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MEASURES AND PROGRAMS UNDERTAKEN TO OVERCOME DROUGHT CONDITIONS IN SOLAPUR DISTRICT

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ABSTRACT

Drought is a period of abnormally dry weather sufficiently prolonged due to lack of precipitation to cause a serious hydrological imbalance and carries connotations of a moisture deficiency for man's use. The chief characteristic of a drought is a decrease of water availability in a particular period and over a particular area. The drought prevalent in the country these days is not due to a single factor. Drought has affected negatively on river flows of water in canals. The present study various programs undertaken by the government of Maharashtra help in building capacity for drought prevention, preparedness, mitigation and management. Attempts are being taken from time to time to overcome the drought conditions of the region and to provide the minimum needs of the population of the district, are undertaken by the state government to implements various programs.

INTRODUCTION

The scarcity of water in any region leads to drought conditions of that region. It is also related with the climatic conditions of the region such as annual amount of rainfall and its spatial distribution.

Therefore, drought is a complex natural phenomenon of short and irregular occurrence of annual rainfall which is linked to climatic factors; biological factors such as the growth period and stage of the vegetation cover environmental factors like site, soil properties and depth and agro-economic factors. In metrological terms drought has been defined as a deficiency in percent of the normal rainfall. Years with 50 percent or less rainfall than the normal are called drought years. According to rainfall drought fall into three district rainfall categories viz. arid, up to 375 mm, semi arid 376 to 750mm, and Sub-humid 751 to 1125 mm. Drought can be also defined with the help of the aridity index, which expresses the annual water deficit in relation to the potential evaporation, transpiration or water need in percent.

$$(Ia = D/PeX100).$$

Where,
I = Aridity index,
D = Diversification from normal rainfall,
PE = Potential evapo transpiration

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Drought will be consequently defined by the departure from the mean of the aridity index. In socio-economic sense, drought is a period of intense economic stress, resulting from growing agricultural unemployment, acute shortage of water and fodder for livestock's and a decline in cropped area. The soil scientists and ecologists have defined the drought in the context of the water balance of the soil and reduction in natural pasturage. To the farmer, the drought is a period during which his normal farms operations are hampered, and the farm production suffers by decline to varying degrees. In the present study, rainfall is used as criteria for identifying the drought conditions.

Climatic factors like temperature, winds and particularly rainfall play an important role in functioning of agriculture in dry farming zone. It has a key position in success of dry farming. Generally, in India the rainfall is scanty, erratic in nature, non predictable and ill distributed. Sometimes, the quantity of rainfall may not be limiting factor, but its distribution and uncertainty are the other two qualities which make the rained farming very difficult.

Conventionally the low rainfall zones having rainfall less than 750mm, per year, adopted as a 'Scarcity Zone'. This standard is used as criteria in the present study. But the differentiation in 'low rainfall or scarcity zone' has only a limited value. It does not account the actual availability of moisture and evapo-transpiration. It is clear that scarcity conditions refer to crop failure due to scanty rainfall. In other words, scarcity conditions are related to crop failure due to moisture deficiency.

The amount of rainfall in the district of Solapur is meager, precarious and unevenly distributed. The climate is usually hot and the potential evaporation is far in excess over of the precipitation. The normal rainfall is less than 575 mm. hence; the region is classified as semi-arid region. For example, at Solapur with annual rainfall of about 525mm, the potential evaporation is about 1800 mm, annually, resorting in deficit of 70 percent.

Rainfall is being a single most important factor in the farming of Solapur district. From about 50 years of available record for Solapur, the lowest rainfall was recorded in 1972 which was about 270mm, in that year. The maximum rainfall of 1727 mm was recorded during 1978. Year to year fluctuations are so much that there is no guarantee of a fixed quantity of rainfall.

OBJECTIVE

Main objective of the present research paper is to measures and programs undertaken to overcome the drought conditions.

