ISSN 2278-8808 SJIF 2014 = 4.889
An International Peer Reviewed & Referred
SCHOLARLY RESEARCH JOURNAL
FOR INTERDISCIPLINARY STUDIES

PROBLEMS AND PROSPECTS OF AGRICULTURE IN DROUGHT PRONE AREA IN MAHARASHTRA

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Introduction

Maharashtra State has a land region of 3,07,713 sq. km to the North 15°40' and 22°00' and East Longitudes 72°30' and 80°30'. Authoritatively, the State has six divisions with Headquarters at Konkan (New Bombay), Pune, Nasik, Aurangabad, Amravati and Nagpur. The State has further been partitioned into four financial districts to be specific Konkan containing Konkan subdivision, Madhya Maharashtra including Nasik and Pune sub-divisions, Marathwada involving Aurangabad sub-division and Vidarbha involving Amravati and Nagpur sub-divisions. The State has 35 locale and 353 talukas. The State has two urban locale i.e. Mumbai and Mumbai Sub-Urban while the remaining 33 areas are rustic. There are 336 urban areas and towns in the State, out of which 40 have populace more than one lakh. There are 40,785 towns and 45,528 villages. The number of inhabitants in the State is 112.3 million according to 2011 Census out of which 41 million is urban and 55.7 million rustic. Out of aggregate territory of the State, 73 %, i.e., 2.25 lakh, sq. km of territory is cultivable and 17.6 % is under timber

Drought prone area in Maharashtra:

The Deccan plateau constitutes 50 percent of the drought-prone area of the state. 12 percent of the population lives in drought prone areas. Once in 5 years, deficient rainfall is reported. Severe drought conditions occur once every 8-9 years. The 1996 drought affected 7 districts and 266.75 lakh people. The 1997 drought affected 17 districts. In 2001, droughts affected about 20,000 villages in 23 districts; 28.4 million people and 4.5 million hectares of crops in the State. According to a report from the Government of Maharashtra, number of districts affected by droughts in the year 2002-03 and 2003-04 were 33 and 11, respectively. Deficient rainfall in Western Maharashtra and Marathwada regions for successive years has severely affected agriculture in the region, which is the main source of livelihood and employment. The situation of droughts in Maharashtra continued to deteriorate in 2004. Following the failure of monsoon in 2003, the GoM declared droughts in 11 districts namely, Pune, Satara,

Sangli, and Solapur (Pune Division), Nashik and Ahmednagar (Nashik Division) and Beed, Latur, Dharashiv and Aurangabad (Aurangabad Division). Altogether 71 talukas in these 11 districts are seriously affected by the droughts.

Table No. 1 Severely drought-affected talukas in Maharashtra (2003-04)

Sr. No.	District	Talukas
1	Solapur	Barshi, Karmala, Madha, Malshiras, Mangalvedha, Mohol, Pandharpur, Uttar Solapur, Sangola, Dakshin Solapur, Akkalkot
2	Sangli	Jat, Kavatemahankal, Tasgaon, Miraj, Khanapur, Atpadi, Kadegaon
3	Pune	Baramati, Daund, Indapur, Purandar, Shirur
4	Satara	Maan, Khatav, Khandala, Phaltan, Koregaon
5	Ahmednagar	Sangamner, Kopargaon, Shrirampur, Akola, Pathardi, Parner, Shrigonda, Ahmednagar, Rahata, Jamkhed, Shevgaon, Rahuri, Nevasa, Karjat
6	Nashik	Yevala, Sinner, Nandgaon, Chandvad, Devla, Malegaon
7	Beed	Parli, Kaij, Ashti, Patoda, Beed, Shirur, Wadvani
8	Osmanabad	Osmanabad, Tuljapur, Umarga, Lohara, Kalamb, Vashi, Bhum, Paranda
9	Aurangabad	Vaijapur, Gangapur
10	Latur	Latur, Renapur, Ausa, Nilanga
11	Jalna	Ambad, Ghansawangi

Different parts of the nation have drought, which influences farming creation and economy. Long haul precipitation information somewhere around 1901 and 1990 from 90 downpour gage stations of the State were utilized to figure typical precipitation and the negative takeoffs of the yearly precipitation from the ordinary to examine the repeat of dry spell and to outline dry season inclined range of the State. A dry season year is characterized as a year in which the aggregate precipitation got is under 75 % of the typical. The seriousness of dry spell is as fellow: -

S.No	Category	Range
1	Moderate	Rainfall departure between 25 % and 49 %
2	Severe	Rainfall departure between 50 % and 74 %
3	Acute	Rainfall departure beyond 74 %

