

## Spatio Temporal Distribuiton of Major Agriculture crops in Dindori Tehsil of Nashik District, Maharashtra

Mr. Sachin Rahu Govardhane

VVMs, S.G.Patil Arts, Comm. & Sci. College  
Sakri, Dist- Dhule (MS)

Dr. Suresh Kautik Shelar

G.E.T.s Arts, Commerce & Science College,  
Nagaon, Dist. Dhule

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### Abstract

The selection of crop production and method of production are influenced by price instabilities in market, purchasing power and socio-economic situation, prevailing tradition, previous experience and knowledge etc. have foremost influence on farmer's decision regarding method of crop and method of production. The present study is an attempt for study of land use pattern in Dindori Tehsil. Hence the focus is on spatial dissemination of agricultural crops. The spatial distribution of agricultural crops and their temporal studied for the period from 2000-01 to 2010-11 have studied and has identified possible reasons in control for present agricultural land use pattern. The study reveals that the major crops cultivated in kharif season [June to October, November] are Bajra Onion, Total Pulses, Total Oilseed, Fodder crop, Sugarcane, fruit (Cash crops) etc In rabbi season [October to March] crops such as (Cereals) wheat, Jowar, etc and Mix Crops are (Kharif, Rabbi and Summer Seasons) e.g. Sugarcane, fruits, vegetables, flowers and fodder crops etc. are grown in the study area. In the

study area farmers have adopt partially modern technology i.e. drip irrigation facility, HYV seeds material, sugarcane, fruits, vegetables, food grain and other crops, increasing uses of composting biomass, machineries, improved plantation technology and micro irrigation systems, available for nearby village inputs (seeds, fertilizers, insecticides, cattle feeds and veterinary services), agricultural labor bullock power, crop loans, electricity, irrigation, dairy centers and processing units, nearby sugar factory, good network of transports and markets, good communication facilities, agricultural advisory centers etc. are available in the study area.

### Introduction

Agricultural land use pattern in any region depends upon socio-economic, physical and climatic conditions. Farmer's decision for crop selection and method of production are influenced by price instabilities in market, purchasing power and socio-economic situation, prevailing tradition, previous experience and knowledge etc. have foremost influence on farmer's decision regarding method of crop and method of production. The present study is an attempt for study of landuse pattern in Dindori Tehsil. Hence the focus is on spatial dissemination of agricultural crops. The spatial distribution of agricultural crops and their temporal studied for the period from 2000-01 to 2010-11 have studied and has identified possible reasons in control for present agricultural landuse pattern. The data regarding crops for the year 2000-01 have collected from Socio-economic Abstracts for District. The spatio-temporal variations in agricultural landuse pattern for Dindori tehsil has studied for two decades from 2000-01 to 2010-11.

### Objectives:

1. To study spatial patterns of major crops in Dindori Tahashil.
2. To examine Temporal changes in the area under different crops in Dindori Tahashil.

### Data Collection & Methodology :



In this present paper all the information collected from primary and secondary sources For the year 2001-2010. The primary information collected through interviews of farmers and Questioners and the secondary information often from Report Official Information (2012-13) 'Agriculture Department and Revenue Circle', Village wise Cropping information-Talathi Office, Dindori.

1. deta has been obtained from Primary and Secondary sources have been complied tabulated and analyzed using simple descriptive statistics.

2. The distribution of agriculture land under different crops has been analyzed both spatially and temporally.

#### Distribution of Principal Crops:

Distribution of irrigated land among different crops shown in table 4.1, 4.2 : kharip crops i.e. rice, bajra, Soya been, Other Oilseeds, Cotton, Sugarcane, Grapes, Jowar and maize as well as rabbi crops i.e. wheat, other cereals, Jowar and maize, pulses, sugarcane, Grapes etc. are important crops grown with the help of ground water.

The crop categories are rice, wheat, other cereals, total pulses, Oilseeds, sugarcane, total fruit, vegetable, flower and fodder crops and spices (Table 1).

Table 1: Major Crops in Dindori Tehsil

S. N.	Crops Group	Particular
1	Rice	Kharip Cereals
2	Wheat	Rabbi Cereals
3	Other Cereals	Jowar, maize etc.
4	Pulses	Tur, mug, math, gram etc.
5	Spices	Chilly, Garlic, Onion etc.
6	Oilseeds	Soybeans, Groundnuts, kardai, jawas, sunflower etc.
7	Sugarcane	Kharip/Rabbi Cash crop
8	Fruit Crops	Guava, Chikku, grapes, pomegranate, papaya, sweet lime, coconut, orange, mangoes, etc.
9	Vegetable Crops	Cabbage, cauliflower, brinjal, tomato, methi, leafy vegetable, ridge guard, coriander seeds etc.
10	Fodder & Flower Crops	Grass and Rose, Chamomile, Jasmine, Marigold, Mogra etc.

(Source: Agriculture Dept. Dindori Tehsil)

#### Village wise area of major crops:

The total actual cropped area is 99277.19 hectares during 2010-11 includes Kharip and Rabbi. Table 2 shows that Grapes and Fruits is the dominant crop in the tahasil. It is cultivated in 20544.31 hectares of land, which accounts for 20.69% of gross cropped area followed by fodder (12.87%). Whereas the Oilseeds, Vegetables, Wheat, Other Cereals, Rice, Pulses, Sugarcane, Spices crops are 12.22, 12.08, 11.84, 11.48, 7.47, 7.01, 2.27 and 2.07 % respectively. The cropping system is an important component of any farming system. It is the proportion of area under various crops at a point of time.

Table 2:

#### Temporal Distribution of Major Crops in Dindori Tehsil

S.No.	Crops	2001		2011		% of Variation from 2001 to 2011
		Total Area in hectares	Total Area in %	Total Area in hectares	Total Area in %	
1	Rice	6697.57	6.90	7416.00	7.47	-0.57
2	Fodder	14225.05	14.65	12775.98	12.87	1.78
3	Wheat	10939.90	11.27	11752.10	11.84	-0.57
4	Other Cereals	14591.25	15.03	11400.00	11.48	3.55
5	Pulses	8361.54	8.61	6960.00	7.01	1.60
6	Vegetables	7729.80	7.96	11993.62	12.08	-4.12
7	Sugarcane	1639.27	1.69	2253.04	2.27	-0.58
8	Grapes&fruits	15054.53	15.51	20544.31	20.69	-5.19
9	Oilseeds	14466.54	14.90	12130.00	12.22	2.68
10	Spices	3376.14	3.48	2052.14	2.07	1.41
	Total	97081.74	100.00	99277.19	100.00	0.00

The cropping pattern undergoes changes in response to the changing physical and cultural environment. For an appreciation of temporal variations in study area twenty years have been taken into account and study was made with considering a real strength of individual crop.



Table 2 displays the temporal variations in cropping pattern in the study area of Dindori tehsil from 2001-2002 to 2011-12.

#### Village wise Cropping Data (Kharip and Rabbi):

Detailed village wise cropping pattern in the study area (Total-157 villages), during 2000-01 to 2010-11 is discussed as under.

##### 1. Rice (*Oryza Sativa*):

Rice is a staple food of the country produced in the areas where annual rainfall exceeds 100 cm. The figure 1 represents rice distribution in study region. During 2001 out of 157 villages the highest production of rice principally found in the Nanashi, Takanchapada (N.V.), Savarpathali (N.V.), Deothan, Ahiwantwadi, Kochargaon, Bhanwad, Palasvihir, Dhondalpada, Dehare villages. Out of total net sown area of these villages they produce 25.43, 24.75, 23.81, 21.33, 19.89, 19.23, 19.07, 18.83, 18.81, and 18.78 percent of rice production respectively. Most of rice production is found in the Nanashi circle (32.17 percent) and Umrade circle (29.12%) because of suitable require condition available in utmost of area (figure 2).

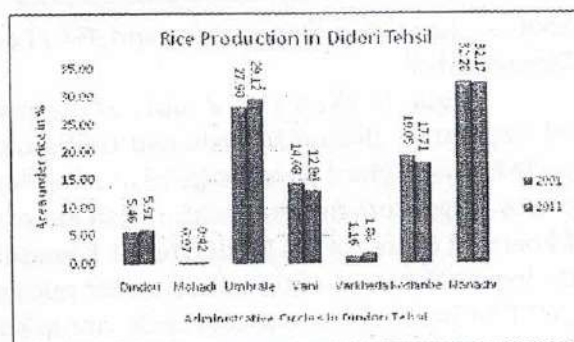


Figure 1: the Chart shows the circle wise distribution of rice crop in Dindori tehsil during 2000-01 to 2010-11

##### 2 Fodder Crop

Fodder crops are grown in the study region in together (kharip and rabbi) seasons and were used as food crop for the animals like castles, goats, sheep, horses, chickens etc. Fodder cultivation is taking place on all types of

soil. The area under fodder crop in the study area is about 14225.05 hectors during the year of 2000-01 the area is decrease in year of 12775.98. The area under fodder crop highest in the Umbarale circle i.e 38.08 and 39.27 percent during year of 2000-01 and 2010-11 respectively (Table 3). While Mohadi circle having very less Percent of crop in the tehsil among all other circle.

Table 3:

Spatial Distribution of Fodder Crop  
(2001 to 2011)

Circle	Years. (Area in %)		Volume Change %
	2001	2011	
Dindori	19.83	20.17	0.34
Mohadi	2.59	2.45	-0.14
Umrade	38.08	39.27	1.19
Vani	4.24	3.55	-0.69
Varkheda	4.52	4.18	-0.33
Koshinbe	9.77	9.06	-0.71
Nanashi	20.98	21.32	0.34

Source: Agriculture Dept. & Tehsil of Dindori Tehsil

##### 3. Wheat (*Triticum dicoccum*):

Out of major ten crops wheat is ranking fifth in the study area, Nanashi Circle having highest percentage the area under wheat crop among all circle in the Dindori tehsil (21.30 and 21.44) on both years. The trend of increase in percent of the wheat is highest in Umrade circle (1.48) while highest negative change identified in the Vani circle (-1.68) (Table 4).

During the year 2000-01 the highest area under wheat is mainly found in Pimpalgaon Dhum (52.49), Jaulakedindori (33.58), Shivanai (30.96), Manori (25.11), Jirwade (25.03), Pandane (23.46), Talyachapada (21.92), Goldari (20.67), Khatwad (20.65) and Titave (20.46). This pattern change in during 2010-11 the highest percentage of under the wheat crop is identified in Pimpalgaon Dhum, Akrale, Jaulakedindori, Krishnagaon, Shivanai, Manori, Titave, Khatwad, Vagrud and Lakhamapur villages which having 54.66, 34.20, 31.60, 30.41, 28.13, 26.04, 24.18,



24.06, 22.22 and 20.53 percent of area under cultivation of wheat respectively.

**Table 4:**  
**Spatial Distribution of Wheat Crop**  
**(2001 to 2011)**

Circle	Years (Area in %)		Volume Change %
	2001	2011	
Dindori	19.83	20.17	0.34
Mohadi	2.59	2.45	-0.14
Umbrale	38.08	39.27	1.19
Vani	4.24	3.55	-0.69
Varkheda	4.52	4.18	-0.33
Koshinbe	9.77	9.06	-0.71
Nanashi	20.98	21.32	0.34

Source: Agriculture-Dept. & Tehsil of Dindori Tehsil

#### 4. Other Cereals (Jowar and Maize)

Jowar (Sorghum) and Maize are the other cereal crops in the study region. These principal crop and provides food for human as well as fodder for livestock in all seasons i.e. kharip and rabbi. In the study area, other cereals were cultivation, all the sources of irrigation and fertilizers are used in maximum proportion. The area under cultivation of other cereals crops were 15.03 percent in Dindori tehsil during 2000-01 this area reduces upto 11.48% in 2010-11.

**Table 5:**  
**Spatial Distribution of Other Cereals Crops**  
**(2001 to 2011)**

Circle	Years (Area in %)		Volume Change %
	2001	2011	
Dindori	8.09	7.55	-0.54
Mohadi	5.95	5.73	-0.22
Umbrale	20.07	20.12	0.06
Vani	13.57	12.43	-1.14
Varkheda	12.17	11.28	-0.89
Koshinbe	13.92	13.11	-0.81
Nanashi	26.24	29.78	3.54

Source : Agriculture Department and Tehsil of Dindori Tehsil

The largest cultivation of other cereals were mainly found in Nanashi Circle with

increasing trend. The area under other cereal were increase from 26.24 to 29.78 from 2000-01 to 2010-11. The Mohadi Circle having least area under other cereals among all circle (Table 5). The major cause is nearness of city area of Nashik. As we as area far from Nashik the area under cereal also decrease.

#### 5. Pulses

The pulses deserve the spatial attention on the food cultivations in the study region. It is generally mix crop cultivation. Pulses are kharip as well as rabbi crop and the chief pulses grown in the study area e.g gram, tur and mug while math, chavali, vatana, udid and val are also grown on a small scale. Because of economic less beneficial the area under pulses crop is less and showing decreasing trends within tehsil except Nanashi Circle.

**Table 6:**  
**Spatial Distribution of Total Pulses Crops**  
**(2001 to 2011)**

Circle	Years (Area in %)		Volume Change %
	2001	2011	
Dindori	9.00	9.01	0.01
Mohadi	7.80	7.45	-0.35
Umbrale	20.46	20.69	0.23
Vani	14.74	13.60	-1.14
Varkheda	11.34	10.49	-0.85
Koshinbe	14.13	13.68	-0.44
Nanashi	22.53	25.08	2.55

Source : Agriculture Department and Tehsil of Dindori Tehsil

Table 6 shows the out of seven administrative division Nanashi and Umbrale circle having highest percentage of area under pulses crops. Both the circle accomplish almost 45 percent of area of the Dindori tehsil. Nanashi During 2000-01 out of total area under pulses (8361.54 hectares) the Nanashi circle occupied 22.53 percent of area this area increase upto one-fourth during 2010-11. Except nanashi and Umbrale circle all circles shows negative



change in volume of the pulses. Mohadi Circle having lowest percentage of the area under pulses. The villages Janori, Dhakambe, Shivanai, Varvandi and Ambedindori in mohadi circle having less than five percent of area under pulses crop. The major cause is economic benefit is less and also topographic and climatic favorable situation.

## 6. Vegetables

The vegetable cultivated in the study area were short duration, i.e. 90 days to 120 days or 3 to 4 months, that's why the intensive cropping is more popular. A variety of vegetable like potato, sweet potato, peas, bitter and bottle guard, cucumber, tomato, okra (lady fingers), cabbage, onion, chilly, brinjal, cauliflower, vetch, radish, pea, lufa etc. are grown on small as well as large patches of land in the study area. Vegetables are cultivated on a smaller scale as compared to rice, cereal crops and cash crops. These vegetables are irrigated using lift, canal, well, tube well, reservoirs and river water, with the marginal support from groundwater.

Recently under National Horticulture Mission, vegetable growers are encouraged to cultivate vegetables in shade net houses. These shade net houses are erected in groups to save the initial cost of erection and cultivation. The technical training and consultancy given by horticultural training at Mahatma Phule Krishi Vidyapeeth (MPKV) Rahuri, Ahmednagar and PIRENCE Research Center (Babhaleshwar) Rahata, Ahmednagar, Pune, Nashik, Aurangabad and others Centers. This is an opportunity for small farmers for adopting high value crops and to utilize the available land and water resources efficiently for quality production. Agreement for marketing with retail markets and related discussions are at progressive stage.