Measures and Programs undertaken to overcome the Drought Conditions

Attempts are being taken from time to time to overcome the drought conditions of the region and to provide the minimum needs of the population of the district, are undertaken by the state government given as below:

1. **Soil and Water Conservation:-** The drought prone areas are severally affected by soil erosion and infertility which depletes the capacity to retain moisture in the soil for the required period. Thus, soil and water conservation methods become basic activity

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for any program taken in drought prone areas for sustaining agricultural production, soil conservation aims at improving lands by adopting suitable techniques according to the topography. Contour bunding, Nala bunding and land leveling schemes are undertaken in soil and water conservation measures in drought prone area in several places in the Solapur district.

2. **Watershed Approach:-** The affected areas in the region understudy have adopted watershed approach. A watershed approach is the most effective framework to address today's water resource challenges. Watersheds supply drinking water, provide recreation and sustain life.

3. **Water Harnessing: -** In order to utilize the underground water in the absence of rainfall the water harnessing is carried out by private land holders as well as by government. In respect of percolation tanks harnessing is achieved through digging of wells or bore wells in the down streams of percolation tanks in the field owned by the farmers in various places of the Solapur district.

4. **Dairy Societies:-**Dairy Societies provide milk and its products to the people in the region, accordingly the arrangement have been made for marketing the increased milk production so that the livestock owners receive from time to time the benefit of extra economic returns, for this purpose the program of establishment of dairy societies have been undertaken in the region.

5. **Dry Farming:-** In the region under study the rainfall is irregular and scanty so that dry farming is very important. In 1933, the dry farming research was established in the region. The research station was started with an object to carry out systematic and scientific research on allied aspects of dry farming so as to get reasonable production of Rabi Jawar, Sunflower and important pulses, even under adverse conditions of soil, climate and rainfall. Subsequently, emphasis is given on the production technology of all dry land crops. The research station also provides centre of demonstration for the newly evolved techniques in dry farming to the farmers of drought prone areas of Maharashtra in general and Solapur district in particular.

6. **Fertilizer use under Dry Lands:-** Different kinds of fertilizers are used in dry lands only by a few farmers, in fact there is disbelief amongst the farmers that fertilizers would be harmful in dry lands. Soils of dry land areas falling under semi-arid agro-climatic zone which are low to medium in available nitrogen (112 to 480 Kg per hectare) and phosphorus (10 to 35 Kg average P_2O_5 per hectare) but rich are potassium (250 to 900 Kg. average K20 per hectare). However, it has been proved that fertilizer is important next to moisture in dry lands. In year 1989-90, a sample survey was carried out by the station which revealed that practically no farmer uses any fertilizer in dry lands. Therefore, a use of fertilizers under dry lands has been recommended.

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7. **Cropping System:-**Research on pure inter and sequence crop system is in progress in order to increase the production, some of the important measures have been suggested as under:

    i. **Early sowing of Rabi crops:-**As a measure to correct it, early sowing of Rabi crop has been recommended. This helps to make moisture available for plant growth. It has been found useful for both Rabi Jawar and safflower in the region. On an average of 4 year, Jawar yields have been improved by 30 percent as a additional grain production while 73 percent fodder production has been increasing. For safflower, the yield increase has been found to be of the order of 78 percent over the traditional sowing.

    ii. **Sequence Cropping:-** Rainfall received during June to August is conserved and then Rabi crops are sown. In order to explore the possibilities of growing two crops by using available soil moisture during June to August, sequence cropping is recommended. The sequence of green gram followed by Rabi Jawar or Bajra followed by gram are the best suited in the region under study.

8. **Block Plantation of Private Land:-** In order to increase the fodder productivity of marginal farmers and to enhance the carrying capacity of these land and to put the marginal and sub marginal land in proper land use, a block plantation on private land development program is designed in the region under study.

