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Role of MGNREGS in mitigating impacts of drought in Vaijapur tehsil

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Abstract
Drought is a condition of prolonged absence of rainfall. Drought is a constantly recurring natural disaster of India, with agricultural drought being the most common. MGNREGA is the key scheme to mitigate impacts of drought and to provide employment to its beneficiaries. The average number of monsoon days and average rainfall in mm shows that Vaijapur tehsil is a drought prone area. This research paper discussed status of drought, consequences of drought and drought works completed under MGNREGS. It also analysed the contribution of MGNREGS in the improvement irrigation in drought prone Vaijapur tehsil and beneficiaries participation in water conservation and irrigation works under MGNREGS. This research paper further analysed the impact of various water conservation and irrigation related works undertaken in MGNREGS in Vaijapur tehsil.

Keywords: drought, MGNREGS, rainfall, irrigation, water conservation etc

Introduction

More than 60% of the country's population depends on agriculture and allied activities for livelihood. The occurrence of drought creates social and cultural disruptions across farming households and brings about huge economic losses. It has been well documented that a poor farmer takes three to four years to recover from a drought, depending on the severity. As has been the trend, a severe drought strikes every eight to nine years in India. So, it is a major reason for perpetuating poverty [1]. Drought is one of the most frequently occurring national disasters in India. Drought prone areas are lagging behind in agriculture and also in overall economic growth. Such areas experience wide year-to-year fluctuations in agricultural production and incomes and have a relatively high incidence of poverty. [2] Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA) should have been the key scheme to not only mitigate impacts of drought but also employ people in distress for earning [3].

Rainfall and Irrigation in Vaijapur Tehsil

Table 1.1 shows that average number of monsoon days in Vaijapur tehsil is 33 days and in Aurangabad district as a total it is 47 days. The average rainfall in mm in Vaijapur tehsil is 500.20 mm and 675.50 mm in Aurangabad district. Comparison of average rainfall in Vaijapur tehsil with that of Aurangabad district as a whole shows that Vaijapur is a drought prone area. Tree plantation and water conservation works are required to minimize the adverse effects of drought.

Table 1: Average Rainfall

Area	No. of Monsoon Days	Average Rainfall (in mm)
Vaijapur Tehsil	33	500.2
Aurangabad District	47	675.5

Source: District Social and Economic Survey, 2021 (Aurangabad District)

Table 1.2 shows that in Vaijapur tehsil land irrigated with surface water is 2870 hectors and in Aurangabad district it is 58090 hectors, whereas the land which is irrigated with well/tube well water is 18755 hectors in Vaijapur tehsil and 119351 hectors in Aurangabad district as a whole. The total land under cultivation in Vaijapur tehsil is 166552 hectors and in Aurangabad district, it is 1007131 hectors. The percentage of irrigated land with cultivated land was only 7.57% in Vaijapur Tehsil in 2020-21 and the same for Aurangabad district was 15.88%.

Table 2: Irrigated Land in Vaijapur Tehsil in Hectors (2020-21)

Area	Land Under Irrigation		Total Land Under Irrigation	Total Land Under Cultivation	% of Irrigated Land with Cultivated Land
	Surface	Well			
Vaijapur Tehsil	2870	18755	21625	166552	7.57%
Aurangabad District	58090	119351	177441	1007131	15.88%

Source: District Social and Economic Survey, 2021 (Aurangabad District)

Literature Review

Murugesan R. (2001) studied the history and severity of drought in Tamilnadu. He opined that Water conservation both through water harvesting as well as promoting sustainable agriculture is the only long-term solution to drought and the prevention of the wastage of scarce water resources through ecologically destructive practices. [4] Gautam R. C. and Bana R. S. (2014) analysed the impact of drought in India on agriculture and the mitigation strategies. He further discussed the future actions plans for managing droughts in India. Borkar D. V. (2016) in his research paper emphasized on building Kolhapuri dams for increasing water level in this area Kayadhu of Hingoli district. [5] Jadhav M. (2016) in his article "Water Management Policy of Chatrapati Shivaji Maharaj" focused on the need of Jalyukta Shivar Abhiyaan in drought areas. [6] Mukherjee, Mishra and Trenberth (2018) studied the importance of drought indices in tracking and quantifying drought. He suggested that the performance of drought indicators can be improved by incorporating reliable soil moisture estimates [7].

