified by similar or different characteristic features. A region may be defined in physical terms, e.g. a tropical volcanic plateau, a river valley; in climatic terms, e.g. a tropical monsoon region by economic and social criteria, such as a textile-manufacturing region, or a nomadic herding region[1]. A widely accepted definition of region is an area that is differentiated from other areas according to the specified criteria. The regional approach is fundamental in the study of agricultural geography. Whittlesy[2] (1954) is the first geographer who studied the patterns of agriculture of the whole world. Hartshorne[2] (1959), Bunge[2] (1962), Grigg[2] (1965) and Symons[2] (1967) had stated the importance to study of regions. Agricultural regions must be define in terms of agricultural elements that is by crop, livestock or enterprise data or by measurement of farming process or of farming organization of areas of dominance by particular enterprise, association of enterprise or farming types, to the recognition of such areas as distinctive region.[2] Geographers identify regions based on characteristics of landform features; it is an uninterrupted area having some kind of homogeneity with specifically defined outer limit. The development of any region may be assessed by several ways. One of the approaches might be to assess the annual rate of growth of national income in relation to growth rates of other economies[3]. Sharma[4] has selected seventeen indicators and grouped them into three classes is as follows i. Agricultural Resources Base such as rainfall, soil, fertility, per

capita net area sown, percentage irrigated area, double cropped area, area under cash crops, ii. Adoption of New Technology such as high yielding varieties, fertilizer, plant protection equipment, tractors and tractor operated equipment's iii. Agricultural Infrastructure such as credit societies, communication, marketing, storage capacity, rural electrification and social setting[1]. Waliullah Khan[5] has considered twelve variables with respect to technological determinate for assessment of agricultural development. Pawar C.T has considered ten variables for assessment[6].

Objectives: The principal objective of this research paper is to determine the levels of agricultural development and thereby knowing the weaker and prosperous patches in the study region.

Methodology

The research paper is based on primary and secondary data which has obtained from the Socio-economic abstract, government publications and field work. Investigation is carried out for the periods of 2001-03. Selected variables are chosen for investigation and for avoiding seasonal fluctuation triennial average has calculated for 2001-2003. The basic unit for investigation is tahsil and district as a whole. The collected data is processed with the help of statistical methods. In this study have includes different indicators for analysing the levels of agricultural development. In order to determine levels of agricultural development following variables are considered.

X_1 -% of net irrigated area to gross cropped area. X_2 -% of diesel and electric engines to gross cropped area. X_3 -% of area sown more than once to gross cropped area. X_4 -% of tractors to gross cropped area. X_5 -% of tractor operated implements to gross cropped area. X_6 -% of ploughs to gross cropped area. X_7 -% of plant protection equipment's to gross cropped area. X_8 -

% of area under HYV seeds to gross cropped area. X9 -% of fertilizer application in tons to gross cropped area. X10-% of rural literacy to gross cropped area.

In order to determine agricultural development above considered variables has calculated by using following equation.

$$CDi = \frac{Pi}{PI}$$

Where, CDi = the coefficient of development for variable 'i', Pi = percentage of variable 'i', PI = mean percentage of variable 'i' in the whole region