Onion is one of the major vegetable crops cultivated in the study area. It is the only vegetable crop having maximum area under cultivation in kharip as well as in rabbi season. Second major vegetable crop grown in the

tahasil is tomato. It is cultivated in almost various villages of the study area

The distribution pattern of vegetable crop cultivation in study region is influenced by soil, climate, irrigation, transportation, market centers and credit facilities available to farmers.

Table 7: Spatial Distribution of Vegetables Crops (2001 to 2011)

Circle	Years (Area in %)		Volume Change %
	2001	2011	
Dindori	21.47	18.08	-3.39
Mohadi	19.11	16.55	-2.56
Umbrale	12.89	15.19	2.30
Vani	11.78	14.74	2.96
Varkheda	20.37	16.82	-3.54
Koshinbe	7.76	10.22	2.46
Nanashi	6.62	8.40	1.78

Source : Agriculture Department and Tehsil of Dindori Tehsil

The area under vegetable increase from 2000-01 (7729.90) to 2010-11 (11993.62). The eastern part of tehsil especially Dondori, Mohadi and Varkheda having highest yield area under the vegetable crops with decreasing trend from 2000-01 to 2010-11.

## 7. Sugarcane

Sugarcane i.e. *Sacharum Officinarum* L. is the most irrigated cash crop cultivated in major dams area like Kadava Dam command area of Dindori tehsil. Although it is an annual crop (unlike seasonal crops like rice, wheat, vegetables etc.). It has the high density of crop during the rabbi season. 'Suru', 'Adsali', pre-seasonal and ratoon are the types of sugarcane grown in Dindori tehsil. The cultivation of sugarcane in Dindori tehsil were very less. Only dams area where water availability for irrigation was useful for the production of sugarcane. From



2000-01 (1639.27) to 2010-11 (2253.04) area where increase only one percent.

**Table 8: Spatial Distribution of Sugarcane Crops (2001 to 2011)**

Circle	Years (Area in %)		Volume Change %
	2001	2011	
Dindori	22.17	7.94	-14.24
Mohadi	3.31	13.23	9.91
Umbrale	0.87	6.77	5.89
Vani	33.03	2.72	-30.31
Varkheda	25.54	30.80	5.26
Koshinbe	6.45	26.84	20.40
Nanashi	6.62	11.71	5.09

Source: Agriculture Dept. & Tehsil of Dindori Tehsil  
**8 Grapes and Fruit**

Nasik District is worldwide famous in the production of grapes. Hence, Dindori tehsil also having wide area under the cultivation of grapes and fruits. After grapes other major fruits crop grown in the study area are Guava, Chikku, pomegranate, papaya, sweet lime, coconut, orange, santra, banana, fig (anjir), mangoes, custard apple etc. are having huge quantity. Therefore the fruits crops covers highest percentage of area within tehsil.

The area under fruits and grapes having increasing trend from 2000-01 to 2010-11. The area is increase from 15054.58 (15.51) and 20544.31 (20.69) hectares from the both years.

**Table 9: Spatial Distribution of Grapes and Fruits Crops (2001 to 2011)**

Circle	Years (Area in %)		Volume Change %
	2001	2011	
Dindori	11.63	11.40	-0.23
Mohadi	22.23	20.39	-1.84
Umbrale	8.14	9.87	1.73
Vani	10.64	12.10	1.46
Varkheda	27.70	24.87	-2.83
Koshinbe	13.78	14.91	1.12
Nanashi	5.88	6.47	0.60

Source: Agriculture Dept. & Tehsil of Dindori Tehsil

Table 9 shows area under fruits and

grapes during 2000-01 fifty percent of fruits area having only two major circle i.e Mohadi and Varkheda. But during 2010-11 the areas of Mohadi and Varkheda significantly decrease up to five percent while in Umbarale Vani and Koshimbe Circle shows increasing trend within tehsil.

During 2001 villages Palkhed (55.18), Sonjamb (46.93), Mohadi (44.32), Ambedindori (43.59), Gondegaon (43.16) and Shindpada (40.17) having more than 40 percent of area under fruits and grapes because of more economical beneficial as well as suitable condition availability. In 2011 villages like Palkhed (66.68), Shindpada (58.39), Mohadi (55.74), Korhate (52.08), Sonjamb (51.97), Gondegaon (50.22), Pimpalgaon Ketaki (48.83), Materewadi (47.86), Pingalwadi (45.39), Valkhed (43.92), Chinchkhed (43.40), Ambedindori (42.58), Khadak Sukene (42.22), Bopegaon (40.63) and Mavadi (40.13) having more than 40 percent of grapes and fruits production. Karanjali, Palasvihar, Borvand (N.V.), Chelharpada (N.V.), Dehare, Gandole, Ambad, Chikadi (N.V.), Mokhnal and Tetmala (N.V.) villages and Dehare, Gandole, Tetmala (N.V.), Chikadi (N.V.), Chelharpada (N.V.), Palasvihar villages in Nanashi circle having no cultivation of fruits crops because of uneven topography and less suitable condition prevail there.

#### 9 Total Oilseeds

The oilseed crops grown in both kharip as well as in rabbi season. The chief oilseeds grown in the study area are groundnut and soyabean while kardai, jawas, sunflower etc. also grown on a small scale. Oilseed crops were occupied third largest cultivated area of the Dindori tehsil. During 2000-01 and 2010-11 area under total oilseeds were 14466.54 (14.90) and 12130.00 (12.22) correspondingly.

**Table 10:**

**Spatial Distribution of Total Oilseeds Crops (2001 to 2011)**

Source: Agriculture Dept. & Tehsil of Dindori Tehsil



Circle	Years (Area in %)		Volume Change %
	2001	2011	
Dindori	13.28	12.89	-0.40
Mohadi	9.51	8.71	-0.80
Umbrale	19.26	18.22	-1.04
Vani	13.00	14.02	1.02
Varkheda	15.93	15.79	-0.14
Koshinbe	13.80	14.16	0.36
Nanashi	15.21	16.22	1.00

Table 4.10 shows that oilseed were equally consistent in all circle of the tehsil. The averagely fifteen percent of area of all circle having oilseed production. Except Mohadi (9.51 and 8.71) and Umbarale (19.26 and 18.22) circle. The crop is economically as well as domestic purpose more important hence production of oilseed is equally distributed in all part of the tehsil. The net sown area under oilseed in relatively decrease from 2000-01 to 2010-11 because of increase in percentage of cash crops like grapes and fruits.

#### 10 Total Spices

The crops like chilli, jeera, termuric, garlic etc. were includes in spices. The spices are cultivated for the domestic as well as instant money purpose. The cultivated area of spices is decreases from 2000-01 to 2010-11. The area of these period were 3376.14 (3.48) and 2052.14 (2.07) hectares respectively.

**Table 4.11: Spatial Distribution of Total Oilseeds Crops (2001 to 2011)**

Cirde	Years (Area in %)		Volume Change %
	2001	2011	
Dindori	9.79	7.60	-2.19
Mohadi	18.81	10.07	-8.74
Umbrale	5.35	4.93	-0.42
Vani	17.25	24.90	7.65
Varkheda	24.06	27.81	3.75
Koshinbe	17.25	19.64	2.39
Nanashi	7.49	5.05	-2.44

Source: Agriculture Dept. & Tehsil of Dindori Tehsil

The cultivated area were significantly increases during the year of 2000-01 to 2010-11 on Vani (7.65%), Varkheda (3.75%) and Koshimbe (2.39%) circles while all other circle were shows decreasing trend. Mohadi circle having highest decrease (-8.74%) from 2000-01 to 2010-11, after Mohadi, Nanashi and very little change in Umbrale circle were recognize.

During 2000-01 villages like Jaulakevani (17.46), Shindwad (13.43), Ambedindori (12.34), Lokhandewadi (10.44), Ganorwadi Ganeshgaon (10.44), Ahiwantwadi (10.29), Koshimbe (10.11) and Akrale (10.06) having more than ten percent. Same duration the Ambad, Tetmala (N.V.), Dhondalpada, Manori and Bhoryachapada villages having none of area under spices. (Fig. 4.19) During 2010-11 only two villages having more than ten percent of area under cultivation of Jaulakevani (11.80) and Shindwad (10.93). Dehare, Gandole, Tetmala (N.V.), Chikadi (N.V.), Chelharpada (N.V.), Mokhnal, Karanjali, Mahaje, Devalipada (N.V.), Gawalwadi, Radtodi (N.V.), Dhondalpada, Ambad, Deoghar, Nanashi, Vanjole, Manori, Thepanwadi, Nalwadpada, Deopada, Kokangaon Bk., Savarpathali (N.V.), Ramshej, Takanchapada (N.V.), Pimpalnare and Korhate having zero percent of area under the spices. The trend shows the decreasing interest of farmers.

#### Summary

The major crops cultivated in kharif season [June to October, November] are Bajra Onion, Total Pulses, Total Oilseed, Fodder crop, Sugarcane, fruit (Cash crops) etc In rabbi season [October to March] crops such as (Cereals) wheat, Jowar, etc and Mix Crops are (Kharif, Rabbi and Summer Seasons) e.g. Sugarcane, All Fruits, Vegetables, Flowers and Fodder Crops etc. grown in the study area. Summer groundnut and fodder crops are grown in summer season in the area where irrigation and water is available. Sugarcane is cultivated as Adsali, Pre-seasonal and Suru with some extent.

It is observed that in study region grapes



and fruits is major crop cultivated on all possible favorable condition during the study period. Because of the cash crop with less effort and more benefit as well as increase percent area of the tehsil. It is observed from the study area that there is a greater variation in the changes regarding to land use and cropping pattern, during the study period i.e. 2001 to 2011.

In the study area farmers have adopt partially modern technology i.e. drip irrigation facility, HYV seeds material, sugarcane, fruits, vegetables, food grain and other crops, increasing uses of composting biomass, machineries, improved plantation technology and micro irrigation systems, available for nearby village inputs (seeds, fertilizers, insecticides, cattle feeds and veterinary services), agricultural labour bullock power, crop loans, electricity, irrigation, dairy centers and processing units, nearby sugar factory, good network of transports and markets, good communication facilities, agricultural advisory centers etc. are available in the study area. Therefore, recently agricultural land use and cropping pattern is positively increasing day by day in the study area.

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## A STUDY ON MIGRATION AND SOCIAL EXCLUSION OF LABOUR FROM ORISSA TO SURAT

Job Dondapati

Research Scholar (PhD)

Tilak Maharashtra Vidyapeet, PUNE.

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#### ABSTRACT

This paper seeks to answer three questions: (1) who migrates? (2) Why do people migrate? (3) Where do people migrate? There are socio economical causes as well as social exclusions that constitute the framework of this study of migration. The migration of people from Orissa to Surat city is dealt here. It is argued that social exclusion is measured by economic assets and human, cultural, social and geographical capital may explain or is correlated with the migration decision and the choice of destination. Data are taken from the Indian Living Standard Survey 2013/14. Various analysis and command models are used to examine the choice of migration. The classification models are examined for the choice of destination. The models are based on the presumption that social exclusion may explain migration and choice of destination. The indicators of social exclusion are found to provide opportunities & constraints for migration & choice of destination.

**KEY WORDS** Migration, Social Exclusion, Sociological Analysis, Classification regression.

#### INTRODUCTION

Migration is a movement. It is a process. It is an observable phenomenon for those willing to see it, and is almost always evocative when witnessed. Migration is the movement of people



## DYNAMICS OF AREA UNDER SUGARCANE IN DINDORI TEHSIL OF NASHIK DISTRICT (M.S.)

S. K. SHELAR, G.E.T.s Arts, Commerce College Nagaon  
S. R. GOVARDHANE, S.G.Patil, & College Sakri, Dist. Dhule  
[sachingoverdhane@gmail.com](mailto:sachingoverdhane@gmail.com)

**Abstract:** India is mostly Agicultured country. In India 70% people have been engaged in agriculture activities. Agriculture is the backbone of Indian economy. By using modern techniques and technology production has been increased. Dindori tehsil of nashik district is not exception for that. Production of crops continually increased in Dindori tehsil with modern techniques. In the present research paper researcher has tried to show how sugarcane area is increased considerably.

**Keywords-** Dynamics, Technology, Cultivation, Circle, Rejuvenation.

### 1. INTRODUCTION:

Sugarcane is a tropical, perennial grass that forms lateral shoots at the base to produce multiple stems, typically three to four meters (10 to 13 ft) high and about 5 cm (2 inch) in diameter. Sugarcane is a cash crop, but it is also used as livestock fodder (Rena Perez (1997). Brazil led the world in sugarcane production in 2013 with a 739,267 TMT harvest. India was the second largest producer with 341,200 TMT tons, and China the third largest producer with 125,536 TMT tons harvest (FAO). Sugarcane is cultivated in the tropics and subtropics in areas with a plentiful supply of water for a continuous period of more than six to seven months each year, either from natural rainfall or through irrigation. The crop does not tolerate severe frosts. Therefore, most of the world's sugarcane is grown between 22°N and 22°S, and some up to 33°N and 33°S (George Rolph, 1873). There is 74374 hectares cultivable area in Dindori tehsil which is 54.41 out of total geographical area of tehsil. Out of total cultivable area 6107 hectares area is under sugarcane which is 8.21 percent. Cash crops play important role in agricultural and overall development of any region because several agro-based industries depend on it.

### 2. OBJECTIVES:

The main objective of this research work to study area under sugarcane crop and changes therein in Dindori tehsil of Nashik District.

### 3. METHODOLOGY:

The present study is based on secondary data and simple comparative method has been used to analysis the data with bar diagrams using area under sugarcane crop in last decade (2001-2011).

### 4. STUDY AREA:

Dindori tehsil is part of Nashik District. Dindori town is administrative headquarter of Dindori tehsil. It belongs to Kandesh and northern Maharashtra region. This study region consist 158 villages. The region is bounded by Chandwad and Niphad tehsils on east, Nashik tehsil on south, Surgana and Kalwan on north while on the west by Peint tehsil of Nashik District. Total geograpsical area of this region is 134219 hectares. It is located between 20° 03' 25" to 20° 27' 06" North Latitude and 73° 34' 06" and 74° 00' 06" East Longitude. The Tehsil has a total area of 1342.19 sq km. Dindori tehsil has been contributed 8.64% area of the of the Nashik District.



## 5. DISCUSSION:

Sugarcane growing countries of the world are lying between the latitude 36° north and 31° south of the equator extending from tropical to sub-tropical zones. In India sugarcane is cultivated all over the country from latitude 8° north to 33° north, except cold hilly areas like Kashmir valley, Himachal Pradesh and Arunachal Pradesh. Sugarcane is important cash crop in Dindori tehsil because here found favorable climate for sugarcane cultivation. Total area under sugarcane in Dindori tehsil is 6107 in 2011. Out of that highest area under sugar cane observed in Varkhedi circle by 1881.96 hectares which 30.8 percent is out of total area under sugarcane of Dindori tehsil. Followed by Varkedi circle, Koshinbe circle has also makeable area under sugarcane by 26.84 percent (1639.12 hectares). In other circles area under sugarcane varies from 2.72 to 13.23 percent. Grape is important cash crop of this region that's why farmers took less focus on cultivation of sugarcane..

