

CHAPTER THREE

DRUGHT AS A FACTOR

3.1 Introduction

3.2 Definition of Drought

3.3 Consequences of Drought

DRUGHT AS A FACTOR

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CHAPTER THREE
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DROUGHT : AS A FACTOR
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3.1 Droughts and Famines have been with us from time immemorial. The hymns in the Rigveda and Several invocations in the Epics contain soul-stirring prayers and ardent entreaties to Varuna-the rain god in particular and his colleagues in general, that shower their beneficence. Some of the oft-quoted verses run as follow :-

"May the rains be timely and the earth bloom with grain".

"The ever true principles of cosmic order alone sustain the balance of Mother Earth."

(Atharva 14.1.1)

--: CHARACTERISTICS OF DROUGHT :-
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Drought is a relative condition (Blair). Hence there is no universally acceptable definition of the term "Drought". Thus Drought has different concepts for different disciplines. However some common features of drought are listed as below :-

- 1) "Drought" term is basically of meteorological origin. It is related to uncertain or erratic rain fall. Hence it is variable both in space

and time. "Higher the variability more is the risk of Droughts." This may be stated as a rule and it is applicable to Akkalkot Taluka.

- 2) Drought is a biological rather than a climatic phenomenon (Landsberg) It ought be defined separately for each plant species and soil environment.
- 3) The scope of agricultural development in these areas is limited. It is of subsistence type. The yields of crops are very low. The percentages of agricultural labour is very high. Hence the rural population is always engaged in a perennial struggle for existence.
- 4) The water table in drought-prone areas is very low. Hence irrigation potential is very much limited.
- 5) Drought-prone areas in Maharashtra are generally associated with low levels of development.

Why is Maharashtra alone?

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-: DEFINITION OF DROUGHT :-
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Many of the definitions of drought are based purely on rainfall status. However all definitions of drought make it clear that "want of rain" lies at the root of all drought situations. Many attempts have been made to define drought, but no acceptable definition has been made to all concerned disciplines. Hence the concept of drought varies from place to place depending upon normal climatic conditions available water resources, activities of a region.

Most of the definitions are of metrological origin, and most of them are based on "Rainfall". Some of them are as below :-

METROLOGICAL DEFINITION

- i) British Rainfall organisation (1936) has defined absolute droughts as a "period of at least 15 consecutive days to none of which is credited a rainfall of 0.1" or more".
- ii) In U. S. A. "A year having less than 85% of normal precipitation; a period of at least 21 days when the precipitation is less than 30% of the normal" is a drought.
- iii) India Metrological Department has defined drought as a situation occurring in any area when the annual rainfall is less than 75% of the normal.

- iv) In European Russia drought is defined as a "Period of 10 days with a total rainfall not exceeding 0.2".
- v) According to Russel the word "Drought" in Australia is used to signify "a period of months or years during which little rain falls and the country gets burnt up, grass and water disappear crops become worthless and sheep & cattle die".

All these aforesaid definitions of drought are based on rainfall as the dominant parameter. However it is not the only factor for drought making. Several other factors, such as temperature wind velocity, sunshine, soil, evapotranspiration, stage of crop growth etc. also interact to produce drought situation. However the role of rainfall is the most significant.

BIOLOGICAL DROUGHTS

- i) Landsberg said that drought is a biological rather than a climatic phenomenon, it should be defined separately for each plant species and soil environment.
- ii) Sastry considered that, "drought begins when plants can no longer recoup water from the soil as quickly as it is lost by transpiration".



- iii) Thornthwaite has also defined drought as a "period of dryness of weather as affects the earth or prevents the growth of plants."
- iv) C. H. M. Van Bavel considered drought to exist on those days when available soil moisture is equal to or less than the needed for satisfactory growth of the dominant crops.

OTHER DROUGHTS

- i) James and Gallegher have emphasised that "drought is an economic situation recognisable in crop failure".
- ii) Drought may be regarded as a period of abnormal dry weather, sufficiently prolonged for lack of water to cause serious hydrological imbalance.

Hence there are as many definitions as there are investigators, yet one common element in all these definition is "the deficiency of water".

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In the light of various definitions of drought their kind and causes, it may be generalised that both Akkalkot taluka in particular and Solapur district in general are in the habit of getting droughts. All the Fact Finding Committees appointed by Government of Maharashtra in various years had declared Akkalkot taluka as a permanent drought prone taluka. This is primarily due to the erratic nature of Indian Monsoon that are well known for their following behaviour pattern :-

- 1) May arrive and depart early
- 2) May bring more or less of rain
- 3) May have breaks in rains
- 4) "Breaks" (Short/Long) may or may not be required.