Statement of the Problem

The average number of monsoon days and average rainfall in mm shows that Vaijapur tehsil is a drought prone area. Drought has multidimensional adverse impacts on agriculture, employment, environment, migration, food scarcity, poverty and economy as a whole. Thus, drought is the key problem of Vaijapur tehsil. The problem of drought requires a sustainable solution. The works undertaken in MGNREGS include water conservation, water harvesting, drought proofing, including afforestation and tree plantation, micro and minor irrigation works, provision of irrigation facility, plantation, land development and land reforms and renovation of traditional water bodies. Such works may help to minimize the severity of deforestation and soil erosion and also the adverse effects of drought. And so, statement of the problem in present study is "Role of MGNREGS in Mitigating Impacts of Drought in Vaijapur Tehsil".

Objectives of the Study

The objectives of this research paper are as follows:

1. To examine the status of drought in India and Maharashtra.
2. To study the multidimensional consequences of drought.
3. To analyse the drought related works completed under MGNREGS in India, Maharashtra, Aurangabad district and Vaijapur tehsil.
4. To study the water conservation works undertaken under MGNREGS and its impact on the drought prone Vaijapur tehsil.
5. To offer useful suggestions to make the scheme more effective and productive.

Research Methodology

Cross-sectional research design is used in the present study. This is a descriptive research in which quantitative method is used. Multi-stage random sampling method was used to select the sample of 320 respondents from the population. In this study both primary and secondary data are used. The primary data are collected through well-structured schedules. Secondary data are collected from various reference books, journals and annual reports of MGNREGA. The collected data were analysed by using descriptive statistics such as frequency, percentage, arithmetic mean and standard deviation and inferential statistics such as paired sample T test with the help of Microsoft Excel 2010 and Statistical Package for Social Sciences (SPSS 27.0).

Status of Drought in India and Maharashtra

According to the data from Drought Early Warning System (DEWS), about 42% of India's land area is facing drought. Andhra Pradesh, Bihar, Gujarat, Jharkhand, Karnataka, Maharashtra, parts of the North-East, Rajasthan, Tamil Nadu and Telangana are the worst hit. These states are home to 500 million people, almost 40% of the country's population. Failed monsoon rains are the primary reason for the current situation. Lower rainfall has reduced water levels in reservoirs across the country. As per DEWS data, about 6% of the land area of the country is currently in the exceptionally dry category and the area in extremely and exceptionally dry categories is 11% of the entire country [8].

Table 1.7 shows the drought years declared by the Maharashtra state government from 2011 to 2021. The highest drought years were faced by Ahmednagar district in Maharashtra followed by Pune, Satara, Jalna, Osmanabad, Buldhana, Latur, Nashik, Dhule, Sangli, Aurangabad and Beed. During 2011-2021 Nandurbar, Jalgaon, Nanded, Parbhani, Hingoli, Nagpur, Amravati and Solapur faced 4 drought years, whereas Akola, Yavatmal, Gadchiroli, Washim, Wardha, Chandrapur and Gondia faced 3 drought years. Bhandara was with the least drought years (2 years) in Maharashtra [9].

Consequences of Drought

Drought has multiple consequences. These consequences can be divided into short term and long term consequences as follows: ‰

1. Short term consequences: These include loss of food and non-food production, loss of employment, shortage of water, fodder and fuel wood, indebtedness and migration.
2. Long-term consequences: These include low investments by farmers, loss of soil moisture and decline in land productivity, low agriculture growth and low development of the region ‰.

Apart from this there is also an adverse impact on macro-economic growth of the region. Frequent droughts tend to result in depletion and degradation of natural resources, which in turn tend to affect life and livelihood of many people. Droughts tend to affect adversely certain social groups like women, children, households belonging to scheduled castes and scheduled tribes, as these groups are already in disadvantageous situation within households or within the society. Drought can be a contributing factor to wildfire. During drought, decreased water levels, warmer temperatures, and soil runoff can lead to algal growth, lower dissolved oxygen levels, and increased turbidity, posing health risks for human and aquatic life.

Drought Related Works Completed under MGNREGS

Drought related works include water conservation and water harvesting, renovation of traditional water bodies, drought proofing and micro irrigation works. In Maharashtra, the total works and the total drought related works completed under MGNREGS are 51099 and 13508. Out of the total works completed under MGNREGS in Maharashtra, 25.55% of works are related with drought. In India, the total works and the total drought related works completed under MGNREGS are 1198666 and 200216. Out of the total works completed under MGNREGS in India, 16.70% of works are related with drought. In Aurangabad district, the total works and the total drought related works completed under MGNREGS are 2602 and 52. Out of the total works completed under MGNREGS in Aurangabad district, 2% of works are related with drought. In Vaijapur tehsil, the total works and the total drought related works completed under MGNREGS are 340 and 11. Out of the total works completed under MGNREGS in Vaijapur tehsil, 3.24% of works are related with drought.