**Table No. 1 – Dindori Tehsil: Area under Sugarcane Crop (2001-2011)**

Sr. No.	Circle	Area in %		Volume Changes in %
		2001	2011	
1	Dindori	22.17	7.94	-14.23
2	Mohadi	3.31	13.23	9.92
3	Umrade	0.87	6.77	5.9
4	Vani	33.03	2.72	-30.31
5	Varkhedi	25.54	30.8	5.26
6	Koshinbe	6.45	26.84	20.39
7	Nanashi	6.62	11.71	5.09

**Source:** Tehsil Office and Tehsil Agricultural office, Dindori Tehsil.

**Table No. 1** shows remarkable changes of area under sugarcane in Dindori tehsil. In 2001 Vani Circle (33.03%) has noted high percentile area under sugarcane but that has been decrease up to 2.72 percent in 2011 because of decrease in irrigation facilities in Vani Circle and failure of Sugar factories and high demand of grapss from vine factories. In last decade highest negative changes of area under sugarcane has been observed in Vani Circle by 30.31 percent and positive changes in Koshinbe circle by 20.39 percent. In Koshinbe circle area under sugarcane increased because of failure in grapes farming due to unpredictable rainfall and hail fall in mature periods of grapes.

**Fig. No. 1**

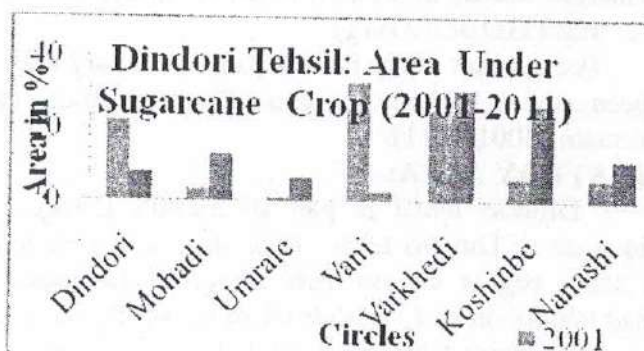


Fig No. 1 shows Changes of area under Sugarcane in last decade in Dindori circle. In Mohadi, Umrade, Varkhedi, Koshimbe and Nanashi circles have noted



possitive changes of area under sugarcane while Dindori and Vani circles have noted negative changes of area under sugarcane.

## 6. CONCLUSION:

Above discussion reveals remarkable changes of area under sugarcane. In Dindori tehsil dominance of grapes cropped area of this region. Only farmers cultivated other cash crops for rotation of crop for maintaining soil fertility naturally. That's why area under cash crops noted lofty changes even in small span of time in Dindori tehsil. In some areas has been observed extremely increased (Koshimbe circle) of area under sugarcane because of the modern irrigation techniques and tissue culture technique in sugarcane. The tissue culture technique in sugarcane can be used for rapid multiplication of newly developed high yielding, high sugar, disease resistant varieties and rejuvenation of outstanding varieties under cultivation. Sugarcane is a high water requirement crop. About 250 tones of water is needed to produce one tone of sugarcane (Source: <http://sugarcane.res.in>). Deficiency of labour force for cutting of fully grown sugarcane in last stage has been also responsible for deduction of area under sugarcane crop in some part of tehsil. So for increasing area under sugarcane and more profit there should be used modern irrigation techniques for irrigation like drip irrigation instead of flood irrigation and introduce new technology for cutting of mature sugarcane.

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## CIRCLEWISE STUDY OF CHANGES IN DINDORI TAHSIL'S FRUITS CROPS AREA

**Dr. Sachin R. Govardhane<sup>1</sup>**

*V.V.M's S.G.Patil Arts, Science & Commerce College Sakri, Tal-Sakri (Dhule) 1*

*Email Id: [sachingovardhane@gmail.com](mailto:sachingovardhane@gmail.com)<sup>1</sup>*

*Mob No: 9823969165*

**Dr. Suresh Kautik Shelar<sup>2</sup>**

*PG Department & research center of Geography Gangamai Education Trust's Arts,  
Science and Commerce College, Nagaon, Tal & Dist- Dhule<sup>2</sup>*

*Mob No: 9421901826*

### **Astract**

*India is known as agricultural country and 60% to 70% people in India engaged in agricultural activities. Agriculture is the backbone of Indian economy. Changes in agriculture practice have been seen in India since ancient time. Innovative techniques, fertilizers, pesticides, HYV seeds have made drastic changes in fruits crops and area of crops. Even in Dindori Tahsil also such changes are seen. In the present research paper researchers has tried to study the circle wise changes in fruit cropping pattern and increase in fruit production in Dindori Tahsil.*

**Key Words:** *Fruits, Food, Income Cultivation, Technology, Circle.*

### **Introduction**

Agriculture plays crucial role in developing country like India because livelihood of 65% Indian depends on the agriculture. The changes in agriculture make immediate influence on the living of the people. The sustainability and development of agriculture takes place due the Green Revolution.

Horticulture has played significant role in flourishing the fruits farm in dried zone of India. The tem Horticulture is derived from the Latin word 'Hortus'. 'Hortus' means orchard and 'culture' means cultivation. Cultivation in orchard means 'Horticulture' (Prasad & Kumar). Horticulture consist fruits, vegetables, spices, medicines, scented plants and flowers. The objectives behind practicing horticulture is to get permanent employment to the farmer, to develop well developed crop structure, to enrich livelihood of farmers, to control the soil



erosion, to maintain the balance of environment and to bring barren land under cultivation. Horticulture is helpful to provide more production than traditional farming and foreign exchange.

India has made great progress in horticulture. The production of fruits and vegetables of India is more than 71416 millions tones. India stands second in world in the production of fruits and vegetables after china. India's total share of fruits in world is 10%. (NHB-2010). Horticulture is very important from the point of view of Indian economy because it increases the production and makes available employment.

Horticulture was separated from agriculture in 1982 for its proper development. Fruit tree plantation programme was conducted under Employment Guarantee Programme in 1990-91 (Economical Survey of Maharashtra) 30 it resulted in rapid development of orchard area. Before 1990 only 2 lakhs hector land was under cultivation but today it's reached upto 15 lakhs 73 thousand out of it 9 lakhs 14 thousand hector land is productive. It is helpful to produce 25 lakhs tone fruits. Mainly, fruits like orange, grapes, cashew, bananas, mango, chikcoos and pomegranates are produced in Maharashtra. Fruit plantation under Employment Guarantee Programme has changed the condition production ratio of fruits. In the same way grapes, bananas, mango, chikcoos, guava and pomegranates fruit crops are cultivated at Dindori in Nashik district. Fruits are annual crops so it **requires** capital, labours, transportation modern irrigation system etc. Growth in fruits and fruit production is seen in study area due to capital, labours, transportation, modern irrigation system and growing population etc.

#### **Objectives:**

The main objective of this research work to study the changes of area under fruits crops to circle wise of Dindori Tehsil in Nashik District.

#### **Database & Methodology:**

The Present research work is based on secondary data and simple comparative method has been used to analysis the data with bar diagrams using area under fruits crops in last decade ( 2001-2011 ).

#### **Study Area:**

Dindori is selected as study region for the Present research work. Dindori is a Taluka in Nashik District of Maharashtra State, India. Dindori Taluka Head Quarters is Dindori town. It belongs to Khandesh and Northern Maharashtra region. This study region consists the 157 Villages. 20° 03' 25" North latitude to 20° 27' 06" North latitude and 73° 34' 06" East longitude to 74° 00' 06" East longitudes. The total Geographical Area (TGA) of the Tehsil is about 1342.19 square km. It is about 08.64 percent of TGA of Nashik District. The major source of income is the agriculture. Agriculture is the major economic activity and hence the agricultural resources should be evaluated, therefore, one reason for selection this research..



**Analysis of the topic:**

Dindori Tahsil is famous for the fruit crops cultivation like bananas, mango, chickoos, guava, apple berry, strawberry, papaya, watermelon and pomegranates. In the present study urbanization, people's ability of buying fruits the importance of fruits from the point of view of health has been observed in western and northern traffic routes.

The total fruit production area in Dindori Tahsil was 20544.31 hector during the year 2010-2011 and during the year 2001 it was 15054.58 hector. It shows growth during the year 2010-2011. The maximum fruit production is seen in the circles like Umarale, Vani, and Koshimbe Nanashe etc. The basic reasons behind this growth are urbanization, people's ability of buying fruits, transportation, market etc. the maximum fruit production area is seen in Koshimbe circle. It was 14.91% means 3069.15hectars during the 2011. After this Umarale, Vani, Nanashe number comes 9.87, 12.10 and 6.47 respectively. In the rest of the circles' there is dominance of crops like vegetables, sugarcane flowers is seen due to excessive expenses.

**Table No. 1 Dindori Tehsil Area under Fruits Crops (2001 to 2011)**

Circle	Years (Area in %)		Volume Change %
	2001	2011	
Dindori	11.63	11.40	-0.23
Mohadi	22.23	20.39	-1.84
Umbrale	8.14	9.87	1.73
Vani	10.64	12.10	1.46
Varkheda	27.70	24.87	-2.83
Koshinbe	13.78	14.91	1.12
Nanashi	5.88	6.47	0.60

Source: Tehsil Office & Tehsil Agriculture Office of Dindori Tehsil

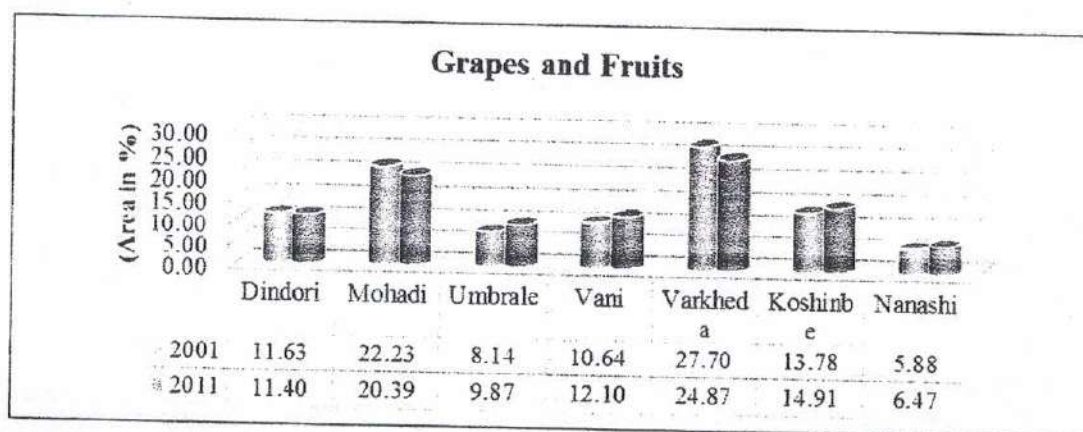
**Table. No.1**

In the above mentioned table change has been observed in fruit producing area. Varkheda circle area was 27.70% was the largest fruit producing area during the year 2001 but in during the year 2011 it was 24.87%. The reason behind it many farmers were turned towards crops like sugarcane, and vegetables. Not only Varkheda circle but also in the circles like Mohadi and Dindori reduction is seen. Fruit producing area is reduced upto 11.63% from 22.53% and from 20.39% to 11.40% in Dindori and Mohadi circles respectively in the year 2001 to 2011. Many of the farmers turned towards the production of vegetables and sugarcane. Proximity of market, transportation and fixed price for the vegetables encouraged farmers to cultivate for other crops rather than fruits. It has been observed that in the circles like Koshimbe, Umarale, Nanashe and Vani growth is seen in the producing area of fruit



crops 13.78%, 14.91%, 5.88% and 6.47% respectively. These four circles are covered by hilly terrain which makes loss of seasonal crops so farmers focused more towards annual crops like fruits.

**Graph No. 1: The chart shows the Circle wise distribution of Fruits crops in Dindori Tehsil during 2000-01 to 2010-11**



**Graph No: 01**

Graph no. 01 shows that circle wise changes of area under fruits crops in last decade of Dindori tehsil. The positive growth is seen in the circles like Koshimb, Umarale, Nanashe and Vani, and negative growth is seen in circles like Varkhed, Mohadi and Dindori.

### Conclusion

Above mentioned analysis shows that many farmers of this area are turned towards the production of fruits. It means farmers are turned towards food grain crops to cash crops. It resulted in the growth of cash crop producing area. Growth in fruits and fruit production is seen due to capital, labours, transportation and modern irrigation system. In some parts of farmers are turned towards flowers plantation, vegetables and other crops due to Proximity of market, transportation and fixed price, modern technology, irrigation etc. The four circles like Koshimb, Umarale, Nanashe and Vani by are covered hilly terrain yet positive results are seen in fruit crops due to subsidized irrigation, low labours, guarantee of produce and fixed price.

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## Management of E- Waste: A Glocal Approach

**Mr. Sachin Ranu Govardhane**

VVMs, S.G.Patil Arts, Comm. & Sci. College,  
Sakri, Dist- Dhule (MS)

**Dr. Suresh Kautik Shelar**

G.E.T.s Arts, Comm. & Sci. College,  
Nagaon, Dist- Dhule (MS)

\*\*\*\*\*

**Key Words:** E-waste, Global trade issues, E-waste Management,

### Introduction:

The electronic industry is the world's largest and fastest growing manufacturing industry (Radha, 2002, DIT, 2003). During the last decade, it has assumed the role of providing a forceful leverage to the socio – economic and technological growth of a developing society. The consequence of its consumer oriented growth combined with the rapid growth of electronic waste and technological advancement are new environmental challenge. It is an emerging problem as well as a business opportunity of increased significance. The e-waste generated includes iron, copper, aluminum, gold & other metals over 60%. While plastic account for about 30% and the hazardous pollutants comprise only about 2.70% (Widmer, 2005)

Electronic waste or Waste Electrical, Electronic and Equipments (WEEE) describe loosely, discarded, surplus, obsolete or broken electrical or electronic devices. It includes some electronic scrap components such as CRTs contains contaminations such as lead, Cadmium, beryllium, mercury and brominated flame retardants. "Electronic Waste" may also include secondary computers, entertainment devices,

electronic mobile phones and other items such as television sets and refrigerator whether sold, donated or discarded by their original owners. The United States Environmental Protection Agency (EPA) includes discarded CRT commodities, if they are not discarded or left unprotected.

Informal Processing of electronic waste in developing countries causes serious health and pollution problems. Even in developed countries recycling and disposal of e - waste may involve significant risks to workers and communities and great care must be taken to avoid unsafe exposure in recycling operations and leaching of materials should be managed with caution and the significance of proper management of e-waste can not be overemphasized.

The present paper attempts to highlight the issue of e-waste management and its association with international policies and strategies particularly with reference to India.

### Objectives:

1. To Study the existing scenario of electronic waste in india with special reference to Mumbai.
2. To Suggest appropriate measures to minimize the effect of e-waste.

### Methodology :

This paper attempts to evaluate e-waste management practices in the city of Mumbai with special reference to its management. For this information has been often from government website and published report.

### The Problems:

The rapid changes in technology, low initial cost and planned obsolescence have resulted in a fast growing surplus of electronic waste around the globe. Dave Kruch. CEO of Cash For Laptops, regards electronic waste as a rapidly expanding issue. The legal framework, a collection system, logistics and other services need to be implemented properly for applying any technical solution to this growing problem.

An estimated 50million tons of e-waste



is produced each year globally. The USA discards 30 million computers each year and 100 million phones are disposed in Europe every year. The EPA estimates that only 15-20% of e-waste is recycled, the rest of these electronics go into landfills and incinerators. (EPA estimates for 2006-07). In United States, an estimated 70% of heavy metals come from discarded electronics.

The Guiyu in the Shantaou region of China, Delhi and Bangalore in India as well as the in parts of Ghana have electronic processing areas. Uncontrolled burning, disassembly and disposal causes a variety of environmental problems such as ground water contamination, atmospheric pollution or even water pollution either by immediate discharge or due to surface runoff especially in coastal areas as well as health problems including occupational safety and health effects among those directly and indirectly involved, due to the methods of processing waste. Thousands of men, women and children are employed in highly polluting, primitive recycling technologies, extracting the metals, toners and plastics from computers and other electronic waste. Recent studies show that 7 out of 10 children in this region have too much lead in their blood.