Fig No. 3.1 has been made to relate man with the drought and famines, because they are interconnected and inseparable.

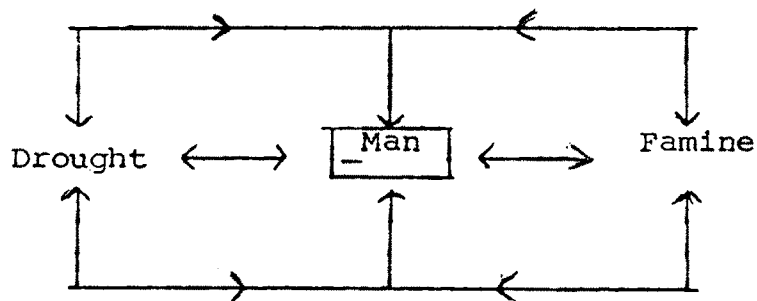


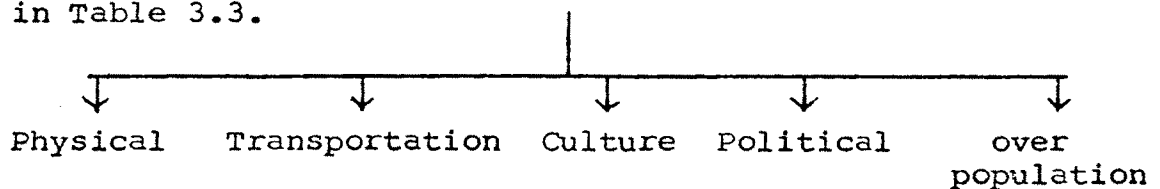
Fig.No.3.1

However some of the high lights of this diagram are as below :-

- i) Man : his numbers, density, population change more specially Migration Patterns and behaviour revolves round droughts.
- ii) Drought :- Various kinds and types are mixed up in the study area. These are related and inter related to famines as well as man.
- iii) Famines are defined in various ways, such as.
 - 1) According to Cecil Woodham-Smith "Famine is nothing more than a great hunger".
 - 2) Deatherage said that "Insufficient food and malnutrition are a way of life for large number of people."
 - 3) Hardand explains "Crop failure means starvation and death."

Famines carry emotional overtones and very few professional geographers have worked on famines. But These are natural as well as man-made.

William A Dando has identified 5 basic famine types in his "The Geography of Famine". These are as in Table 3.3.



- i) Great Durgadevi Famine :- Began about 1396 A.D. and lasted for 12 years, caused by failure of mansoon spread to the south of Narmada.
- ii) Damaji Pants famine : it was recorded in 1460.
- iii) The famine of 1520 was caused by military action.
- iv) The famine of Karnataka, was very sever caused in 1791.
- v) In 1802 the plunder and destruction of crops by Holkar and the Pendharies caused a serious scarcity.
- vi) In 1824 a failure of rain caused a partial famine in Bhīma Basin.
- vii) In 1832-33 want of rain caused famine throughout solapur and neighbouring districts. Many people left their lands and houses. This famine was lasted for nine to ten months.
- viii) In 1878 the Scantly rainfall of 9-11 inches compared with an average of 25-21 inches led to failure of crops and distress amounting to famine over the whole of the district cattle were sent away in large number and of those that remained many died from want of fodder many villages were deserted.

- ix) Famine occurred in 1896-97 due to the failure of crops in the affected tracts from the want of seasonable rain.
- x) During 1923-24 scarcity conditions prevailed in the district. During 1924-25 the relief measures undertaken in 1923-24 had to be continued during 1924-25.

Similarly famines were occurred during 1936-37; 1939-40; 1941-42; 1945-46; 1946-47 1952-53; 1953-54; 1954-55; 1965-66; 1970-71 1971-72; 1983-84.

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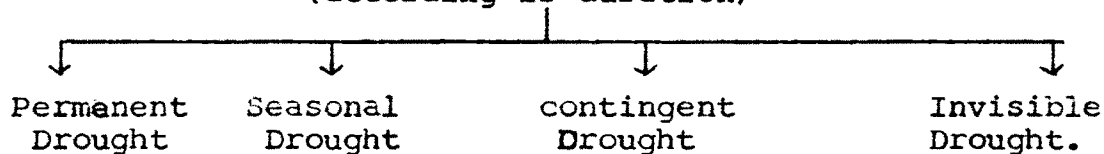
K I N D S O F D R O U G H T S
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- 1) Basically there are four kinds of droughts,
according to duration (Table No. 3.1)

T A B L E N O . 3 . 1

D R O U G H T
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(according to duration)



1) PERMANENT DROUGHT ::- It is a characteristic of arid climates in which the sparse vegetation is adapted to the severe water shortage, and crop culture is impossible without artificial irrigation. In regions of permanent drought stream flow is absent. There is no runoff except locally when a rain occurs.