Table 3: Drought Related Works Completed under MGNREGS as on 08/03/2022

Area	Total Works	Drought Related Works					
		Water Conservation and Water Harvesting	Renovation of Traditional Water Bodies	Drought Proofing	Micro Irrigation Works	Total	%
India	1198666	84108	22157	58395	35556	200216	16.70
Maharashtra	51099	1532	288	11192	46	13058	25.55
Aurangabad District	2602	9	0	43	0	52	2.00
Vaijapur Tehsil	340	3	0	8	0	11	3.24

Source: https://nrega.nic.in/Nregahome/MGNREGA_new/Nrega_home.aspx

Impact of Assets Created under MGNREGS on Irrigation in Drought Prone Vaijapur Tehsil:

When the beneficiaries of MGNREGS are asked whether assets created under MGNREGS improved irrigation in drought prone Vaijapur tehsil', 22 (6.9%) of the respondents strongly agree, 161 (50.3%) agree with the statement and 68 (21.3%) showed neutral opinion. While 57 (17.8%) of the respondents disagree with this aspect and 12 (3.8%) expressed strong disagreement. The arithmetical mean of this statement is 3.39 with standard deviation 0.979.

Table 4: Impact of Assets Created under MGNREGS on Irrigation

Response	Assets created under MGNREGS improved irrigation in drought prone Vaijapur tehsil.
Strongly Agree	22 (6.9%)
Agree	161 (50.3%)
Neutral	68 (21.3%)
Disagree	57 (17.8%)
Strongly Disagree	12 (3.8%)

Source: Primary Data.

Participation in Water Conservation and Irrigation Works under MGNREGS

There are various works carried under MGNREGS. When the respondents are asked in which type of water conservation and irrigation related works they participated, their responses are presented in Table 1.5.

Table 5: Participation in Water Conservation and Irrigation Works

Type of Work	Frequency	Percent
Water Conservation	91	28.4
Drought Proofing	137	42.8
Micro Irrigation Works	23	7.2
Renovation of Traditional Water Bodies	69	21.6
Total	320	100.0

Source: Primary Data.

137 (42.8%) respondents/workers were participated in the works of drought proofing, 91 (28.4%) respondents were participated in the works of water conservation and 69 (21.6%) respondents were participated in the works of renovation of water bodies. Only 23 (7.2%) respondents were participated in the works of micro irrigation. This shows that most of the respondents were participated in the works of drought proofing and least in the works of micro irrigation.

Impact of Water Conservation and Irrigation Works under MGNREGS

Table 1.6 indicates the impact of various water conservation and irrigation related works undertaken in MGNREGS.

Table 6: Impact of Water Conservation and Irrigation Works

Impact	Frequency	Percent
Increase in Ground Water Level	81	25.3
Guaranteed Clean and Safe Drinking Water	34	10.6
Increase in Irrigation Areas	150	46.9
Increase in Yield	55	17.2
Total	320	100.0

Source: Primary Data.

When the respondents are asked to give their opinion about the impact of water conservation and irrigation related works they participated under MGNREGS, 150 (46.9%) respondents/workers agreed that there is an increase in irrigation areas, 81 (25.3%) respondents opined that the water conservation and irrigation related works carried under MGNREGS resulted in an increase in ground water level and 55 (17.2%) respondents said that these works resulted in an increase in yield. Only 34 (10.6%) respondents agreed that water conservation and irrigation related works carried under MGNREGS resulted in guaranteed clean and safe drinking water. Thus it can be concluded that water conservation and irrigation related works carried under MGNREGS mostly resulted in an increase in irrigation areas.

Conclusion

The amount of rainfall shows that Vaijapur is a drought prone area. 183 respondents agreed that the assets created under MGNREGS improved irrigation in drought prone Vaijapur tehsil. Most of the respondents were participated in the works of drought proofing and least in the works of micro irrigation. As per the responses of the beneficiaries, water conservation and irrigation related works carried under MGNREGS mostly resulted in an increase in irrigation areas. Though the drought related works are undertaken in MGNREGS, but the percentage of such works to total works was not so impressive. It is necessary to increase the numbers of drought related works so as to combat the problems of drought.

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