#### **E- Waste and Global Trade Issues:**

E-waste from developed countries finds an easy way into developing countries in the name of free trade (Toxic Link, 2004). The regulation of e-waste creates economic disincentives to remove the residuals prior to export. There are number of issues associated with the global movement of e-waste under international trade. The critics of trade in used electronics mention that it is too easy for brokers calling themselves recyclers to export unscreened electronic waste to developing countries. Hard rock mining of copper silver, gold and other materials extracted from electronics is considered to be more dangerous environmentally than the recycling of those materials. It is also true that repair and reuse of

computes and televisions has become a lost art for developed nations. Works like "The Waste Makers" by Vance Packard explain some of the criticism of exports of working products, for example the ban on import of tested working Pentium laptops to China, or the bans on export of used surplus working electronics by Japan.

Opponents of surplus electronics exports argue that the lower environmental and labor standards, cheap labor and the relatively high value of recovered raw materials lead to a transfer of pollution generating activities, such as burning of copper wire. In China, Malaysia, India, Kenya and various African countries, electronic waste is being sent to these countries for processing some times illegally. Many surplus laptops are routed to developing nations as "dumping ground for e-waste". Because the United States has not ratified the Ban-Amendment and has no domestic laws forbidding the export of toxic waste, the Basal Action Network estimates that about 80% of the electronic waste directed to recycle in the United States does not get recycled there at all, but is put on container ships & sent to countries such as China.

Independent research by Arizona State University showed that 87 - 88% of imported used computers did not have a higher value than the best value of the constituent materials they contained, and that "the official trade in end-of-life computers is thus driven by reuse as opposed to recycling.

Proponents of trade say growth of internet access is a stronger correlation to trade than poverty. Haiti is poor and closer to port of New York than South Asia, but far more electronic waste is exported from New York to Asia than Haiti. Thousands of men, women and children are employed in reuse, refurbishing, repair and remanufacturing in developing countries. It is held that denying developing nations access to used electronics may deny them affordable products and internet access. However, the developing countries utilize methods that are



more harmful and more wasteful. The most suitable and convenient method is simply to toss equipment onto an open fire in order to melt plastic and to burn away non valuable metals. The fumes released from this contribute acrid and lingering smog.

Today, electronic waste recycling business is in all areas of the developed world a large and rapidly consolidated business. In developing countries, electronic waste processing usually first involves dismantling the equipment into various parts often by hand. Recycling raw material from end-of-life electronic material is most effective solution to the growing e-waste problem. Most electronic devices contain a variety of materials, including metals that can be recovered for future use. The Basal Convention on the Control of Trans boundary Movements of Hazardous Waste and Their Disposal, usually simply known as Basal Convention, is an international treaty that was designed to reduce the movements of hazardous waste between nations, and specifically to prevent transfer of hazardous waste from developed to less developed countries. Of the 172 parties to the convention, Afghanistan, Haiti and the United States have signed but have not yet ratified it.

#### Indian Scenario:

The problem of e-waste management is a major task in India and becoming increasingly complicated by invasion of computer waste particularly. During 2005, 146, 000 tons of e-waste was generated in the country. The current practices in India in this context have number of loopholes such as difficulties in inventorisation, unhealthy conditions and informal recycling, inadequate legislation, poor awareness and reluctance on part of corporate address the critical issue (Joseph K. 2007).

It is difficult to quantify the amount of e-waste generated in India and imported from developed world mainly because there is no separate collection of e-waste in India. In India,

the preferred way to get rid out of e-waste generation is to exchange from retailers while purchasing a new item. The business sector is estimated to account for 78% of all installed computers in India (Toxic Links, 2003). The outdated computers from the business sector are sold by auctions. Some times educational institutions or charitable institutions receive old computers for reuse. The estimated number of outdated personal computers generating from business and individual household each year in India will be about 1.38 million. According to a report of Confederation of Indian Industries, the total waste generated by outdated or broken electronic devices in India has been estimated to be 1,46,000 tons per year (CII, 2006).

Although the per capita e-waste generation in India is relatively low, the total Volume of outdated electronic devices will be huge and is growing at a faster rate. The growth rate of mobile phone (80%) is very high as compare to the Personal computers (20%) and Television (18%). Additionally, considerable quantities of e-waste are reported to be imported (Agarwal, 1998, Toxic Link, 2004). However no confirm figures available on how substantial are these trans boundary e-waste streams, as most of such trade in e-waste is conducted under the name of 'reusable' equipments or 'donation' from developed nations. The government trade data does not distinguish between imports of new & old electronic goods.

Electronic wastes can cause widespread environmental damage due to the use of toxic materials in the manufacture of electronic goods (Mehra, 2004). Land filling of electronic waste can lead to the leaching of Lead into the ground water. If the CRTS is crushed and burned, it emits toxic fumes into the air (Ramchandra and Saira, 2004). The cadmium from one mobile phone battery is enough to pollute 600 cubic meters of water (Toxic Links, 2002). It may further result in contamination of soil.

The electronic waste in India is



dismantled and sorted manually. It is a livelihood of unorganized recyclers and due to lack of awareness they are risking their health and the environment as well. No sophisticated machinery or personal protective equipment is used for extraction of different materials. All the work is done by routinely involved in the operations. Waste components which does not have any resale or reuse value are openly burnt or disposed off in open dumps. Pollution problems associated with such backyard smelting using crude processing are resulting in release of heavy metals of health concern.

Despite a wide range of environmental legislation in India there are no specific laws or guidelines for electronic waste of computer waste (Devi, 2004). The need is therefore to adopt proper strategies and policy frameworks for mitigating the problem of solid waste particularly that of electronic waste. As per hazardous Waste Rules (1989), e-waste is not treated as hazardous unless proved to have higher concentration of certain substances. As the collection and recycling of electronic waste is done by informal sector in the country at present, the Government has taken the following steps to enhance awareness about environmentally sound management of electronic waste (CII, 2006):

1. Several Workshops on Electronic Waste Management was organized by the Central Pollution Control Board (CPCB) in collaboration with Toxic Links.
2. Action has been initiated by CPCB for rapid assessment of the E-waste generated in major cities of the country.
3. A National Working Group has been constituted for formulating strategy for E-waste Management.
4. A comprehensive technical guide on "Environmental Management for Information Technology Industry in India" has been published and circulated widely by the Department of Information and technology (DIT), Ministry of Communication and Information Technology.

5. Demonstration projects have also been set up by the DIT at the Indian Telephone Industries for recovery of copper from Printed Circuit Boards.

Though Government of India has taken many initiatives in the direction of proper implementation of e-waste management plans, there are many challenges faced by the Government of India while safely managing the electronic waste. Few of these are – lack of reliable data, limited effective recycling plants (estimated 10%) and lack of safe e-waste recycling infrastructure in informal sector and the existing recycling units are purely business driven with intervention by the government. 'The Government of India is considering banning the imports of used computers and other electronic waste coming from developed countries such as United States, Canada, Australia and parts of Europe, after several cases of smuggling came to light recently.' (Thakur Pradeep, TNN, Sep 6, 2010). Electronic waste is being dumped in the country by developed nations using loopholes in domestic rules which allow NGOs and educational institutions to import such gadgets freely on the pretext of donations. Conscious of the fact that huge shipments of e-waste generated in developing countries are finding convenient burial ground in India, the government had through a public notice on May, 13, 2010 prohibited educational and other institutions from importing second hand computers, laptops and computer peripherals including printers, plotters, scanners, monitors, keyboards and storage units. The step was short of a complete ban on such imports. Environmental agencies worldwide estimate dumping of e-waste in India is likely to go up by 500% in the next 10 years. Already, environmental bodies estimate India generates nearly 4, 00, 000 tons of e-waste annually which is likely to double in the next few years. The disposal mechanism in India needs to be improved to find way out to the universal problem of e-waste generation not only from



domestic use but also imported outdated electronic devices.

#### Status of E-Waste Management in Mumbai:

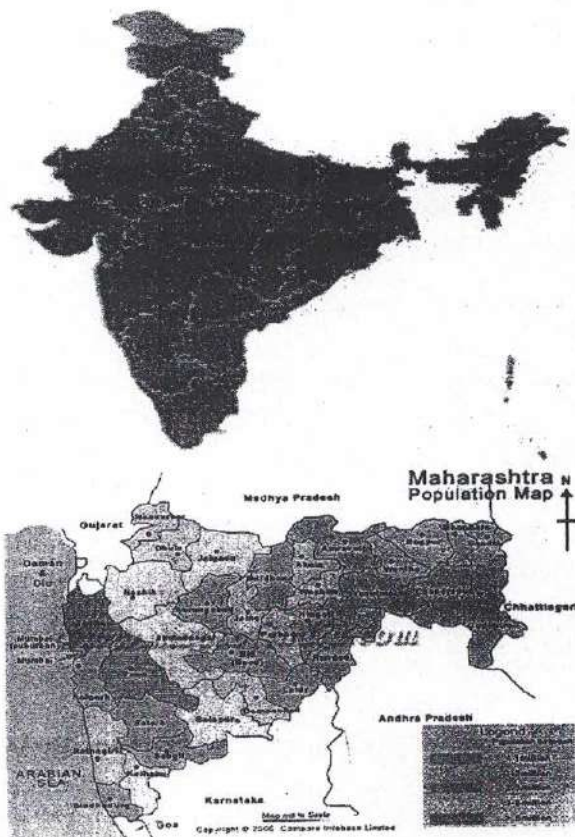
The urban centers in India are facing various environmental and health hazards which is accelerated by increasing problem of E-waste generated in probably all the cities in the nation. The Central Pollution Control Board (CPCB) predicted that the country's annual e-waste production will increase up to 800,000 tons by the year 2012. The statement said the CPCB survey found Mumbai is the highest e-waste producing city in the country followed by Delhi, Bangalore, Kolkata, Chennai, Ahmedabad, Hyderabad, Pune, Surat and Nagpur. "There are 36,165 hazardous waste generating industries in the country. 6.2 million tons of hazardous waste is generated by them every year, of which landfillable waste is 2.7 million tons, incinerable 0.41 million tons and recyclable hazardous waste is 3.08 million tons", (IANS, 2010).

Being the financial capital of the nation, Mumbai's banks and financial institution generate huge amount of WEEE but they do not have any method for safe handling that results in disastrous health and environmental impacts of WEEE. Mumbai is not just the leading e-waste producing city in the nation but also that the rate at which it is throwing away electronic goods is much higher than desirable. The study by Toxic Links shows that the volume of e-waste generated in the city is about 19,000 tons annually – inclusive of computers, televisions, refrigerator and washing machines. Besides the city receives the good amount of e-waste through imports from the developed world. Therefore the actual quantity is expected to be much higher as several other electronic products which have not been used are being dumped into the city's waste stream, and also there are no figures available on imports from developed nations. The national capital (Delhi) and its adjoining areas receive a substantial part of Mumbai's electronic discards both internal and

imported electronic devices.

Mumbai has a large network of scrap traders. There are several sites where the e-waste is dumped. Few of them are- Kurla, Sakinaka, Kamathipura – Grant road, Jogeshwari and Malad. (Toxic Links, 2007).

Maharashtra Pollution Control Board (MPCB) has received financial and technical assistance from United Nations Environment program (UNEP) to carry out e-waste assessment study for the Mumbai & Pune region.



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## 12. A Study of Area under Vegetables Crops and Changes Therein in Dindori Tehsil (MS)

**Prof. S. R. Govardhane**

Assistant Professor, S. G. Patil Arts, Sci. and Comm. College Sakri, Dist. Nandurbar.

**Dr. S. K. Shelar**

Research Guide, G. E. T's Arts, Sci. and Comm. College Nagaon, Dist. Dhule (M. S.).

### Abstract

Vegetables are parts of plants that are consumed by humans as food as part of a meal. Plants collectively to refer to all edible plant matter including the flowers, fruits, stems, leaves, roots, and seeds. Vegetables play an important role in human nutrition. Most are low in fat and calories but are bulky and filling. India is the second largest producer of fruits and vegetables in the world next only to China and accounts for about 15% of the world's production of vegetables. Dindori tehsil is part of Nashik District. Dindori town is administrative headquarter of Dindori tehsil. It is located between 20° 03' 25" to 20° 27' 06" North Latitude and 73° 34' 06" and 74° 00' 06" East Longitude. The Tehsil has a total area of 1342.19 sq km. The present study is based on secondary data and simple comparative method has been used to analysis the data. Present study carry on circle level and consider area under vegetables crops of last decade (2000-01 and 2010-11) detect changes. This study concludes that, in some areas has been observed extremely increased of area under vegetable crops because of the modern irrigation techniques, high yield technique in vegetable crops and growing population demands.

**Key Words:** Vegetables, Food, Nutrition, irrigation, high yield etc.

### 1. Introduction

Vegetables are parts of plants that are consumed by humans as food as part of a meal. Plants collectively to refer to all edible plant matter including the flowers, fruits, stems, leaves, roots, and seeds.<sup>(5)</sup> Vegetables play an important role in human nutrition. Most are low in fat and calories but are bulky and filling.<sup>(1)</sup> India is the second largest producer of fruits and vegetables in the world next only to China and accounts for about 15% of the world's production of vegetables. Presently, India produces about 163.38 million metric tons of vegetables from an area of 9.35 million hectares with an average productivity of 17 Mt/Ha.<sup>(7)</sup> The vegetable



requirement is 300g/day/person as recommended by dietician. Vegetable crops being highly seasonal so capital and labour intensive and need and transportation. In study region irrigation facilities and increasing demand of growing population are developed that's accelerating the production of vegetable crops.

## 2. Objective

The main objective of this research work to study area under vegetables crops and changes therein in Dindori tehsil of Nashik District.

## 3. Methodology

The present study is based on secondary data and simple comparative method has been used to analysis the data with bar diagrams using area under vegetables crops in last decade (2001-2011).

## 4. Study Area

Dindori tehsil is part of Nashik District. Dindori town is administrative headquarter of Dindori tehsil. It belongs to Kandesh and northern Maharashtra region. This study region consist 158 villages. The region is bounded by Chandwad and Niphad tehsils on east, Nashik tehsil on south, Surgana and Kalwan on north while on the west by Peint tehsil of Nashik District. It is located between 20° 03' 25" to 20° 27' 06" North Latitude and 73° 34' 06" and 74° 00' 06" East Longitude. The Tehsil has a total area of 1342.19 sq km. Dindori tehsil has been contributed 8.64% area of the Nashik District.

## 5. Discussion

Tomato, Flower, Chili, Cabbage, Palak, Ladies Finger, Onion, Bitter Gourd (Karela), Pumpkin Cauliflower, Brinjal etc. mostly cultivated in study area. Area under vegetables increased due to urbanization and increased purchase power of people. It is mainly grown in fringing area of urban centers or cities.