9. **Farm Forestry:-**To encourage farmers to grow trees of economic value, yielding small timber, fuel wood and fodder for his domestic use a scheme of plantation of trees by individual farmer either on bunds of his farm or on the waste land in the nearby field is undertaken. This has helped farmers in many ways and also prevents soil erosion as well.

10. **Animal Husbandry:-** The drought prone areas are endowed with reputed breeds of cattle and sheep, generally their number is also quite large. However, their milk yield is very low. So it does not help much in diversifying sources of income of drought prone area farmers. Additionally this live stocks population adds tremendously to soil erosion through overgrazing. This in turn has led to critical livestock food supply situation. It is also noticed that in these areas rearing of sheep and goats on organized lines is not only negligible but is positively discouraged. Due to this, the farmers in these areas loose an opportunity to further diversity their sources of income. In this background the objective of animal husbandry and dairy development programs in drought prone areas would be to upgrade the breed of cattle to increase the milk yield to organize marketing of milk on co-operative and scientific basis and to develop sheep goat rearing on organized lines.

11. **Proper Planning of the Crop to Suit the Soil Capabilities:** Proper crop planning according to soil capability is essential in drought conditions. Therefore, lands up to 45 cm. depths need to be diverted for Kharif crops. Shallow soils up to 20 cm. deep

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should be diverted for gross growing and pasture. Such land use planning measures also taken in some parts of the district.

12. **Programs Undertaken:-** The rural work programs was started in 1970-71 as a central sector scheme in selected areas of the district and identified as drought prone. Later it was converted into drought into drought prone area program (D.P.A.P.). It was implemented from 1974-75 as a active program in the identified blocks per district with 50 percent central assistance. About 1.12 lacks hectares of the states area is drought prone and the program covered entire this area. In the first year of the fifth five year plan the World Bank (IDA) in conjunction with the central and state Governments implemented this program in the districts of Ahmednagar and Solapur. At the revised sixth five year plan (1980-85) Government of India, appointed a task force headed by Dr. M.S. Swaminathan, Member of planning commission, to assess the work done by D.P.A.P. The Objectives of DPAP includes the following points:-

1. Restoration of ecological balance.
2. Raising the economic status of the poorer sections of the rural population through measures like improvement in cropping pattern, yields and through supplementary occupation like dairy, fisheries and forestry.
3. Raising the productivity status of the land and water, live stock resources through their optimal use.
4. Soil and moisture conservation including promotion of proper land use practices.
5. Promoting more productive dry land agriculture on the basis of the soil, water, climate resources of the areas.
6. Development and productive use of the water resource of the area.
7. Afforestation including farm forestry.
8. Livestock development including development of pastures and fodder resources.

CONCLUSION

In short, it may be concluded that the Solapur district is a drought prone area. Generally the rainfall is scanty, erratic and not evenly distributed, so the crop cultivation and production is very difficult. The crops are not growing well because of water availability period is very short. In the drought years of 1972-73, the intensity was very high compared to other drought years. Many programs and measures to overcome drought conditions are being undertaken by state government such as Nala Bunding, contour bunding, leveling and shaping water harnessing, block plantation, form forestry, animal husbandry, dairy societies and cropping system. These measures have helped farmers in enhancing the economic conditions to a greater extent in the Solapur district.

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REFERENCES

1.Patil, N. D. and Umarani, N.K. (1981): Improved crop production Technology for drought prone areas of Maharashtra.

2. Government of Maharashtra (1991): Drought pone areas programs.

3. Maharashtra Census office Bombay (1977): Maharashtra State Gazetteer Solapur. District.

4. Ali Mohamad (1978): Studies in Agricultural Geography, Rajesh Publication New Dehil.

5. Bansali, P.C. (1975): 'Agricultural problems of India,' Vikas Publishing House Pvt. Ltd.

6. Majid Hussain (1996): "Systematic Agricultural Geography" Rawat Publication, Jaipur.

7. Rananaware D.D. (2001): "History of Solapur" Ablay Pubication, Sangramnagar, Akluj.