Dry spell contemplatly demonstrate that a percentage of the zones of the State, where dry season has happened for more than 20% of the years, can be outlined as "dry spell zone'. It is watched that there are three particular ranges, which can be named dry season zones. The primary spreads compelling north-western part of the State including parts of Nandurbar, Dhule, Nasik and Thane areas. The second one is in the northern part of the State covering parts of Akola, Amravati, Wardha and Yavatmal locale. The third and the biggest territory, covers practically whole focal part of the State involving significant bit of Marathwada and Madhya Maharashtra covering parts of Ahmednagar, Pune, Solapur, Sangli, Satara and Kolhapur areas of Madhya Maharashtra and parts of Aurangabad, Jalna, Beed, Parbhani, Hingloi, Nanded and Osmanabad locale of Marathwada. The investigation of dry spells demonstrates that Konkan encounters one dry season in at regular intervals while in Marathwada and Madhya Maharashtra, the recurrence is one dry season in at regular intervals. In Vidarbha, it is one dry season in like clockwork

Rainfall in Maharashtra:

Poor precipitation has influenced all the watering system ventures in the dry season influenced districts of the State. The circumstance has turned out to be greatly troublesome for the general population who are needy upon farming for their business. The live stockpiling in every one of the dams has been going down following 2000 in three divisions viz. Nashik, Pune and Aurangabad. In Nashik division, where just Ahmednagar and parts of Nashik area are influenced, the water stockpiling has marginally enhanced in 2005. In any case, in Pune and Aurangabad divisions, the aggregate water accessible in stores has exhausted considerably. The water stockpiling in Jayakwadi, the greatest dam in Maharashtra, was at a record-breaking low, simply over the dead stockpiling. In other significant dams in the dry spell influenced zones, for example, Bhima, Ujani, Majalgaon and Lower Terna dams, there is no live stockpiling. Not just has the low level of water stockpiling lessened the water for watering system and affected the development; it majorly affects the accessibility of savoring water these locale.

Rainfall in Maharashtra is uneven. While the Sahyadris (Western Ghats) and Konkan receive heavy rainfall (around 2,000 mm), most of this water, which accounts for nearly half the total water available in the state, flows into the Arabian Sea; only 5% of this water is used. The First Irrigation Commission of Maharashtra, constituted in 1962, estimated that only 30% of the total cultivable area of the state could be brought under surface and groundwater irrigation. Until recent years, successive governments have been lethargic in working

towards realizing even this potential. The percentage of gross irrigated area to gross cropped area in Maharashtra in 2002-03 was only 16.4, substantially lower than the all-India ratio of 38.7. The percentage had been about the same a decade earlier.

Table No. 2 Rainfall in Maharashtra

Sr. No.	Station	Average Monsoon Rain Fall (mm)	No. of Rainy days	Maximum Rainfall in 24 hrs.	Coefficient of Variation of Rainfall %
1	Dahanu	1808	65	481	30
2	Bombay	1393	67	548	27
3	Alibag	1804	73	408	25
4	Ratnagiri	2436	73	356	22
5	Harnai	2315	84	212	23
6	Dhule	516	30	152	32
7	Jalgaon	691	41	183	24
8	Nasik	660	41	175	30
9	Malegaon	441	27	159	28
10	Ahmednagar	475	27	177	33
11	Pune	503	36	178	25
12	Solapur	516	31	191	30
13	Satara	827	53	184	26
14	Sangli	359	32	300	31
15	Kolhapur	759	55	198	24
16	Aurangabad	601	37	245	27
17	Beed	553	31	192	32
18	Nanded	779	42	254	31
19	Osmanabad	669	41	247	25
20	Parbhani	705	40	401	38
21	Chandrapur	1111	52	254	24
22	Bhandara	1224	53	307	23
23	Wardha	975	47	241	23
24	Nagpur	1069	50	315	23
25	Akola	685	37	365	25
26	Amravati	742	40	235	28
27	Buldhana	437	42	338	23
28	Yavatmal	925	45	338	23

Around 70 for each penny of Maharashtra area zone is hot semi-bone-dry to parched, supporting farming that is to a great extent subordinate upon rainstorm precipitation. The yearly precipitation in Maharashtra state differs from 400 mm to 6000 mm. The normal yearly precipitation is around 1300 mm. Around 85% precipitation is gotten amid southwest storm restricted to just 3 to 4 months (June to September) of the year. The quantity of stormy days by and large fluctuates from 40 in the lack zone to 100 in the overwhelming precipitation zone. The Deccan level of Maharashtra constitutes half of the dry season inclined zone of the state. 12% of the populace lives in dry season inclined regions. Once in 5 years, lacking precipitation is accounted for.

Extreme dry spell conditions happen once every 8-9 years. As far as seriousness, Western Maharashtra has been the most noticeably bad influenced area, with every one of the areas aside from Kolhapur reeling under the effect of dry season Marathwada, Osmanabad and Beed Districts are all the more genuinely influenced, while in Khandesh, Ahmednagar Districts are inclined to continuous spells of dry spell.