2) SEASONAL DROUGHT ::- Seasonal drought is found in climates that have well-defined rainy and dry seasons. This is found in semi-arid and sub-humid regions, of these the sub-humid regions are the border line climates which are always susceptible to severe and sudden fluctuations in water balance. Stream flow is periodic, all but the longest streams may become completely dry during the dry season.

3) CONTINGENT DROUGHTS :- It results from the fact that rainfall is irregular and variable every where. They are due to the accidental failure of rainfall and are not certain to occur in any definite season but they are most probable in summer when water needs of plants are greatest. They are usually brief and irregular and may affect a relatively small area. They vary greatly in intensity and time of occurrence and cannot be anticipated.

4) INVISIBLE DROUGHTS :- This can also be recognized even when summer showers are frequent. They may not supply enough water to restore that lost by evaporation and transpiration. The result is a border line water deficiency that cuts crops yields to a small fraction of the potential.

Drought is the most serious physical hazard to agriculture in nearly every part of this district. Since both precipitation and the demand for water by crops vary from one year to another there is a similar great variation in the magnitude of drought.

Now-a-days the Palmer drought Index is used by the weather Bureau of U.S.A. for classifying the intensity of droughts. For the severity of drought he has taken the difference between the actual precipitation and that required to meet the demands of evapotranspiration.

Table No. 3.2 gives his classification according to intensity of droughts. This intensity of drought bears a direct relation with the migrants both as a phenomenon and as a process.

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T A B L E N O. 3.2
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INTENSITY OF DROUGHTS

(By Palmer Drought Index)

S No.	Class	Index Value
1.	Mild drought	-1 to - 1.99
2.	Moderate drought	-2 to - 2.99
3.	Severe drought	-3 to - 3.99
4.	Extreme drought	more than - 4.

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In the light of various definitions of drought it is difficult to find out the causes of droughts. Nevertheless it is true, that droughts are related with "Short and long Spells" of deficient rainfall. However according to different scholars, some of the causes are as below :-

- 1) Tannehill found that solar variation is related with the distribution of rainfall. The distribution of rainfall is not a fixed element of climate, it is a variable determined by the broad controls of sun, atmosphere, continents, and oceans.
- 2) In India & Maharashtra rainfall occurs during the normal flow of SW Monsoon. Its intensity, duration, & span changes in relation to space and time. Thus partially some parts are affected by droughts.
- 3) In Arid & Semi-arid climatic zone, soil moisture plays an important role for determining the existence of drought & it is estimated on the basis of water Balance, for calculating Aridity Index, Humidity Index, Moisture Index etc. (Dr. Zambre & Prof. M. G. Bhasin has worked out the water balance for Solapur.)

Taking all factors of causes into consideration it is very difficult to identify, measure and explain the causes of drought from the other parts of the regions or World because the whole circulation of the earth's atmosphere is linked up in one system. So no clear cut causes of the droughts in the state of Maharashtra or India can be precisely stated.

