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A Geographical Study of Crop Diversification in Drought Prone Area of Nasik District (M.S.)

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ABSTRACT

The present research work has thrown limelight on the crop diversification of the drought prone areas of Nasik district of Maharashtra State. The investigation shows that the crop diversification is low in the drought prone areas of Nashik distict while crop diversification is high in the non-drought prone zone. It shows that rainfall, urban centres, economic development etc. affects on the crop diversification. Farmers are using cropping pattern which is supporting to low rainfall.

Author has been employed crop diversification index and studied comparatively for drought and non-drought prone areas of Nasik district. The present investigation devoted to drought prone area of Nashik district. There are six tahsils i.e. Deola, Malegaon, Nandgaon, Chandvad, Sinnar are included in the drought zone. The conclusion of this research work shows that Nandgaon tahsil recorded very low crop diversification only bajra and onion these two crops are grown while Chandwad tahsil produced bajra, onion and fodder crops. The medium crop diversification found in Deola, Malegaon and Sinnar tahsil with four crops where, bajra and maize and onion are the main crops in these tahsil. The highest crop diversification recorded in Yeola tahsil. It harvest six crops i.e. bajra, vegetables, maize, wheat, grapes and groundnut.

Keywords : Drought, Crop combination, Crop Diversification, Scanty Rainfall, Cropping Intensity

I. INTRODUCTION

Drought is a climatic anomaly, characterized by deficient supply of moisture resulting either from sub-normal rainfall, erratic rainfall distribution, higher water need or a combination of all the three factors. About two thirds of the geographic area of India receives low rainfall, which is also characterized by uneven and erratic distributions. On an average, severe drought occurs once every five years in most of the tropical countries, though often they occur on successive years causing severe losses to agriculture and allied sectors. More than 500 million people live in the drought prone areas of the world and 30% of the entire continental surface is affected by droughts or desertification process. The water needs in agricultural sector are going to be very high, as several thousand tons of water is required to produce each metric ton of food grains. Therefore, there is a need for effective monitoring of agricultural drought, its onset, progression and impact on crops to minimize the damages

Drought

Drought is the condition of insufficient moisture supply to the plants under which they fail to develop

and mature properly. If may be caused by soil, atmosphere or both. Drought is a hazard to successful production. It occurs due to various combinations of the physical factor of the environment. Internal water stress in crop lands reduces their productivity.

"Deficiency of available soil moisture which produces water deficits in the plant sufficient to cause a reduction in plant growth"

"Drought is a period of inadequate or no rainfall over extended time creating soil moisture deficit and hydrological imbalances."

Drought prone area

A drought prone area is defined as one in which "the probability of drought year is greater than 20%. A chronic drought prone area is defined as one in which the probability of a drought year is greater than 40%. The criterion described above is useful for a continuous monitoring of the monsoon season. The sum of the seasons rainfall becomes the basis for describing a region under moderate or severe drought. When more than 50% of the area in the country is affected is described as severely affected by drought & when the area of 26 - 50% of the country is affected it is described as an incidence of moderate drought.

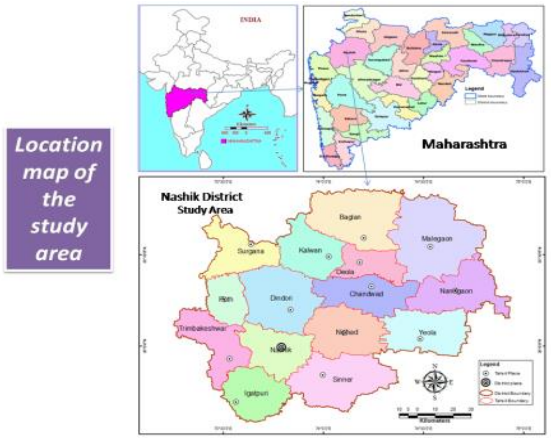
Aims and Objectives

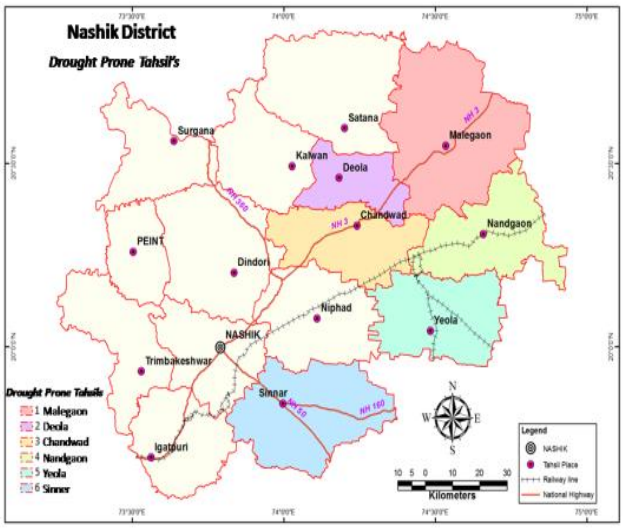
1. To study the Geographical setup of study area.
2. To study the crop diversification of study region.