Total area under vegetables in Dindori tehsil is 11993.62 hectares in 2010-11. In last decade area under vegetables increased from 7729.90 hectares in 2000-01 to 11993.62 hectares in 2010-11. The area under vegetables crops noted highest in part of tehsils especially Dindori, Mohadi and Verkheda because of irrigation facilities and demands of urban population. Out of that highest area under Vegetables crops observed in Dindori circle by 2168.44 hectares which 18.08 percent out of total area under vegetables crops in 2010-11. Followed by Dindori circle, Varkhedi and Mohadi circles have also makeable area under vegetables crops by 16.82 percent



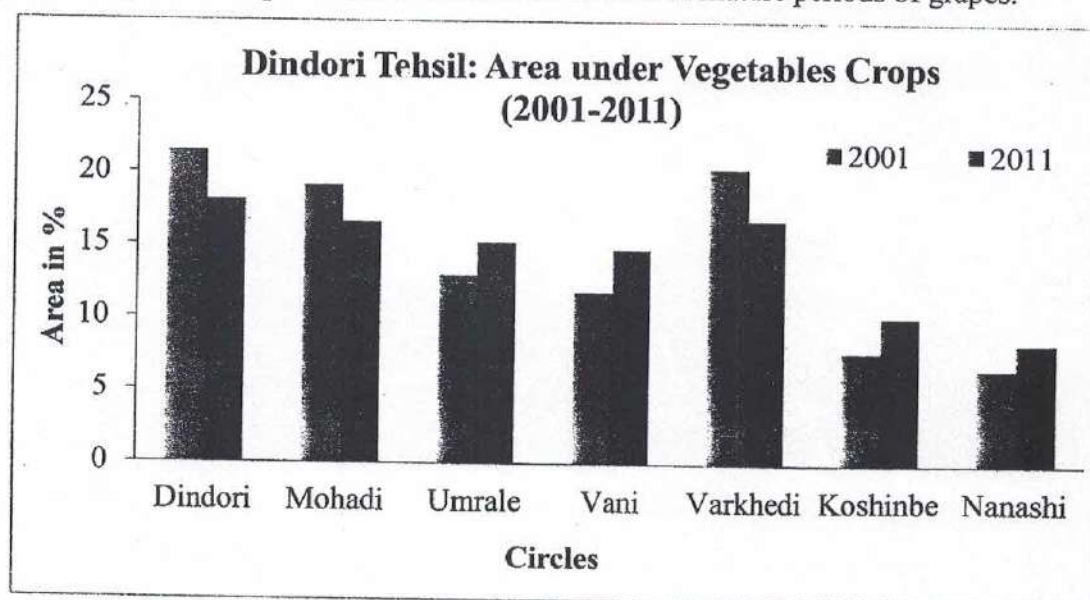
(2017.32 hectares) and 16.55 percent (1984.94 hectares) respectively. In other circles area under vegetable crops varies from 8.40 to 15.19 percent. Grape is important cash crop of this region that's why farmers took less focus on cultivation of vegetable crops.

**Table No. 1 – Dindori Tehsil: Area under Vegetables Crops (2001-2011)**

Sr. No.	Circle	Area in %		Volume Changes in %
		2001	2011	
1	Dindori	21.47	18.08	-3.39
2	Mohadi	19.11	16.55	-2.56
3	Umrade	12.89	15.19	2.30
4	Vani	11.78	14.74	2.96
5	Varkhedi	20.37	16.82	-3.55
6	Koshinbe	7.76	10.22	2.46
7	Nanashi	6.62	8.4	1.78

Source: Tehsil Office and Tehsil Agricultural office, Dindori Tehsil.

Table No. 1 shows remarkable positive changes of area under vegetable crops in Vani tehsil. In 2001, Dindori Circle (21.47%) has noted high percentile area under vegetable crops but that has been decrease up to 18.08 percent in 2011 because of decrease in irrigation facilities in Vani Circle. In last decade highest negative changes of area under vegetable crops has been observed in Varkhedi Circle by 3.55 percent and positive changes in Vani circle by 2.96 percent. In Umrade, Vani and Koshinbe circles area under vegetable crops increased because of failure in grapes farming due to unpredictable rainfall and hail fall in mature periods of grapes.



**Figure: No. 1**



Fig No. 1 shows Changes of area under Vegetable crops in last decade in Dindori circle. In Umrle, Vani and Koshinbe and Nanashi circles have noted positive changes of area under vegetable crops while Varkhedi, Dindori and Mohadi circles have noted negative changes in area under vegetable crops.

## 6. Conclusion

Above discussion that most farmers (irrigated) cultivated are vegetable crops as cash crops. That's why area under cash crops has noted changes even in small span of time in Dindori tehsil. In some areas has been observed extremely increased (Vani circle) of area under vegetable crops because of the modern irrigation techniques and high yield technique in vegetable crops. The modern technique in vegetable crops can be used for rapid multiplication of newly developed high yielding, early yielding, disease resistant varieties and rejuvenation of outstanding varieties under cultivation. Vegetable crops are a high water requirement crop. Deficiency of labour force required for agricultural practices of vegetable crops in all stages also been also responsible for deduction of area under vegetable crops in some part of tehsil. So for increasing area under vegetable crops and more profit there should be used modern irrigation techniques for irrigation like drip irrigation instead of flood irrigation and introduce new technology.

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**STUDY OF CROP RANKING IN DINDORI TAHSIL, NASHIK DISTRICT, MAHARASHTRA  
STATE, INDIA**

*Dr. Sachin Ranu Govardhane*

*V.V.Ms S.G. Patil Arts, Science & Commerce College Sakri (Dhule)*

**ABSTRACT**

The cropping pattern is based on both time and space sequence of crops. The variety in cropping pattern is the result of physical economic and social factors. The crop pattern in any region cannot remain static due to the variations in the rainfall amount and nature of inputs and environmental instability. Moreover, introduction of new high yielding varieties of seeds, irrigation facilities and technical knowledge are responsible for temporal changes. The cropping pattern undergoes changes in response to the changing physical and cultural environment. For an appreciation of temporal variations in study area twenty years have been taken into account and study was made with considering a real strength. The present study is carried out basically with the help of secondary data in 2011 year. The secondary data has been collected from Department of Agriculture, Dindori Tahsil Nashik District. The results of the study indicate that Grapes & Fruits are first rank crops in the western part of the study area whereas fodder, Oilseeds, Jowar, Bajara and Other Cereals are the first ranking crop in the dry areas of Dindori Tahsil.

**KEYWORDS:** Crop ranking, cropping pattern

**INTRODUCTION:**

Agriculture plays a vital role in the economy of a country and it is the backbone of our economic system. Agricultural regionalization is important step for agricultural development and through which we understand the regional imbalance and disparities. The study of agriculture region is of great importance in geographical studies. The regional dominance of various crops can be determined by comparing the relatively a real strength of various crops. This can be obtained by ranking them, for each paragon, according to the percentage of the total harvested cropland occupied by each crop (Porwal 1994). The simplest form of the agricultural regionalization of first order is based on either the dominating crop (first ranking crop) or a specific indicator used to define an area. On the basis of crop dominance and ranking device, regions like Corn Belt, Cotton Belt were defined for the United States by American geographers (Singh and Dhillon, 1994). The crop ranking has been done on the basis of dominance of area under specific crops.

The cropping pattern is based on both time and space sequence of crops. The variety in cropping pattern is the result of physical economic and social factors. The physical environment provides a wide range of possibilities for growing crops, but the social and economic conditions determine as to which the crops to be grown are and how much of it is to be devoted to different crops. In fact, social and cultural values strongly influence the cropping pattern especially in the countries where agriculture is a way of life. The farming communities have developed their own techniques and tradition, which affect the growth of crops. These crops are not always being grown when they are best adapted to, nor when these can be grown most economically (Ningaraju and Arun Das 2017).

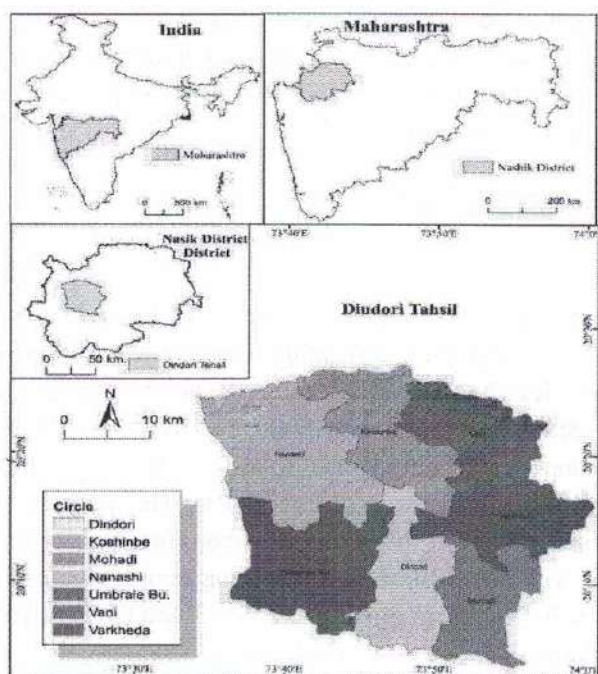
**STUDY AREA:**

The Dindori tehsil lies in west central part of the Nashik District of Maharashtra state. Out of four administrative divisions Dindori Tehsil lie under Nashik sub division. The absolute geographical location of the tehsil can be express as 20° 03' 25" North latitude to 20° 27' 06" North latitude and 73° 34' 06" East



longitude to  $74^{\circ} 00' 06''$  East longitudes. The Kadva River flows west to east. Dindori tehsil is bounded by Peth tehsil towards the west, Surgana tehsil in north-west, Kalwan tehsil towards the north-east, Chandwad and Niphad tehsil towards the east and Nashik tehsil towards the south. Climatologically, it lies in the rain heavy rainfall zone of the Western Ghats and geomorphological, it is located in the Unanda in north and Kadava basin south, a part of upper Godavari basin. The total geographical area (TGA) of the tehsil is about 1342.19 square km. It is about 08.64 percent of TGA of Nashik District. According census the total population during year 2001 of tehsil was 264727 and it was increase up to 315709 during 2011. The population density of the tehsil is 239 persons per square km according to 2011 census. According to abstract of census handbook the tehsil comprises of 157 villages and one urban center i.e. Dindori. The villages are subdivided into various sub circles in 2001 there were four revenue circles in 2011 those circles were modified into six subgroups namely Dindori, Mohadi, Umbrale, Vani, Varkheda, Koshinbe and Nanashi (Map no 1.1)

MAP NO1.1: Location Map



## OBJECTIVES

The present paper is aimed at implementing the cropping pattern detection method for understanding the land use/land cover change in Dindori Tehsil taken place over the period of 2011 present century. The main objective of the present study is to assess cropping pattern and crop ranking in the Dindori Tehsil.

## DATA SOURCES AND METHODOLOGY:

The present study is carried out basically with the help of secondary data in 2011 year. The secondary data has been collected from Department of Agriculture, Dindori Tehsil Nashik District.

## RANKING OF CROPS:



The percentage area under each crop was determined simply by ranking them for study area in order to have percentage of the total net sown area working by each crop. Ranking of crops gives an understanding into the geographical reality of the cropping pattern. Also, ranking of crops helps in knowing the crops which contend with each other to improvement more hectare under cultivation. Afterwards measuring the relative gift of different crops in a geographical unit the process of planning can be introduced more sensibly for the best use of the available land for cultivation. A careful use of land with acceptable inputs in detail can help in rising the agricultural production even in the fewer fertile, soil. Thus, the study is useful in doppelganger regional disparities in the agricultural income and economy. Without the major crops of the Dindori Tahsil are studied in their ranking order and the areal strength of each crops is resolute, a suitable association of soil and soil inspirational crops for each situation cannot be determined.

### RANKING METHOD

Ranking method can be studied by expressive and measurable methods to outline the ranking of separate crops according to their areas of position in each element unit. The crop with the larger percentage segment to the net sown area forms the first ranking crop and the crop with the next largest share becomes the second ranking crop. Also calculations have been made up to 01 to 10th ranking crops have been plotted in figure table 1.1, 1.2 and 1.1 for the year 2011.

Table No 1.1: Crop Ranking village wise Frequency in 2011

Ranking Crops	1 <sup>st</sup> and villages	2 <sup>nd</sup> villag es	3 <sup>rd</sup> villag es	4 <sup>th</sup> villag es	5 <sup>th</sup> villag es	6 <sup>th</sup> villag es	7 <sup>th</sup> villag es	8 <sup>th</sup> villag es	9 <sup>th</sup> villag es	10 <sup>th</sup> villag es
Oilseeds	11	37	29	30	31	10	5	3	1	0
Other Cereals	37	19	20	13	22	24	16	6	0	0
Vegetables	10	26	18	16	14	24	22	19	8	0
Grapes & Fruits	53	23	10	7	7	17	16	15	8	1
Wheat	10	18	33	37	33	9	13	4	0	0
Spices	0	0	0	3	5	3	11	31	60	44
Sugarcane	1	1	3	2	1	8	11	8	40	82
Pulses	0	9	12	17	23	42	32	20	2	0
Fodder	31	4	8	7	9	13	19	37	20	9
Rice	4	20	24	25	12	7	12	14	18	21
Total Villages	157	157	157	157	157	157	157	157	157	157

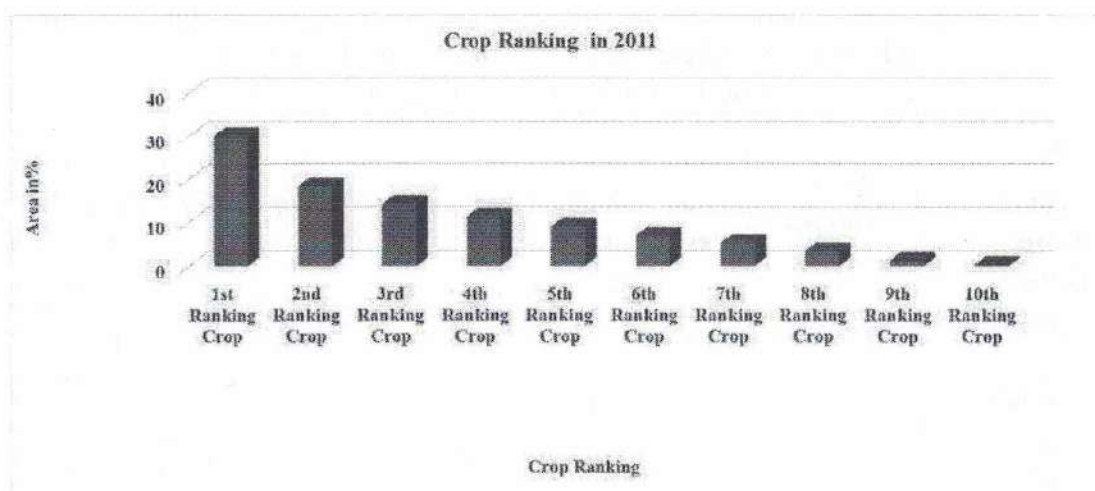
Table 1.2: Rank wise area in percent in year 2011

Crop Ranking	2011	
	Area in Hectors	Area in Percent
1 <sup>st</sup> Ranking Crop	4731.08	30.13
2 <sup>nd</sup> Ranking	2886.65	18.39



Crop		
3 <sup>rd</sup> Ranking Crop	2238.03	14.25
4 <sup>th</sup> Ranking Crop	1766.31	11.25
5 <sup>th</sup> Ranking Crop	1410.85	8.99
6 <sup>th</sup> Ranking Crop	1082.55	6.90
7 <sup>th</sup> Ranking Crop	814.73	5.19
8 <sup>th</sup> Ranking Crop	531.62	3.39
9 <sup>th</sup> Ranking Crop	198.80	1.27
10 <sup>th</sup> Ranking Crop	39.38	0.25

Graph no 1.1: Crop ranking area in % year of 2011



The first ranking crops in the Dindori tehsil. Eight crops have been identified as first ranking crops during the year 2011. These Eight crops are, namely, Oilseeds, Other Cereals, Vegetables, Grapes & Fruits, Wheat, Sugarcane, Fodder and Rice crop. Out of these all crops Other Cereals (37), Grapes & fruits (53), Fodder (33), Oilseeds (11) While in 2011 the Other Cereals (37), Grapes & fruits (53) and Fodder (31) having almost 81 percent of total area of the tehsil within first ranking crop. During 2011 the first ranking crops were occupied about 4731.08 hectores area which is about 30.13 percent of total area of the tehsil. While the 2011 the grapes in fruits occupied largest area in first ranking. After grapes and fruits the other cereal and fodder crops were first ranked spatially located at western and middle part of the villages within the tehsil. the crop ranking in which farmers are mainly focus to produce cash crops like grapes and fruits because suitable soil condition and major irrigation facility available nearby Kadava river basin and Kadava dam. Also several vineries industries were established in the south eastern part of the Dindori tehsil which is responsible to increase in area under Grapes and Fruits. In western part of the tehsil other cereal and fodder crop were produces by farmers because of most of population is tribal and the focus on traditional trend of cropping pattern. Ten ranking crops area increased by 39.38 percent on 2011 determining on 0.25 percent area of the tehsil. Table 1.1 and 1.2 indicating the village wise area under tenth ranking crops. The major crop were sugarcane (103), rice (29) and spices (11) in 2001. These crop cultivating 13.66 (36.80 percent), 14.11 (38.01 percent)



and 4.89 (13.17 percent) hector area respectively. In 2011 the same major crop were cultivated in the tehsil but the area under rice (16.63 percent) crop significantly decrease while area under spices (27.42 percent) were significantly increase. In which except south eastern part of rice cultivated area all other area under sugarcane crop. There were some patches of spices in central part of the tehsil. In 2011 patches of spices and area under sugarcane were significantly increase. While the area under rice cultivated villages were decreased.