Ground Water Resources in Maharashtra:

The estimation of element ground water assets of Maharashtra has been done for the year 2007-2008 by Ground Water Surveys and Development Agency (GSDA) in a joint effort with CGWB according to the proposals of GEC 1997 Methodology. According to the standards, watershed has been considered as the unit for the appraisal of ground water assets. Every watershed has again been sub-isolated into three sub-units viz; charge, non-order and low quality sub units. The aggregate number of watersheds in the State is 1531, which have been sub-separated into 2405 evaluation sub units (summon 855, non-charge - 1497 and low quality 53).

It has been evaluated that the Annual replenishable ground water asset in the State of Maharashtra is 3.5792 million hectare meter (m ha m) and the Net yearly ground water accessibility is 3.3913 m ham. The aggregate yearly gross ground water draft is assessed to be 1.6997 m ha m and the evaluated Net yearly ground water accessibility for future watering system improvement is 1.5393 m ham. The region shrewd subtle elements of ground water assets are exhibited beneath.

Table No.3 Watershed Development in Maharashtra

Sr.	District	Total	No.	Categorization of Assessment of Sub Units

No.		of watersheds	Safe	Semi Critical	Critical	Over Exploited	Others
1	Ahmednagar	80	53	15	0	12	0
2	Akola	38	36	1	0	0	1
3	Amravati	63	45	8	0	7	3
4	Aurangabad	52	47	4	1	0	0
5	Beed	48	48	0	0	0	0
6	Bhandara	25	24	1	0	0	0
7	Buldhana	57	43	11	0	3	0
8	chandrapur	58	58	0	0	0	0
9	Dhule	45	45	0	0	0	0
10	Gadchiroli	83	83	0	0	0	0
11	Gondia	33	33	0	0	0	0
12	Hingoli	23	23	0	0	0	0
13	Jalgaon	66	40	17	2	7	0
14	Jalna	52	47	5	0	0	0
15	Kolhapur	40	38	2	0	0	0
16	Latur	39	28	4	0	7	0
17	Nagpur	54	51	3	0	0	0
18	Nanded	49	49	0	0	0	0
19	Nandurbar	29	29	0	0	0	0
20	Nashik	80	54	17	1	8	0
21	Osmanabad	41	36	5	0	0	0
22	Parbhani	33	33	0	0	0	0
23	Pune	71	47	16	0	8	0
24	Raigad	17	17	0	0	0	0
25	Ratnagiri	20	20	0	0	0	0
26	Sangli	38	29	4	0	5	0
27	Satara	50	41	8	0	1	0
28	Sindhudurg	11	11	0	0	0	0
29	Solapur	64	51	6	0	7	0
30	Thane	34	34	0	0	0	0
31	Wardha	39	39	0	0	0	0
32	Washim	35	35	0	0	0	0
33	Yeotmal	64	64	0	0	0	0
	TOTAL	1531		127	3	66	4

Remedies:

1) Livestock development: Arid areas are considered to be the best suited for sheep husbandry, which is already an important source of livelihood for a large number of rural people. In semi arid areas the total live stock is pretty large. They are poor milkers hut good drought breeds. However, these cattle and buffalo breeds require further improvement of their potential for production. Sub-humid arid areas also have sufficient livestock resources, but it is their proper use and management that would determine the success of the programme for their development.
2) Drought Prone Areas Programme (DPAP) is the earliest area development programme launched by the Central Government in 1973-74 to tackle the special problems faced by drought prone areas, which are constantly affected by severe drought conditions. These areas are characterized by large human and cattle populations which are continuously putting heavy pressure on the already fragile natural resources base for food, fodder and fuel.
3) Contract farming is encouraged because majority of farmers are marginal and small farmers and they produce mainly for self-consumption rather than market. The development of contract farming will definitely help to change traditional altitude of agricultural producers. It creates ultimately assured market for the products, which in turn creates an incentive in the mind of agricultural producer to produce more output by using modern technology
4) The State has been divided into 1531 watersheds, which have been again subdivided into 2405 sub-units, which form the assessment unit for the estimation of ground water resources.
5) There is little independent research on water-related issues in Maharashtra's drought-prone areas. Some NGOs with requisite expertise and funding do conduct research activities but these are generally limited to their own projects. There is little effort to cover a wider area, with the aim of identifying problems in policymaking and implementation.
6) GOI Department of Rural Development had introduced "Food for Work "in February 2001 as drought relief measure for the employment generation works in the drought affected areas.

7) Working with the people, these drought warriors were expected to raise awareness and mobilize people into action on issues such as:

i. Improper implementation of the state's Employment Guarantee Scheme (EGS), which provides survival income during drought. ii. Abuse of groundwater resources.

iii. Improper functioning of the Public Distribution System (PDS).

iv. Excessive and illegal tree-felling.

8) Deterioration of state-built public water resources such as percolation tanks and hand pumps.

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