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-x-x-x-x-x-

-x-x-x-

-x-

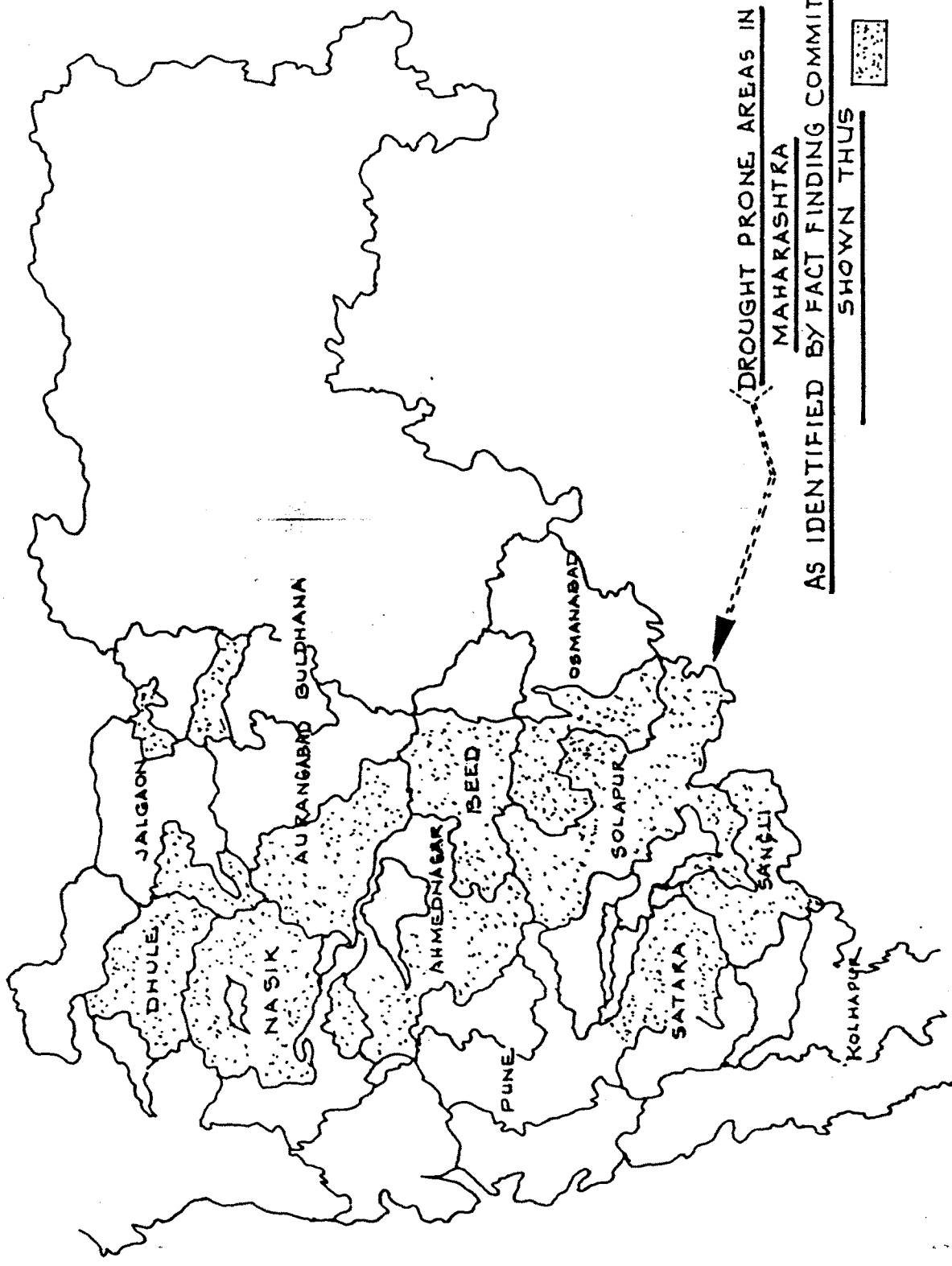
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-:: PREVALENCE OF DROUGHTS IN MAHARASHTRA ::-
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Drought-Famine-Migrations have been unique in Maharashtra since independence. The author in his study finds that government of Maharashtra has shown its interest and involvement in the famines by appointments of Fact Finding Committees after each severe drought (Table No. 3.4).

TABLE NO. 3.4

Sr.No.	Drought year	Name of the Committee	Areas affected	People affected.
1)	1952-53	Pardasni Committee (1960)	Ahmadnagar, Jalgaon, Dhule, Nasik, Pune, Sangle, Satara, Solapur, Thane (5281 Villages)	5 Million
2)	1965-66	(Follows the Report of Pardasni Committee)	23 districts out of 26.	13 Million
3)	1970-73	Sukhatankar Committee (1973)	25488 Villages out of 35800	30 Million
4)	1984-85	Dr. Subramanyam Committee (1987)	23410 Villages out of 35800	28 Million



DROUGHT PRONE AREAS IN
MAHARASHTRA
AS IDENTIFIED BY FACT FINDING COMMITTEE
SHOWN THUS



The Maharashtra State was in acute, severe drought in 1984 (Map 3.1). This calamity, effected over half the state's rural population, sixty percent of the 300 talukas in the state comprising nearly 17,000 villages were experiencing scarcity the population affected by it was 19.4 million people & 8.1 million heads of cattle.

In Solapur district and specially in Akkalkot taluka. The deficit in the south west monsoon of 1984 was more than 40%. The resultant lack of moisture harmed much of the Kharif crop. The insufficient rainfall also had its impact on storage of water. Maharashtra government had estimated that 70% of the Kharif crops had been damaged.

1) As in most such droughts landless labours and small farmers are the worst hit. The biggest problem in the ensuing months to be first that of drinking water for the villages in many villages. Secondly of fodder for the cattle. In many villages women have to trudge three to four kilometers to fetch water and no one knows when even these distant wells may dry up.