## CONCLUSION

The overall differences between wet and dry taluks can be as follows

- 1) Rich crop has been cultivated as first ranking crop in the western part and Grapes & Fruits is first rank crops in eastern part of the study area.
- 2) Fodder, Oilseeds, Jowar, Bajara and Other Cereals are the first ranking crop in the dry area in Dindori Tahsil whereas the wet crops like sugarcane and Grapes & Fruits is produced as the first.
- 3) There is a intermix of Oilseeds, Fodder, Jowar and Other Pulses as forth and fifth ranking crops in the study area in different periods.
- 4) Among the dry taluks, other pulses and Fodder are the second and third ranking crops.
- 5) There exist differences in the ranking of crops, between wet and dry taluks with in the same ranks up to fifth rank. The middle order ranks like sixth, seventh and eight ninth, tenth possess few wet crops in the dry taluks. This type of trend cannot be noticed in, eleventh and twelfth crops between wet and dry taluks.

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## Application Of Rs And Gis In Land Use / Land Cover Pattern, Dindori Tahsil, Nashik District Ms., India.

**Dr.Sachin Ranu Govardhane**

V.V. Ms S.G. Patil Arts, Science & Commerce College Sakri (Dhule)

### ABSTRACT

*The influence of human activities on land use/land cover change takes strained a consideration of researchers studying in the field of land resource. Experimental opinion open a change in land use land cover classification in Dindori Tahsil, In this paper an challenge is completed to study the changes in land resources utilization and land cover with the change in Dindori Tahsil over 06 years period (2010 and 2016). The study has been completed throughout remote sensing approach using LandSat imagery of Oct. 2010 and Oct. 2016. The land use and land cover classification was performing based on the Survey of India map and Satellite imageries. GIS software is used to arrange the thematic maps. Landsat 5 and 7 Sensor is Enhanced Thematic Mapper Plus (ETM+) with the dated Oct. 2010 (Landsat TM 5) as well as the Spatial Resolution is 30\*30 Meters. Landsat 8: Sensor is Operational Land Imager (OLI) and Thermal Infrared Sensor (TIRS) images. Dated is Oct. 2016 (Landsat 7 ETM) with Spatial Resolution is 30\*30 Meters band used 2,3,4. The present study is focused on understanding the land use/land cover changes of Dindori Tahsil in Nashik District of Maharashtra for the period of first to thirteen years of present century.*

**Key words:** Land use / Land Cover, Change, Remote Sensing, GIS, Dindori.

### INTRODUCTION:

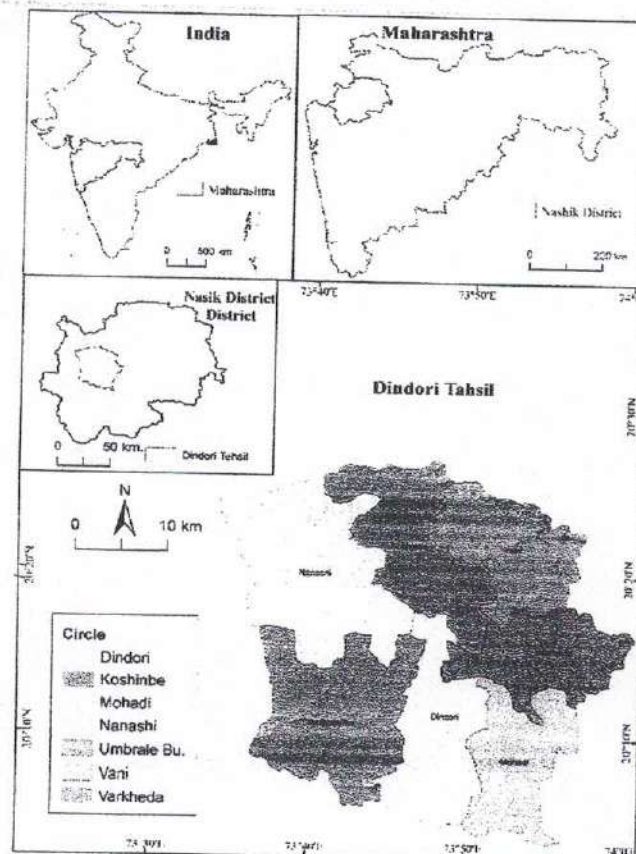
Today, the speedy expansion of anthropogenic activities is resulted into the rapid land use/land cover changes across the world. The study of these changes enables the administrators and planners to enhance the productivity levels of available land resources. It helps in improve the regional disparity and the imbalances resulted due to the mishandling of land resources. The changing land use/land cover pattern and increasing use of land for different socio-economic activities has resulted in to the paucity of this very basic resource available to man. Thus, the knowledge regarding land use/land cover and possibilities for their best use is essential for the scheduling and operation of land use systems to fulfill the basic needs of human being and hence the studies on land use / land cover change has become very important. It has become a vital constituent in resource management and understanding the dynamics of environmental status of a region. Observation of earth's surface from space have now become essential for understanding the human impact on land use / land cover patterns and is possible with the help of techniques of remote sensing and GIS. Now days, the encroachment of agriculture, settlements, roads and man-made water bodies on the forest areas has become a common practice, which has resulted into the shrinking of area under natural vegetation. In this situation, the studies on detection of change in land use/ land cover has become a need of hour. With this background, the present paper attempts to understand the land use/land cover changes in the Dindori Tahsil of Nashik District.



## STUDY AREA:

The Dindori tehsil lies in west central part of the Nashik District of Maharashtra state. Out of four administrative divisions Dindori Tehsil lie under Nashik sub division. The absolute geographical location of the tehsil can be express as  $20^{\circ} 03' 25''$  North latitude to  $20^{\circ} 27' 06''$  North latitude and  $73^{\circ} 34' 06''$  East longitude to  $74^{\circ} 00' 06''$  East longitudes. The Kadva River flows west to east. Dindori tehsil is bounded by Peth tehsil towards the west, Surgana tehsil in north-west, Kalwan tehsil towards the north-east, Chandwad and Niphad tehsil towards the east and Nashik tehsil towards the south. Climatologically, it lies in the rain heavy rainfall zone of the Western Ghats and geomorphological, it is located in the Unanda in north and Kadava basin south, a part of upper Godavari basin. The total geographical area (TGA) of the tehsil is about 1342.19 square km. It is about 08.64 percent of TGA of Nashik District. According census the total population during year 2001 of tehsil was 264727 and it was increase up to 315709 during 2011. The population density of the tehsil is 239 persons per square km according to 2011 census. According to abstract of census handbook the tehsil comprises of 157 villages and one urban center i.e. Dindori. The villages are subdivided into various sub circles in 2001 there were four revenue circles in 2011 those circles were modified into six subgroups namely Dindori, Mohadi, Umbrale, Vani, Varkheda, Koshinbe and Nanashi (Map no 1.1)

MAP NO1.1: Location Map





## OBJECTIVES

The present paper is aimed at implementing the change detection method for understanding the land use/land cover change in Dindori Tahsil taken place over the period of first thirteen years of present century. This has been achieved with the help of following objectives.

1. To create land use/land cover mapping from satellite images.
2. To find out the change in land use/land cover in the study area.

## METHODOLOGY:

To make the change study and processing of the study area two images from the Satellite data. Assessment of images and computation of area under different land use/land cover classes with the help of different images was done. In view of considering the change in land use/land cover in the study area, two satellite images viz. LANDSAT 5 TM, Thematic Mapper Plus images consist of three spectral bands with a spatial resolution of 30 meters for Bands 2, 3, 4 on dated since Oct. 2010 and Oct 2016, LANDSAT 7 ETM Operational Land Imager and Thermal Infrared Sensor images consist of three spectral bands with a spatial resolution of 30 meters for Bands 2 to 4 dated is Oct. 2016 were compared with each other. Key for interpreting satellite imagery elements is shown following Table 01.

The multi-spectral satellite data is used for supervised classification for prepare Land use map. The software ERDAS-9.2 and ARCGIS-9.3 is used data acquisition and processing. The data utilized is given in the following tables for the years 2010 and 2016. Such as the ArcGIS and ERDAS have been used for geographical analysis, integration, and presentation of the spatial and non-spatial data for land use map.

**Table: 01 Interpretation Key for Understanding Satellite Imagery Elements**

Sr.no	Elements	Explanation method	Descriptions
01	Dense Forest	It exhibits dark to Bright faint Green colour.	This is categorized as dense, sparse and scattered (low) plants utilization.
02	Sparse Forest		
03	Shrubs or Low Forest		
04	Agricultural Land	Yellow colour area under this category.	This is categorized land under crops, fallow plantation.
05	Barren Land	Gray colour area under this category.	It is uncovered land devoid of plantation.
06	Shadow Land	Black colour area under this category.	-
07	Settlement	It is having regular pattern	This category includes urban and rural



		and appears in Red colour.	settlements utilization.
08	Water Bodies	Water bodies include those dark to light Blue colour.	This category comprises area with surface water in from of ponds, drains and dam.

Source: Compiled by Research

Area statistics of each land use category is calculated in Meters and Percentage table. The land use cover classification includes Dense, Sparse and Shrubs or Low Forest, Agricultural, Barren, Shadow Land, Settlement, Water Bodies. The characteristic classes be identified based on the visual interrelation of the satellite imagery. And used the other cartography technique like Bar Graph, Pay Charts apply for the distribution of general land use and changes land use .

## RESULTS AND DISCUSSION:

Land use is a primary indicator of the extent and degree to which man has modified the land resources. It is application of human control in a systematic manner, indicating an intimate relationship between prevailing ecological conduction and man (Vink1975, Gadekar D.J 2016) the study area classified forest, barren land, built upland, Water bodies, fallow land, and agriculture land. Land use change detection is a process of identification and analyzing the difference of an objective or a phenomenon through monitoring at different times.

### • AGRICULTURAL LAND:

In 2010 the agricultural land was 910.38 sq. km .it was observed in the eastern part of the eastern part where the physical conduction is suitable for the agriculture. The western, north and south part of this study area has very less distribution with small farm size due to the hilly area and mountainous soil. The maximum agricultural land covered in Umarale circle174.15sq. kmand second rank Nanashi this two circle topographical position was non hilly area. The very low agricultural area occupied circle was Mohadi area about 96.09sq. km this area location in western side with hilly area. In 2016 area under this category was 917.44 sq. km which showed the positive change by 7.06sq. km because of increasing irrigation facilities and increasing a water bodes area. That times maximum agricultural land under circle was Umarale abut area in 174.08sq. km. In Table no one, two and Graph no 01 and 02. In case eastern part is mostly positive growth and same part of north and south is moderated positive growth. In 2010 to 2016 this periods positive change agricultural area in Dindori, Kasbevani, Wakheda and Mohadi circles.

### • BARREN LAND:

These categories of land use comprise all such lands which are basically unproductive and flabby for cultivation. These lands are rocky, pebbly, and gruff, kankarized, surface sandy waste or saline tracts which cannot be carry under cultivation or non-agricultural area. In 2010 maximum barren land under Nanashi circles area about



52.32 sq. km because of low irrigation facilities, low fertile soil, hilly area and minimum barren land under Warkheda circles area about 9.07 sq. km this circles under area was good surrounding position in irrigation, available fertile soil and non-hilly area. In 2016 Barren land occupied 195.27sqkm area. The barren land was negative change in between 2010 to 2016, area about that 9.32sqkm area. The negative change of barren land because of increasing irrigation amenities and under area, more developing agricultural area, increasing a forest area in each circle and increasing settlement area. The barren land maximum that time in Nanashi circle area about 50.1 sqkm and minimum area under circle was Warkheda area about 9.07 sqkm because of more irrigation facilities, good fertile soil and good agricultural land.

## • SETTLEMENT:

In 2010, 40.28 sq.km areas were covered by built up land. It was mainly concentrated in the eastern, south eastern part in study area near ofis good concentrated and other part settlements distribution is scattered types. The urban and rural settlements have classify two types way but low urban built up land. The maximum urban built up area were Dindori, Kasbevani and Mohadi circles area about 2.59, 3.5, 1.84 sq.km. Rural settlement all average circles having 32.35 sq.km area and each circle rural settlement area about 5.1, 4.36, 5.23, 5.96, 3.2, 5.21 and 3.29 sq.km. In 2016 urban built up land 8.59 sq.km the positive urban area about 0.66sq.km. The maximum urban area under Kasbevani circles because of near the main Nashik city and sport the non -hilly area. Rural build up under area 37.52 sq.km and each circles area was 6.1, 5.23, 6.01, 6.87, 3.5, 5.9 and 3.91sq.km. The eastern part had highest area under this category and north east as well as the south and south east part are good positive change under land of settlement. Because of water available and agricultural area was good developments.