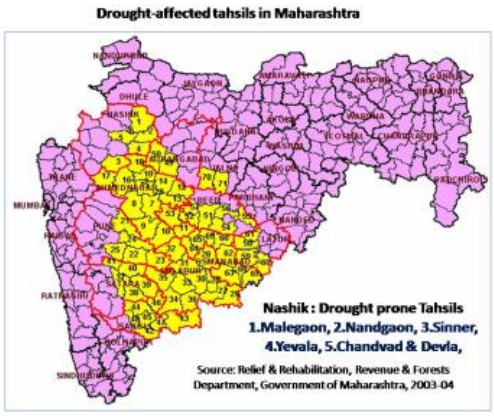
Study Area

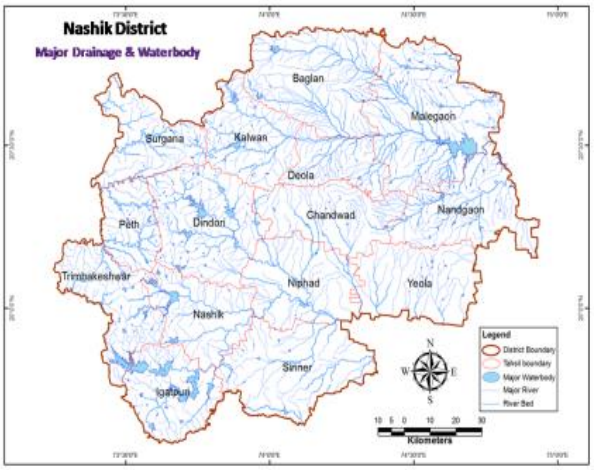
Nashik district is situated in the Deccan trap of Maharashtra which is partly in the Tapi Basin and partly in the upper Godavari Basin. It lies between $19^0 35' 18''$ North latitude to $20^0 53' 07''$ North latitude and $73^0 16' 07''$ East longitude to $74^0 56' 22''$ East longitude. It is surrounded by Dhule district in the North ,Jalgaon and Aurangabad district in the East, Ahmednagar district in the South, Thane district in the South-West and Gujarat state in the North-West(map1.1). Nashik district has an area of 15530 sq. km. and population of 6,109,052, as per the 2011census. There are 15 tahasils and 66 revenue circles are in the Nashik district.

The main stream of hills in the Sahyadri which is runs North-South in the western proportion of the district. From the main Sahyadrian range, three prominent spurs Stretch out of the East. In the extreme north is the Selbari range which approximately forms the boundary between Nashik and Dhule district. Next in the Satmala and Ajanta range which runs right across the district. It acts as a watershed between the Girna and its tributaries which drain towards the Tapi to the north and the Godavari and its tributaries to the south. Some of the ranges are flat topped and regular in height and slope, while others are conical and irregular.









Though average rainfall of the district is between 2600 to 3000mm, there is wide variation in the rainfall received at various blocks. Most of the rainfall is received from June to September. The maximum temperature in summer is 42.5 degree centigrade& minimum temperature in winter is less than 5.00 degree centigrade. Relative humidity ranges from 43% to 62%.

Since last 20 years the grape has acquired dominance on the agricultural economy of the district. Due to water shortage in Kalwan, Deola, Baglan& Malegaon blocks, the farmers have shifted to pomegranate from sugarcane & grape crops. Some progressive farmers are cultivating flowers in green houses. These developments also indicate that the farmers in the district adopt new technologies & methods of cultivation very fast.

According to the report of Relief & Rehabilitation, Revenue & Forests Department, Government of Maharashtra, 2003-04 Sinner, Yeola, Chandwad, Nandgaon, Malegaon and Deola tehsils are declared permanent drought areas of Nashik district.

II. METHODOLOGY

Present study includes data collection, data analysis, map preparation and results. The methodology is adopted to fulfill the objectives of the present study, which can be grouped into two major components viz. fieldwork and laboratory components.

Field work component mostly comprises with collecting secondary data of selected crops from various government offices and rainfall data of the study area. Base map of the study area has been prepared using SOI topographical maps on 1:50,000 scale. DEM of the study area has been generated by contour digitization in GIS environment. The data of crops take into consider for the period of 1991 to 2019. Gross cropped area has been used for the

comparative study. To measure cropping area is calculated in the hector and unit of Average is considered for the present study.