$$CID = \frac{CDi_1 + CDi_2 + CDi_3 + \cdots + CDi_n}{N}$$

Where, CID = Composite index of development. N = Number of Variable

Study area: Dhule and Nandurbar district of Maharashtra state in India lies between 20^0 38' to $22^003'$ N and $73^047'$ to 75^011 'E, spreading over an area of 13,150 sq. Km, which is 4.3% to the state of Maharashtra. For administrative purpose Dhule and Nandurbar district comprise ten tahsil namely Sakri, Shindkheda, Shirpur, Nandurbar, Nawapur, Taloda, Shahada, Akkalkuwa and Akrani. For the fast development of tribal patches bifurcate of Dhule district and then separated Nandurbar as district with five tahsil in July 1997. The relief of the region has been grouped into four zones based on the basis of regional characteristics. The Satpura region, the Tapi valley, the Region of dykes and residual hills, the Sahara scarps. Tapi is the main river traversing through the central part of the study area. Tapi is the main river traversing through the central part of this region within the study area.
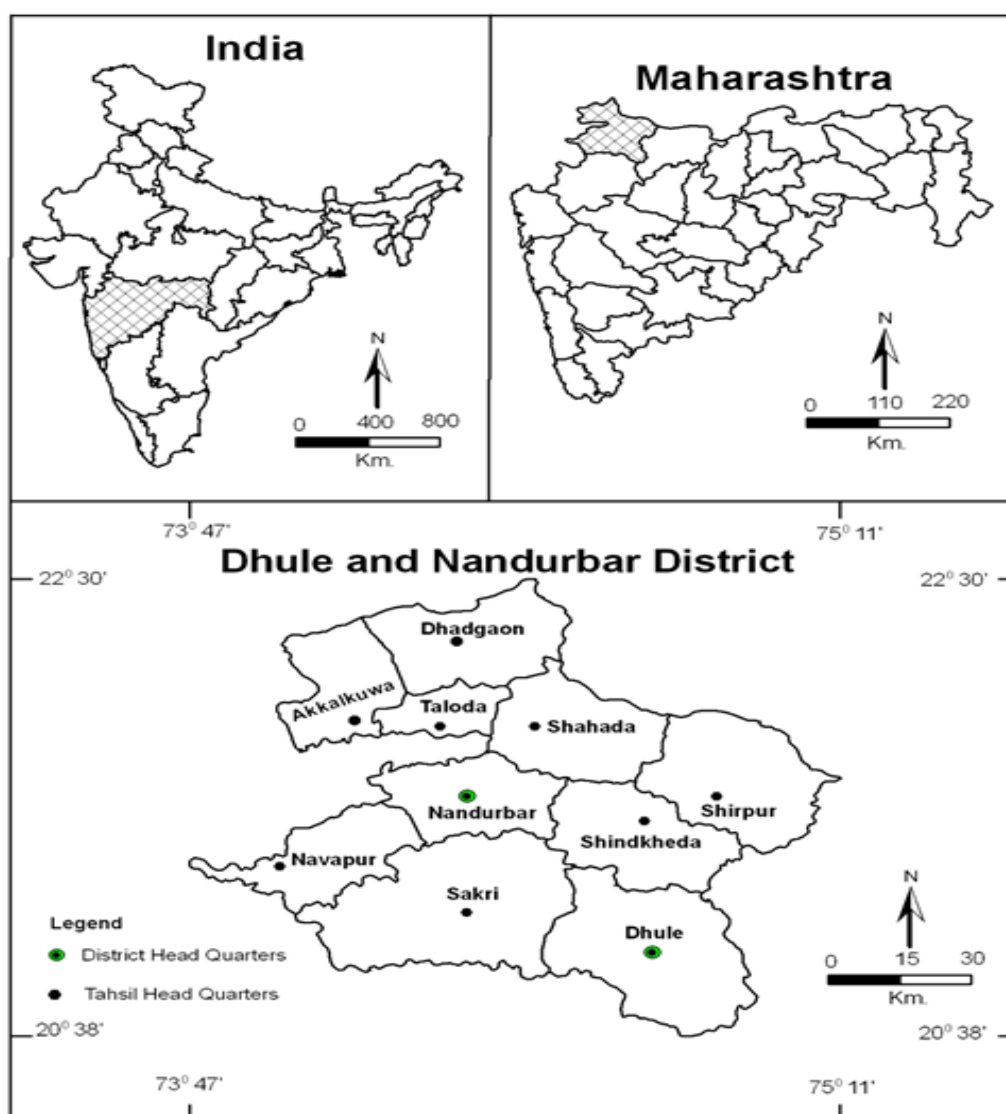

Figure-1
Location map of study area

The Tapi and its tributaries may be broadly divided into three group's namely northern tributaries, southern tributaries, the other southern tributaries. The highest temperature goes up to 45°c in summer whereas minimum temperature is observed up to16°C in winter season. The average annual rainfall of the study area is 780 mm. The soils of this region is deep fertile soil to coarse shallow to stony soils away from the river either northwards towards the Satpura or southwards towards the residual hills and dykes. As per the census of 2001, total population of the region was 30, 19,656 and as per 2011 were 3019656 people lives in this region.

Results and Discussion

After calculating CID for all tahsils following results were obtained. For sake of interpretation value of index grouped into three categories.

High Level of Development: Above 150 composite index of development has occurred only in Shahada. In this tahsil farming is generally carried out with commercial attitude and by adopting new form technology it helps for the development of agriculture. Also has an irrigation facility such as canal irrigation, well irrigation and tube well irrigation. Thereby large area falls under irrigation. This high development is due to high

fertility of deep black soils, intensive cultivation and assured water supply. Agro based industries working in this tahsils.

Table-1
Composite Index of Development and levels of Development

Tahsil	CID (%)	Level of Development	Tahsil
Dhule	111.59	Higher Level of Development	(1) Shahada
Sakri	82.41		
Navapur	66.78	Moderately High Level of Development	(1) Taloda
Nandurbar	92.57		(2) Shirpur
Taloda	134.81		(3) Dhule
Akkalkuwa	54.83	Lower Level of Development	(1) Sakri
Akrani	85.98		(2) Nandurbar
Shahada	157.95		(3) Akrani
Shirpur	116.25		(4) Shindkheda
Shindkheda	96.73		(5) Nawapur
			(6) Akkalkuwa

Source: Computed by Researcher.