## • FOREST LAND:

Evergreen forest is distributed in this study area. Due to high temperature and rainfall distribution whereas the western part. But eastern part deciduous type forest is distributed due to less distribution of rainfall. In this study area total forest area 133.62sq.km areas under forest in 2010. The maximum area under a forest circle was Nanashi area about 50.23 sq.km because of hilly area and low agricultural development. Low forest area cover Mohadi about 4.23 because of good agricultural development. The density of forest is more in the especially Western, northwest and southwest. In 2016 had 127.5 sq.km forest areas was decreasing 6.12sq.km Dense forest area was decaling 2010 to 2016 about negative area was 11.02 sq.km. Because the western, north, south, parts under the tribal area and hilly area. Sparse Forest area cover in 2010 about 38.23 sq.km and most area under cover circles was Nanashi about 12.56 sq.km and low forest area Mohadi circles 1.69 sq.km forest area. In 2016 Sparse forest cover area about 38.09 sq.km it means decaling area about 0.14 sq.km because of increasing agricultural area, built up area. Shrubs or Low Forest area

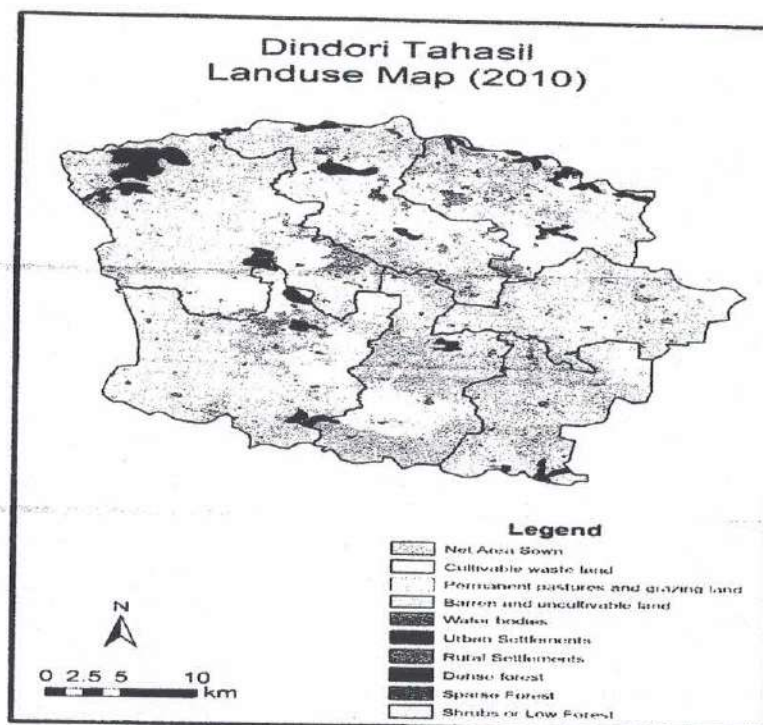


covered study area about 23.08 sq.km in 2010 and 28.14 sq.km in 2016 it means positive change area about 5.06 sq.km because of supported local peoples in tree planation. The maximum area cover circles was Nanashi area about 7.53 sq.km in2010 and 2016 12.13 sq.km because of hilly area and good rainfall position in western side.

## • WATER BODIES:

The area under water bodies was only 53.32 sqk.m in 2001 and 55.78 in 2016 it is positive change in water bodied about 2.55 sqk.m because of government through new developed Dam and tank in western side as well as the farm water storage tanks. Due to location of There are different kinds of surface water bodies in the study area. The maximum water bodies are under Nanashi circles about area 15.41 sqk.m because of western part was hill area and good collection of dam. The low water bodies area Dindoricircles about area 2.1sqk.m.According to 2016 water bodies area more of Nanashicircles area about 15.84 sqk.m and low area under this categories Dindoricircles area about Dindorisqk.m. The maximum water available in western part of study area but this all water benefits in eastern part. Thus eastern part have good agricultural development supportive western part of study area.

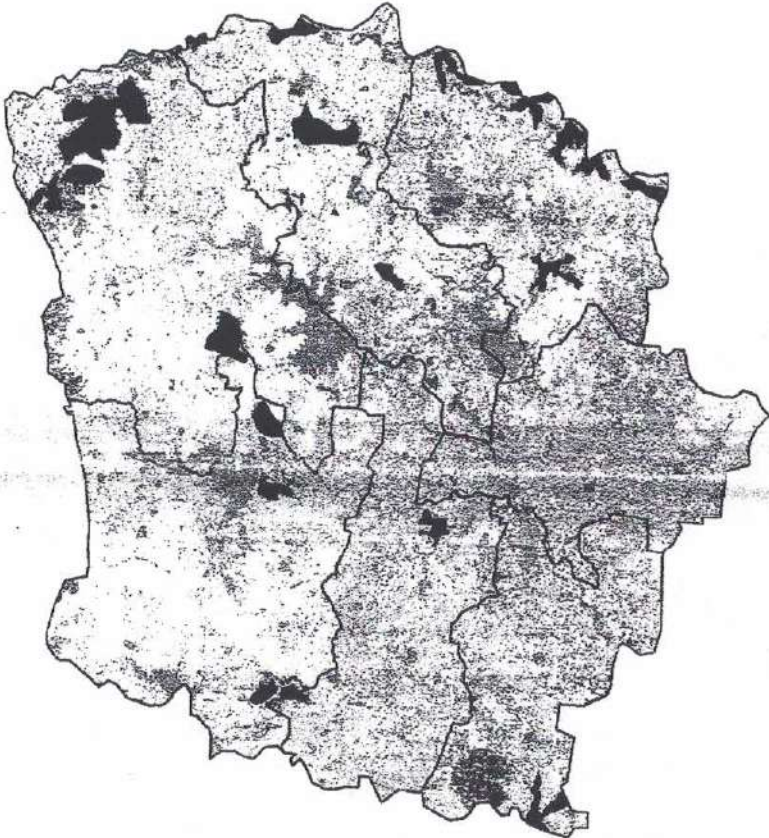
Map No 1.2: Land use in 2010



Map No 1.3: Land use in 2010



Dindori Tahasil  
Landuse Map (2016)



Legend

- Net Area Sown
- Cultivable waste land
- Permanent pastures and grazing land
- Barren and uncultivable land
- Water bodies
- Urban Settlements
- Rural Settlements
- Dense forest
- Sparse Forest
- Shrubs or Low Forest



0 2.5 5 10  
km



Table no1.1: General land use in 2010

land use	Nanashi	Umarale	Koshimbe	Dindori	Kasbevani	Warkheda	Mohadi
Total Agricultural Area	162.06	174.15	126.29	114.84	110.96	125.99	96.09
a. Net Area Sown	96.74	98.25	57.23	53.84	34.71	72.6	55.73
b. Cultivable waste land	47.2	45.67	59.5	46.54	68.19	48.52	38.47
c. Permanent pastures and grazing land	18.12	30.23	9.56	14.46	8.06	4.87	1.89
Non agricultural	52.32	32.5	30.59	33.26	16.56	9.07	30.29
a. Barren and uncultivable land	52.32	32.5	30.59	33.26	16.56	9.07	30.29
Water bodies	15.41	10.1	8.87	2.1	5.83	5.46	5.55
Settlements Urban area	0	0	0	2.59	3.5	0	1.84
Settlements Rural area	5.1	4.36	5.23	5.96	3.2	5.21	3.29
Total Forest	50.23	25.36	21.18	7.19	20.54	4.89	4.23
a. dense forest	30.14	12.93	11.65	2.88	12.73	1.56	0.42
b. Sparse Forest	12.56	8.37	6.78	2.52	4.11	2.2	1.69
c. Shrubs or Low Forest	7.53	4.06	2.75	1.8	3.7	1.12	2.12
<b>Total</b>	<b>285.12</b>	<b>246.47</b>	<b>192.16</b>	<b>165.94</b>	<b>160.59</b>	<b>150.62</b>	<b>141.29</b>

Source: LANDSAT 2010

Table No1.2: General land use in 2016

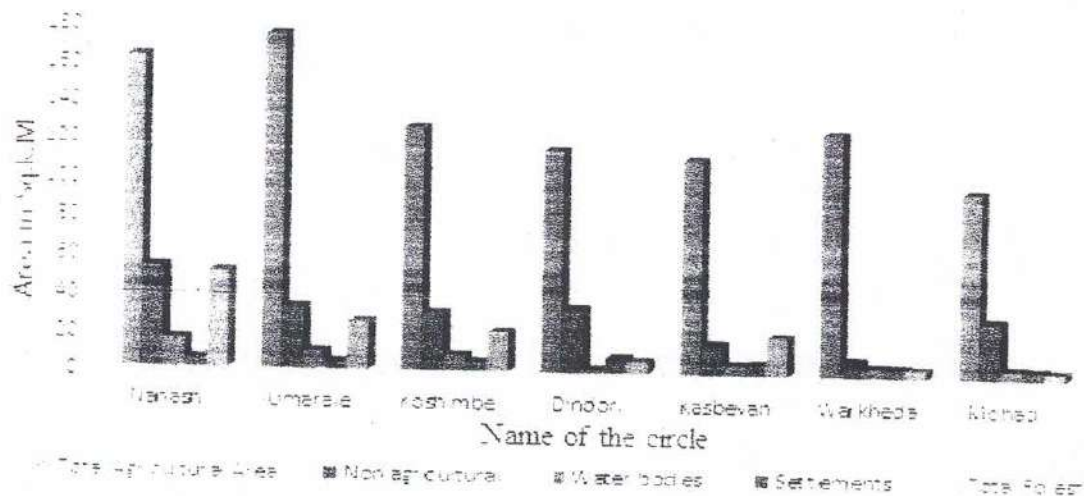
land use	Nanashi	Umarale	Koshimbe	Dindori	Kasbevani	Warkheda	Mohadi
Total Agricultural Area	164.56	174.08	127.39	115.08	113.29	125.82	97.22
a. Net Area Sown	101.23	102.55	63.06	57.5	36.95	78.36	59.47
b. Cultivable waste land	45.6	42.2	56.25	44.53	68.89	43.25	36.25
c. Permanent pastures and grazing land	17.73	29.33	8.08	13.05	7.45	4.21	1.5
Non agricultural	50.1	31.2	29.23	31.96	15.26	9.07	28.45
a. Barren and uncultivable land	50.1	31.2	29.23	31.96	15.26	9.07	28.45
Water bodies	15.84	10.6	9.25	2.9	5.83	5.73	5.72
Settlements Urban area	0	0	0	2.9	3.68	0	2.01
Settlements Rural area	6.1	5.23	6.01	6.87	3.5	5.9	3.91
Total Forest	48.52	25.36	20.28	6.23	19.03	4.1	3.98
a. dense forest	24.26	11.41	11.15	2.37	10.47	1.23	0.4
b. Sparse Forest	12.13	8.88	6.49	2.31	4.76	1.93	1.59
c. Shrubs or Low Forest	12.13	5.07	2.64	1.56	3.81	0.94	1.99
<b>Total</b>	<b>285.12</b>	<b>246.47</b>	<b>192.16</b>	<b>165.94</b>	<b>160.59</b>	<b>150.62</b>	<b>141.29</b>

Source: LANDSAT 2016



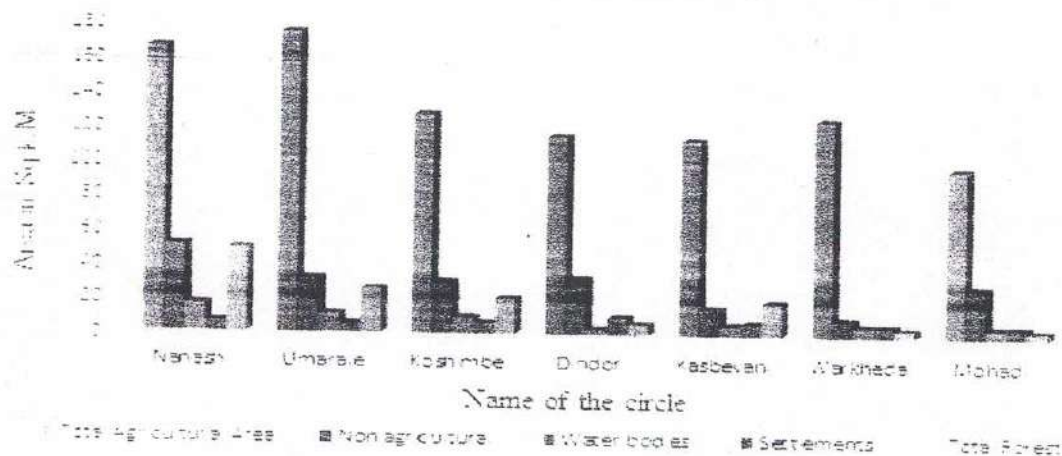
Graph No 1.1: General land use 2010

## GENERAL LAND USE IN 2010



Graph no1.2: General land use in 2016

## GENERAL LAND USE IN 2016



## CONCLUSION

1. The positive growth is observed in built up land, Water bodies, Net sown area, Settlements, low forest and agriculture land.
2. Barren Land and Shrubs or Low Forest land is decreased during the span of 06 years.
3. Dense Forest, Sparse Forest the negative growth in during the span of 06 years.
4. Not good environment conduction/ level of study area because the negative growth in Dense and Sparse Forest.
5. The first positive growth is agriculture land and second rank is dense forest.



6. The data presented in level form have provided an opening to compare the different land use in its spatio- temporal measurement. The found result will be of some help in the whole management and planning of land use / land cover in the Dindori Tahsil Nashik District (M.S, India).

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## **SCHEDULED CASTE POPULATION GROWTH RATE IN NANDURBAR DISTRICT: A GEOGRAPHICAL PERSPECTIVE**

**\*Dr. Vijay. R. Baviskar**  
Head, Dept. of Geography  
B. P. Arts, S. M. A. Sci. & K. K. C. Comm.  
College, Dhule Road, Chalisgaon  
E-mail:- [drvijaykar5@gmail.com](mailto:drvijaykar5@gmail.com)  
E-mail:- [vbaviskar15@gmail.com](mailto:vbaviskar15@gmail.com)

**\*\*Dr. Sachin R. Govardhane**  
Assistant Professor, Dept. of Geography  
S. G. Patil A. S. C. College, Sakri, Dist-  
Dhule  
E-mail:- [sachingovardhane@gmail.com](mailto:sachingovardhane@gmail.com)

### **ABSTRACT**

The Scheduled Caste population belts are specially demarcated the high inclination of growth rate. He present research work is showing the growth rate index of scheduled caste population. The Nawapur and Nandurbar talukas denote highest growth rate index in 1971-81 and 2001-11. The majority of the population is from the scheduled caste population of these tehsils while Akkalkuwa -07.18 (1971-81) & -04.51 (2001-2011) and Akrani (Dhadgaon) (2001-11) -04.51 Taluka observed as the lowest growth rate index.

### **KEYWORDS**

Growth Rate, Growth Rate Index, Fertility, Mortality, Inaccessibility etc.

### **INTRODUCTION**

Population growth rate is a major factor which indicates the past and future of a population. The population growth rate shows the change of population size as a factor of time. The population growth rate deals with the study of the average decadal rate of change of population size. The present research work attempt to study four decadal variation population growths in Nandurbar district. Looking at the population growth during the inter-censal period 1971 to 2011 the growth rate observed between 20 to 40 percent in the census of 1971 and 37.51 to 15.87 percent in the census of 2011.

### **OBJECTIVES**

1. To study the scheduled caste decadal growth rate index of the study region.

### **THE STUDY AREA**

Astronomically Nandurbar district extends between  $21^{\circ} 50'$  to  $22^{\circ} 17'$  North latitude and  $73^{\circ} 31'$  to  $74^{\circ} 50'$  East longitude. The region is bounded by Dhule district on east and south, While on the west by Surat district of Gujarat state and on the north by Badhwani and Jhabua



district of Madhya Pradesh state. The Nandurbar district with a geographical area of 5034.23 sq.km. has an amorphous shape. According to the census, 2011 quantity of urban population is very low with 16.72 percent of total population in the district and 83.28 percent of the total is living in rural areas.

## RESEARCH METHODOLOGY

This study is based on the trustworthy and truthful census data. It is not possible to conduct an individual enumeration of the required data from door to door in the study region. The required secondary data has been collected from the District census handbook (1971-81, 1981-91, 1991-2001 and 2001-2011).

The geographical study of over 40 years i.e., from 1971-2011 has been analyzed for scheduled caste population. For a detailed study of changes in the decadal growth rate index of scheduled caste population of specific talukas. The collected data has been processed and analyzed by using the different statistical technique. The tabulated data has been presented by the figures.

For the measurement of population growth rate index following formula has been employed;

$$GRI = \frac{TPa}{TPb}$$

Where,

GRI= Growth Rate Index

TPa= Total Population of Scheduled caste in 2001-11

TPb= Total Population of Scheduled caste in 1971-81

## RESULTS AND DISCUSSION OF FINDINGS

Fig. no 1.0 shows the trend of decadal growth rate index of Scheduled caste population of Nandurbar district. There is a large variation hence the dominant tribal taluka.