III. EXPLANATION

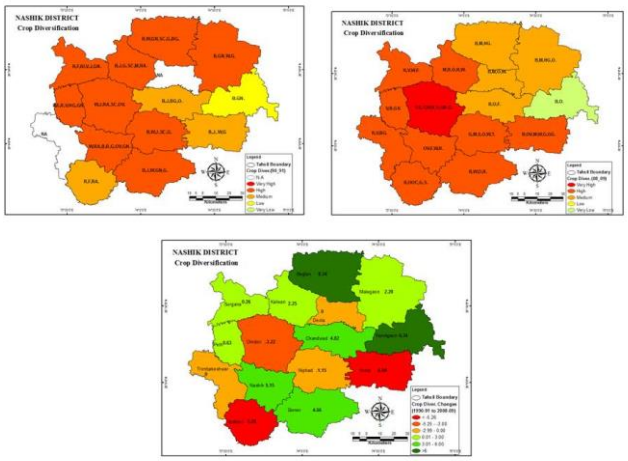
Nashik district is dividedinto two division on the basis of rainfall. The western part of the district is in the high rainfall due to the relief rainfall. This region is in the mountainous area of *Sahyadri*. The eastern part of the district is in the rain shadow zone so rainfall is very low. These two regions characteristics highly influence on the cropping pattern of the study area. The present research work throws limelight on the study of crop diversification of drought areas of study area.

Table.1. CROP DIVERSIFICATION: DROUGHT PRONE AREAS OF NASHIK DISTRICT

Sr. No	Name of Tahsil	1990-91		2018-19		Variation (1990-91 to 2018-19)
		ID	Crops in order	ID	Crops in order	
1	Surgana	13.99	R,F,RI,V,J,GN.	14.25	R,V,W,F.	0.26
2	Kalwan	11.63	B,J,G,SC,M,RA.	13.88	M,B,O,R,W.	2.25
3	Deola	NA	NA	21.07	B,M,O,W.	NA
4	Baglan	14.16	B,W,GN,SC,G,BG,	22.5	B,M,HG.	8.34
5	Malegaon	19.27	B,GN,W,G.	21.55	B,M,HG,O.	2.28
6	Nandgaon	37.21	B.GN.	43.45	B,O.	6.24
7	Chandvad	21	B,J,BG,O.	25.82	B,O,F.	4.82
8	Dindori	12.45	W,J,RA,SC,OV.	9.23	F,G,T,W,R,S,GN,G.	-3.22
9	Peth	16.71	RA,R,V,HG,GN.	17.34	V,R,GV.	0.63
10	Trimbak	NA	NA	19.68	R,V,BG.	NA
11	Nashik	10.25	W,RA,B,R,G,OV,GN.	15.4	OV,F,W,R.	5.15
12	Igatpuri	24	R,F,RA.	18.74	R,OOC,G,S.	-5.26
13	Sinnar	13	B,J,W,GN,G.	17.66	B,W,O,R.	4.66
14	Niphad	16	B,W,J,SC,G.	14.85	G,M,S,O,W,T.	-1.15
15	Yevla	20.58	B,J,.W,G	13.64	B,OV,M,W,G,GG.	-6.94
District		13	B,W,J,G,GN,R.	11.73	B,M,R,W,O.	-1.27

Source: Compiled by Author

Fig. No.1.CROP DIVERSIFICATION: DROUGHT PRONE AREAS OF NASHIK DISTRICT



Crop Diversification in Drought Prone Areas:

1. Very High Crop Diversification- There is no tehsil having very high diversification in drought prone areas of study area. Only Dindori tehsil recorded very high diversification (9.23 according to 2018-19) which is non-drought prone area of Nashik district.
2. High Crop Diversification- According to crop diversification ID of 1990-91 Malegaon (19.27) and Sinnar (13) tehsil are considered in this group. There is Bajra, Ground nut, Wheat and Grapes these crops are grown in rank. While in 2018-19 crop diversification changed of Malegaon (21.55) tehsil transferred in the medium group. Yeola tehsil is converted from medium to high crop diversification group and Sinnar is still in this group. But the change is occurred in the ranking of crops. Maize and onion these commercial crops are grown densely in these two tehsils.
3. Medium Crop Diversification- The medium crop diversification investigated in Chandwad and Yeola tehsil (1990-91) and Deola, Malegaon and Chandwad tehsil (2018-19) accordingly. There was only two tehsils in medium group (1990-91) it transformed in three tehsil and Yeola tehsil converted in high crop combination.
4. Low Crop Diversification- The low crop diversification recorded in Nandgaon tehsil (1990-91) only. Bajra and Ground nut are the prominent crops in these tehsils.
5. Very Low Crop Diversification-The very low crop diversification recorded in Nandgaon tehsil (2018-19) only. Nandgaon tehsil transformed low category to very low category. The crop Ground nut replaced by Onion.

IV. CONCLUSION

1. The very low or low crop diversification recorded in Nandgaon tehsil.
2. The very high or high crop diversification investigated insinnar tehsil.
3. Commercial crops are takes place of food grain crops.
4. Malegaon tehsil converted high crop diversification to medium crop diversification.
5. Yeola tehsil transformed from medium crop diversificationto high crop diversification

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