Moderate level of Development: Taloda, Shirpur and Dhule tahsils are fall in this category with 134.81%, 116.25% and 111.59% composite index of development respectively. Shirpur tahsil has less area in terms of net sown area but rich by underground water and canal irrigation.
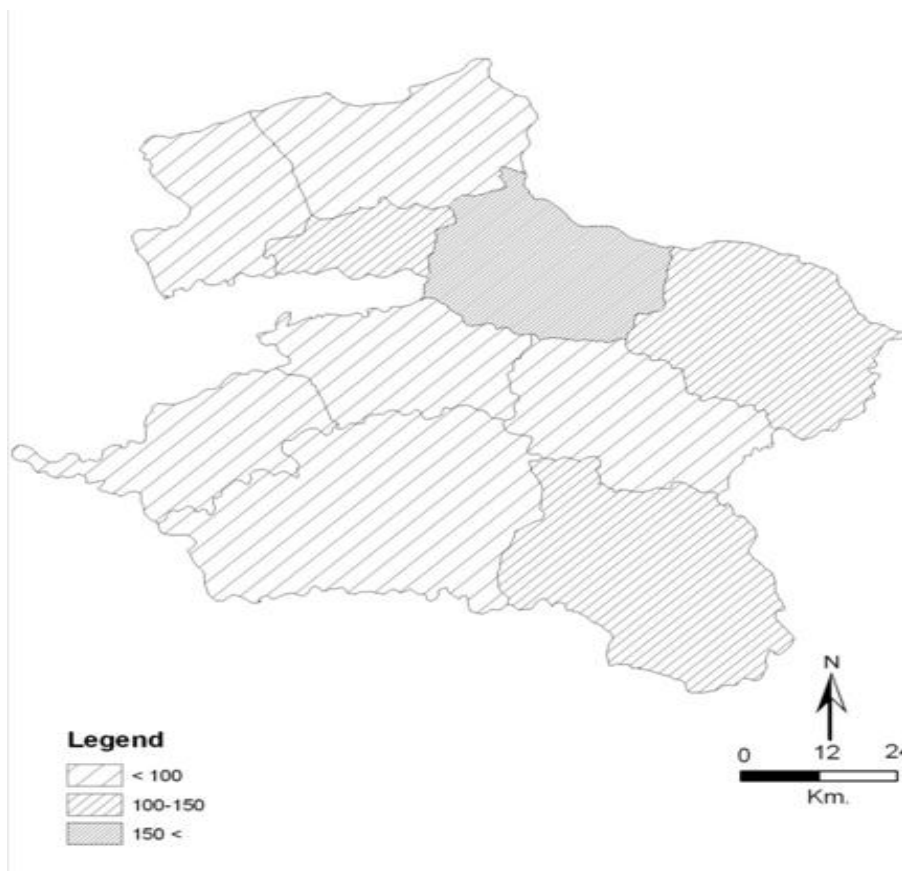
Figure-2
Tahsil wise levels of agricultural development

Dhule is the district place and has few pockets were the agricultural development took place.

Low level of development: In this category, six tahsil has been reported namely Nandurbar (92.57), Akrani (85.98), Sakri (82.41) Nawapur (66.78) and Akkalkuwa (54.83) tahsil. It is happened due rugged topography, less irrigation facilities, coarse soil and less use of new form technology and use of fertilizers. In theses tahsil have poorer irrigation facilities thereby requirements of other inputs in agricultural practices were less. In future these tahsil may attain faster development when water made available by on-going irrigation projects.

Discussion: After Calculated composite index of ten tahsil out of which Taloda, Shahada, Shirpur and Dhule tahsil has shown progress in agriculture were few effective factors play major role in the development such as deep black soils, intensive cultivation and assured water supply and sugar and textile factory. Sakri, Nandurbar, Navapur, Akrani, Shindkheda and Akkalkuwa have shown slower growth of agricultural development. It is due to use of agricultural implements are poor.

Conclusion

It is observed after calculating correlation of variables near about 1/3 variables has negative relationship with each other.

Net irrigated area has negative correlation with the electric and diesel engine pump, plant protection equipment and area under high yielding seeds and rural literacy. However, net irrigated area has positive correlation with area sown more than once, tractor and tractor operated implements, plough and application of fertilizer. Also high correlation shows between tractors with tractor operated implements. In this study region net irrigated area, tractor, tractor operated implements, plough and fertilizer might be play a key role in the development of agriculture during investigated period.

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Table-2
Matrix of Correlation

Variables	X1	X2	X3	X4	X5	X6	X7	X8	X9	X10
X1	1									
X2	-0.25	1								
X3	0.57	0.07	1							
X4	0.79	0.007	0.50	1						
X5	0.81	0.01	0.48	0.98	1					
X6	0.45	-0.00	0.50	0.53	0.60	1				
X7	-0.23	-0.35	-0.28	-0.30	-0.28	0.35	1			
X8	-0.75	0.07	-0.70	-0.63	-0.62	-0.59	-0.10	1		
X9	0.44	0.40	0.30	0.75	0.71	0.20	-0.39	-0.48	1	
X10	-0.08	0.79	0.46	0.13	0.15	0.44	-0.13	-0.17	0.32	1