Table No 1.0 Nandurbar District: Growth of Total Scheduled Caste Population 1971 To 2011

Sr. No.	Name of Talukas	Growth Rate Index 1971-81	Growth Rate Index 1981-91	Growth Rate Index 1991-01	Growth Rate Index 2001-11	Change In Growth Rate Index (1971-81 to 2001-11)
1	Akkalkuwa	-07.18	127.63	07.80	-04.51	2.67
2	Akrani (Dhadgaon)	81.95	39.48	36.01	10.38	-71.57
3	Nandurbar	15.28	-21.96	06.22	141.53	126.25
4	Navapur	35.34	-37.36	30.92	192.49	157.15
5	Shahada	67.81	26.65	01.18	37.20	-30.61

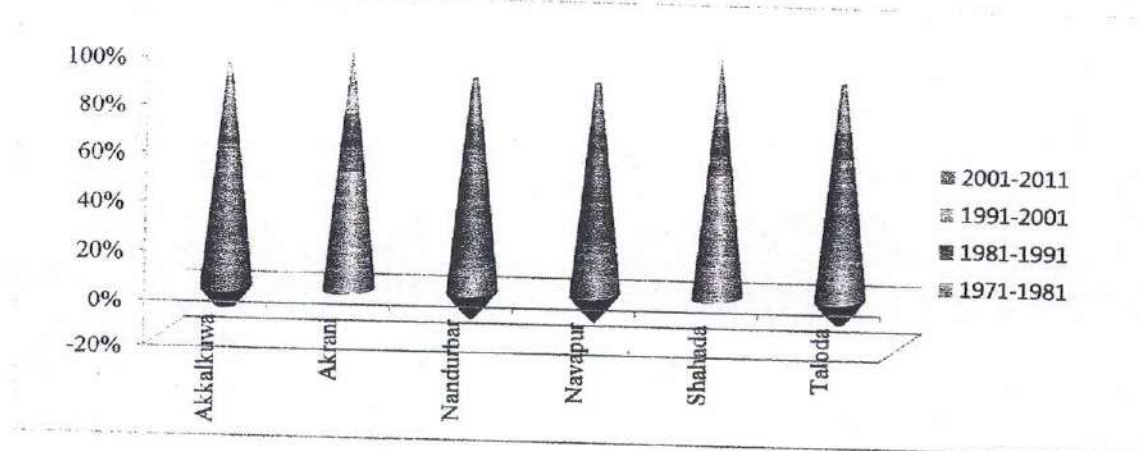


6	Taloda	17.40	-12.44	12.67	73.04	55.64
	Study Region	35.01	07.03	53.62	75.02	39.92

Source: Computed by author.

Table No.1.0 shows the over 40 years i.e. from 1971-2011 has been total Scheduled Caste population in Nandurbar District. In last four decades the total Scheduled Caste population.

Fig. No. 1.0 Nandurbar District: Growth of Total Scheduled Caste population 1971-81 To 2001-2011



Have substantially increased. During 1971-2011 population in the Nandurbar District region has recorded an increase of +162.15 percent, whereas growth rate in a region during 1971-81, was +37.51 percent. Contrary to this during the year, a 1981-91 decrease in the population was 07.03 percent. 1991-2001 increase in the population was +53.62 percent and 2001-2011 this year total Scheduled Caste population is decreasing was +15.87 percent respectively.

During 1971-1981 this period the region's total Scheduled Caste population growth was +37.51 percent. Among the Tahsil of the region, the negative change was recorded in Akkalkuwa Tahsil with -07.18 percent. In the study region, there is a found high tribal concentration in a specific zone. In 1971-81 there are found large variations in the total Scheduled Caste population growth were noticed in Talukas. Among the Tahsil of the region, the highest total Scheduled Caste population growth was found in Akrani (Dhadgaon) Taluka with 81.95 percent followed by Shahada Taluka with 67.81 percent



respectively. Also, the lowest total Scheduled Caste population growth was found in Nandurbar Taluka with 15.28 percent followed by Taloda and Navapur Taluka with 17.40 and 35.34 percent. In the 1971-91 decades due to the epidemic diseases, natural calamities and of droughts the death rate was increased hence negative population growth has been recorded. Correspondingly, 1981-91 in the highest total Scheduled Caste population growth was recorded in Akkalkuwa Taluka with 127.63 percent followed by Akrani (Dhadgaon) and Shahada Taluka with 39.48 and 26.65 percent respectively. The highest negative change was recorded in Navapur Taluka with -37.36 percent followed by Nandurbar and Taloda Taluka with -21.96 and -12.44 percent respectively. In this decade due to the migration, the negative change has been recorded.

During 1991-2001 this period the highest total Scheduled Caste population growth was found in Navapur Taluka with 30.92 percent followed by Akrani (Dhadgaon) and Taloda Taluka with 36.01 and 12.67 percent respectively. In lowest population growth was recorded in Shahada Taluka with 01.18 percent followed by Nandurbar and Akkalkuwa Taluka with 06.22 and 07.85 percent correspondingly. During the period of 2001-2011, the highest total Scheduled Caste population growth was found in Nawapur with 192.49 percent followed by Nandurbar Taluka with 141.53 percent in that order. In lowest total Scheduled Caste population growth was recorded in Akrani (Dhadgaon) Taluka with 10.30 percent followed by Shahada and Taloda Taluka with 37.20 and 70.22 percent respectively. In the negative total Scheduled Caste, population growth rate was recorded Akkalkuwa Taluka with -04.51 percent

According to relevant data and observations, there is found a wide variation of total Scheduled Caste population growth in the study area. Beside that the decadal growth also varies in the 1971-2011 up to 4 Taluka noticed or negative change. In 1971-91 due to the epidemic diseases, natural calamities occur and it's effect on the growth of population. But in 1981-1991 due to the out-migration, the population growth was recorded as negative. Population growth rate is the unifying variable linking the various facets of population ecology thus analyses of population regulation, density dependence, resource and interference competition and the effects of environmental stress are all best undertaken with population growth rate as the response variable.

#### CONCLUSION:

1. The average growth rate index of study region is recorded 37.51 during 1971-81. 07.03



2. The average growth rate index of study region is recorded 07.03 during 1981-91.
3. The average growth rate index of study region is recorded 53.62 during 1991-2001.
4. The average growth rate index of study region is recorded 15.87 during 2001-11.
5. The average change in growth rate index of S. T. population is 39.92 in the study area.

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**\*Dr. Vijay. R. Baviskar**  
 Head, Dept. of Geography  
 B. P. Arts, S. M. A. Sci. & K. K. C. Comm.  
 College, Dhule Road, Chalisgaon  
 E-mail:- [drvijaykar5@gmail.com](mailto:drvijaykar5@gmail.com)  
 E-mail:- [vbaviskar15@gmail.com](mailto:vbaviskar15@gmail.com)

**\*\*Dr. Sachin R. Govardhane**  
 Assistant Professor, Dept. of Geography  
 S. G. Patil A. S. C. College, Sakri, Dist-  
 Dhule  
 E-mail:- [sachingovardhane@gmail.com](mailto:sachingovardhane@gmail.com)



**IMPACT OF COVID-19 PANDEMIC IN INDIAN ECONOMY\***

BY

**Dr. Govardhane Sachin Ranu\***

Asst. Prof. Dept. of Geography V. V. Mandal's S. G. Patil Arts, Science & Comm. College, Sakri,  
Dhule, Maharashtra' [sachingovardhane@gmail.com](mailto:sachingovardhane@gmail.com)

**Dr. Borase Sudhakar Jagannath\***

Asst. Prof. Dept. of Geography, G. E. Society's RNC Arts, JDB Comm. & NSC Sci. College Nashik  
Road, Maharashtra. [borasesudha@gmail.com](mailto:borasesudha@gmail.com)

**Abstract:**

The epidemic of Covid – 19 has spread not only across the country but all over the world and its outbreak is an unprecedented blow to the Indian economy. The Government of India has announced a number of measures to address the situation, ranging from additional funding for food, security and healthcare to sector-related incentives and tax extensions. The long-term nationwide lockdown, the global economic downturn, and the relative disruption of supply and demand chains have left the economy facing a long period of recession and are likely to continue to do so. This study has shown the potential impact of the shock on various sectors such as the manufacturing sector. This research paper seeks to present a set of policy recommendations for financial services, banking, infrastructure, Indian agriculture, real estate, other services and specific sectors.

**Keywords:** Covid – 19, Indian Economy, Varies sectors.

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\*Correspondence Author: Dr. Govardhane Sachin Ranu

**1. Introduction:**

Outbreaks of the corona virus pose a serious threat to billions of people worldwide. In addition to being detrimental to human health, global trade is affecting the entire economic system and trade and commerce worldwide. The first outbreak of the disease occurred in December 2012 in Wuhan, China. The World Health Organization (WHO) is fully monitoring its global threat and thus it is declaring 30 January 2020 as a public health emergency of international concern. The virus began to spread at an unprecedented rate in various countries around the world on March 11, 2020, forcing the WHO to declare it an epidemic, now the whole world is facing this useless and harmful enemy. Many countries are under lockdown and everything has come to a standstill, including normal life, social and social conditions. The first case of corona virus was reported in Kerala on January 30, 2020. As many patients were found in different cities of India, on 24th March 2020, the Government of India declared



a lockdown in every corner of the country and took necessary action. The metropolises of Delhi, Mumbai, Ahmadabad Kolkata, Chennai are densely populated which has given rise to a spurt in cases of covid-19 and these cities are the engines for growth and development of Indian Economy

## **2. Objectives:**

The entire business world is in the cycle of the corona virus. As the virus is having a severe and rapid effect, companies need to come up with appropriate strategies to deal with this difficult situation. Therefore, the objectives of this study are as follows.

1. To understand the impact of Covid – 19 on the Indian economy.
2. To find out the challenges for different sectors in Indian economy
3. To create awareness among the people about impact of Indian economy due to Covid – 19.

## **3. Sources of Research Papers:**

The study is descriptive nature. Secondary Sources such as Books, Research Journals Magazines, Internet and Daily News papers.

## **4. Impact of COVID-19 in Various Indian Sectors:**

Covid-19 has set foot in India and has taken the country into a major crisis. Corona virus disease has become a world-changing phenomenon and is not only a humanitarian crisis but also an economic and social crisis. This affects the business environment and it grows worldwide and many times over. Due to the rapid spread of the corona virus, a number of factors are bound to limit their business operations, which hinders the economic functioning of many industries that contribute to growth. The impact on different sectors of the economy is highlighted below.

### **4.1 Primary Sector:**

Primary sector includes information and manufacturing and raw material related industries. The sector employs about 43.21% of India's population and contributes about 16.1% of Indian GDP. It supplies raw materials to the secondary sector and provides the basic necessities of human life.

#### **4.1.1. Agricultural industry:**

Travel restrictions for lockdowns in the agricultural sector have led to a shortage of agricultural workers, leading to a decline in production. Also, the lockdown period (epidemic) all over the country (or across the continent) is consistent with the harvest season of the "Rabi" crop, but due to the shortage of labor, the crop remained in the field without any problems. The markets for the raw materials used



for this have gone down and so have the complaints of the farmers. The revenue of tea-based industries has declined significantly as most of their production is now being exported.

#### **4.1.2. Mining Industry:**

Outbreaks appear to be exacerbated by the overall demand for metals and minerals all over the country (or continents), which has led to lower rates. Mining firms have also seen their share prices fall sharply.

#### **4.2 Secondary sector:**

The secondary sector employs about 24.89% of the population and accounts for 29.6% of Indian GDP. It embraces industries engaged in the production and distribution of manufactured goods or construction activism, which provides support to both the primary and service sectors.

##### **4.2.1. Manufacturing Industries:**

The manufacturing industries are picking up the brunt of the corona virus as they discontinue their production in a short time. The value of the goods in the production center or warehouse of these industries has come down and the machines have been idle for a long time. The biggest hurdles that industries faces are cash flow disruptions and supply chain disruptions.

##### **4.2.2 Automobile Industry:**

With almost all plants shut and imports being sealed up, there is a steep decline in production and sales of the automobile companies impelling them to declare pay cuts. The situation will be awful even during post lockdown period due to fall in income levels.

##### **4.2.3 Textile and Apparel Industry:**

This industry is workplace for over 45 million people in the country but temporary closure of production units has increased their hurdles leading to lay-offs. The terminations of exports and imports have adverse impact on the spinning mills in India as the exports of fabne, yam and other materials have disrupted.

##### **4.2.4. Pharmaceutical and Chemical Industries:**

These industries are heavily dependent on imports of large quantities of drugs and raw materials from China. Import restrictions also affect these industries.

##### **4.2.5. Electronic Industry:**



The finished goods and raw materials used in this industry are mainly supplied to China. The spread of the corona virus has reduced the good production and sales of electronics and also disrupted the supply chain.

#### **4.2.6. Solar Power Industry:**

Solar power project builders depend on Chinese imports. About 80% of the solar modules and solar cells used in India are from Chinese manufacturers. Thus Indian solar project developers began to face a shortage of raw materials and their stocks were limited.

#### **4.3 Service Sector:**

About 31.9% of the population is employed in the service sector which accounts for 54.3% of Indian GDP.

##### **4.3.1. Tourism and Hospitality Industries:**

Tourism and hospitality is the biggest industry in the corona virus crisis and the most important industry to resume this initiative. The lockdown has hampered the flow of tourists, hitting the tourism and hospitality industries.

##### **4. 3.2. Transportation Segment:**

Outbreaks appear to be exacerbated during this time of year. Airlines, cruise and road cargo operators have been hit hard by border closures and travel restrictions. Some airlines are not even in a position to refund their customers for flights canceled due to lockdown.

##### **4.3.4. Healthcare Segment:**

According to FIICCI, the healthcare department is at the center of this global test. Demand for this specialty has grown significantly as a result of recent corporate scandals. Private hospitals are available to provide the government with all the help it needs.

##### **4.3.5. IT Segment:**

IT segment is reeling under corona virus crisis as there is immense dwindle in global deal activities as well as growth rate. They are downsizing their work force to tussle with the presence scenario.

##### **4.3.6. BFSI Segment:**



Covid-19 has impacted the BFISI department with its annual report on the waste of their business and the increase in their non-performing loans. In this emergency situation, employees as well as operating and technical difficulties were shown by the banks and the lack of agility in the banking and financial system.

#### **4.3.7. Media and Entertainment Industry:**

The corona virus has forced the release of many films to be postponed, shooting has calmed down, and cinemas cannot harm the industry.

#### **4.3.8. Retail Segment:**

The closure of shops and malls that do not sell essential commodities has led to an increase in revenue and a lot of loss of jobs. Retail stores selling essential commodities have increased demand for export-oriented retail shelves.

#### **Conclusion:**

In India, this has not yet begun in a systematic manner and needs to be prioritized along with the steps to address the health crisis. By rationalizing the tax rate or providing a tax rate, the impact of Covid-19 on the Indian economy will be curtailed, perhaps after the implementation of the measures. As for the measures needed to combat the economic impact of the rapidly spreading corona virus, government policymakers need to implement substantial targeted financial, comprehensive economic stimulus and policy rate cuts to help normalize economic policy as the Covid-19 crisis continues. , Probably a challenge for producers I will have to face numerous fronts. Producers will also need to look beyond their own financial consciousness if they need to coordinate closely with the public sector to create the necessary plans for the safety of the people and the turmoil of their work while keeping the lights on in public works. Some will be brown, but austerity measures must be taken to safeguard long-term goals.

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