2) Land less labours and small farmers were in search of employment owing to the failure of there subsistance crop. In this context it was worth noting that the produce of subsistance

cereals was more adversely affected by drought.

- 3) Even during the monsoon months the cattle had a lean emaciated look. If one wished one can count all the ribs of the cattle.
- 4) These are not stray cattle but the prized possession of the poor villagers who cannot buy animal feed while there was no grass left anywhere to graze. This was the condition everywhere in this entire taluka and district.
- 5) The agricultural labour force swelled by the influx of small and even medium farmers had virtually no local avenues for employment owing to the failure of the kharif & Rabi crops even if some employment opportunities were available, usually through migration to the canal and river irrigated tracts the wages received were lower than normal owing to the excess availability of labour.
- 6) In reality, nobody was earning more than Rs. 7 per day and that too in some cases, According to the table No. 3.5.
Apart from the uncertainty of employment and low wages. The rural poor's finances were squeezed from the other side too. According to the Maharashtra government Fact Finding Committees report prices of food items spurted by as much as 150 points.

WAGE RATES IN TALUKA

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in Rupes? Is it per day/per week/per what?

Month	Year	Skilled Worker			Unskilled Worker			
		Carpenter	Blacksmith	Mochi	Agriculture M F	Other Labour M F		
January	82	12	10	10	6	4	6	4
	83	12	10	10	6	4	6	4
	84	20	20	15	7	5	7	5

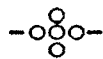
February	82	12	10	10	6	4	6	4
	83	12	10	10	6	4	6	4
	84	20	20	15	7	5	7	5

March	82	12	10	10	6	4	6	4
	83	12	10	10	6	4	6	4
	84	20	20	15	7	5	7	5

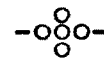
April	82	12	10	10	6	4	6	4
	83	12	10	10	6	4	6	4
	84	20	20	15	7	5	7	5
May	82	12	12	10	6	4	6	4
	83	13.50	12.50	11	6.50	4	6.50	4
	84	25	20	15	7	5	7	5
June	82	12	10	10	6	4	6	4
	83	17.50	15	15	8	4	8	4
	84	25	20	15	7	5	7	5
July	82	12	10	10	6	5	6	5
	83	20	20	15	8	5	8	5
	84	25	20	17.50	7	5	7	5
August	82	12	10	10	6	5	6	5
	83	20	20	15	8	5	8	5
	84	25	20	15	7	5	7	5

September	82	12	10	10	7	5	7	5
	83	17.50	17.50	12.50	8	5	8	5
	84	25	17.50	15	7	5	7	5
October	82	12	10	10	6	5	6	5
	83	17.50	15	12	8	5	8	5
	84	25	20	17.50	7	5	7	5
November	82	12	10	10	6	5	6	5
	83	20	15	15	8	5	8	5
	84	25	20	17.50	7	5	7	5
December	82	12	10	10	6	5	6	5
	83	20	17.50	15	8	5	8	5
	84	25	15	17.50	7	5	7	5

Year?



R E F E R E N C E S



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- (1) Dr. A. Ghosh "Drought Rajasthan Scenario:
Economic and Political Weekly Aug 22 (87).
- (2) Banerji's and Chhabra B. M.
"Drought Conditions in the Telangana Division
During S. W. Monsoon. National geographer
Vol 14 No. 4 June 1963 P 403.
- (3) Desai B. N. and Rao Y. P. "condition for normal
summer monsoon Rainfall and causes of Droughts
over western India" I.J.M.G. Vol 24 No. 4 (1973)
P. 131.
- (4) Economic and Political Weekly Vol XX No. 3
January 1985.
- (5) Encyclopedia Britanica Vol 7.
- (6) Fact Finding Committee's Report (1987)
- (7) Krishnan A "Agroclimatology of Arid and Semi arid
zones of India" Bellary Bijapur and Rayalseema
tracts" Geographical Review Vol 30 (I)
- (8) Mallick A. K. and Govinda
"The drought problems in India in Relation to
Agriculture Vol 1 No. 1 (1962).

- (9) M. G. Bhasin "Drought A Geographic Appraisal
(pp 11-12) The Deccan Geographer Vol XI Jan-Dec.73.
- (10) Dr. Patil C. B. "Seasons" in Maharashtra"
unpublished paper.
- (11) Subrahmaniyam V. P. (1969)"Some Aspects of
Drought Climatology of the Sub-Humid Zones of
South India" I.J.M.G. 7(3) (P 303).
- (12) Tapeswar Singh "Drought Prone areas in India"
pp (62-70).
- (13) William A Dando "The geography of Famine."

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