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6-1-1994

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Kailasa Nathan, K., "Drought Profile: Haryana State in North India" (1994). *Drought Network News (1994-2001)*. Paper 56.
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Drought Profile: Haryana State in North India

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Haryana state is considered the breadbasket of India, along with the Punjab state. The effects of drought (and mitigation of those effects) are therefore of considerable importance for the state. This article considers the state's drought "profile" through a study of six drought years in Haryana.

Haryana has a semiarid climate in the southwest and a Gangetic plain environment in the rest of the state. About 50% of the state has a moisture deficit. One of the reasons for adverse crop production in the state during June–September is the early withdrawal or late onset of monsoon rains, which contribute nearly 80% of the state's annual rainfall. The monsoon rain during June–September ranges from 284 mm to 521 mm in the drier western and southern plains and from 333 mm to 721 mm in the eastern districts of the state. The normal value during the period is 601 mm. Figure 1 shows the rainfall pattern during the kharif crop growing season (June–September) for the period 1977 to 1989. Out of 15 years, about 6 drought years have been identified: 1979, 1981, 1982, 1986, 1987, and 1989. The minimum deficit was 193 mm (1982) and the maximum rainfall deficit was 437 mm (1987) from the normal seasonal rainfall. Dependable precipitation at 75% level of probability is also depicted in Figure 1. Out of 12 districts in the state, 4 are drought-prone. The main problems with agricultural drought in this region are erratic rainfall; poor soil fertility; and limited, poor-quality irrigation water. Table 1 shows rainfall amounts and crops cultivated in the drought-prone districts of Haryana. Invariably, bajra, jowar, and maize crops are grown in the drought-prone districts in the monsoon season, whereas wheat, barley, mustard, and gram are grown with irrigation during the winter season. These winter-season crops are called *rabi* crops.

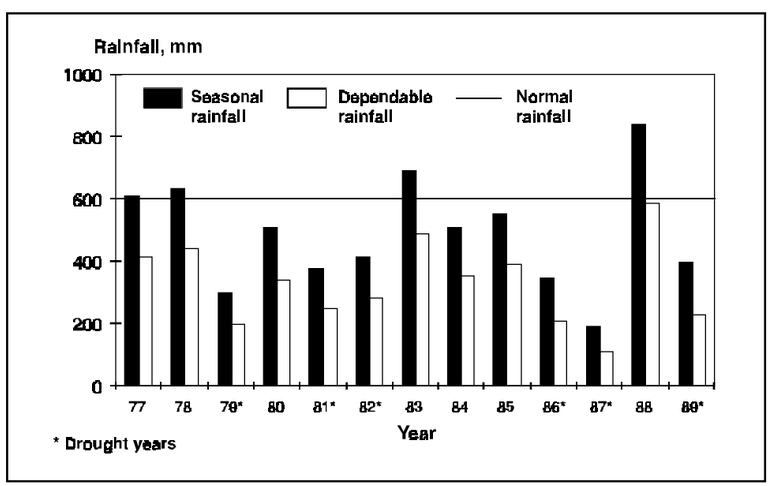

Figure 1. Seasonal rainfall (June–September) and dependable precipitation (75% probability level), Haryana.

In the agroclimatic east zone, farming uses rainfall supplemented by good-quality canal water and brackish water. In the agroclimatic west zone, the common practice is rainfed farming with limited canal irrigation, tubewell irrigation, and irrigation with brackish water. Moisture conservation is a problem and salt accumulation in the soil is common.

For the period 1977–91, six years (1979, 1981, 1982, 1986, 1987, and 1989) are under study in this paper, with special diagnosis of the 1987 drought. Chronologically, 1977–78 seasonal rainfall was near normal in the state, but the winter wheat and oilseed crops in the districts of Bhiwani and Mahendargarh were damaged. The drought was severe in 1979, when a dry spell prevailed for more than 6 weeks (July–August), followed by a moderate drought in September. It is estimated that nearly 75% of the crops were damaged, amounting to losses of Rs. 125 crores in the kharif season.

Mild drought in 1981 resulted in stunted growth of paddy. Kharif production was 20–25% below average. In 1982, the drought was severe in September and October, particularly in the districts of Bhiwani, Gurgaon, Hisar, Mahendargarh, and Rohtak, because of the early withdrawal of rains. Paddy production was down by about 300,000–400,000 tons because of the drought. Of course, in 1986 and 1987, India experienced severe drought. During September and October 1986, the entire state of Haryana was hit by a drought. Crops like bajra, sugarcane, paddy, and pulses, worth a total of Rs. 100 crores, were damaged. In 1987, the drought situation was at its worst from June to August. Paddy sowing was done in only 40% of the area of Haryana. The 1987 drought affected 6,351 villages with a total population of more than 9 million, more than 1.4 million ha. cropped area, and more than 5 million cattle. For drinking water alone, Rs. 3.70 crores assistance was given by the Indian government.

A compensatory crop production program was initiated during the 1987 drought. This program involved irrigation at critical stages of crop growth, balanced and efficient use of fertilizers, and so forth. To provide gainful employment to the landless and vulnerable sections of society in the drought-affected region, the government of India allotted Rs. 15 crores for an employment generation program. Under drought relief measures for cattle conservation, a sum of Rs. 8 crores was approved. A case study of the 1987 drought in the state reveals that the total damage to the crops was Rs. 702 crores. District-level disaster advisory committees were set up for drought watch and relief measures.

Districts	Annual Rainfall mm	Major Crops Grown	
		Kharif	Rabi
Bhiwani	415.0	Jowar, rice, maize, and bajra	Gram, wheat, and barley (with irrigation only)
Gurgaon	634.5	Jowar and maize	Mustard and wheat (with irrigation only)
Mahendergarh	472.9	Bajra, jowar, and maize	Wheat, barley, and gram
Rohtak	434.0	Jowar and bajra	Wheat

Table 1. Annual rainfall and crops cultivated in drought-prone districts of Haryana.

During the same period, contingency plans for drinking water supplies to nearly 6,000 villages were formulated. The government of India sanctioned Rs. 5.15 crores for this program and Rs. 7 million for rigs. To make fodder available in the drought-affected area, Rs. 5.9 million was sanctioned as a revolving fund for purchase and distribution of fodder to the cattle. In addition, the government of India sanctioned Rs. 4.70 crores as a fodder subsidy apart from Rs. 4 million from the state budget. Contingency crop planning was undertaken and fodder and seed kits were distributed to the farmers. The state asked the central government for Rs. 55.59 crores toward subsidy for seed, fertilizers, plant protection, minor irrigation, soil conservation, and so forth.

Fodder was provided to all cattle, including stray and migrant, from adjoining states. Special cattle camps were arranged by the animal husbandry department to fight animal diseases. Central and state government provided Rs. 5 million and Rs. 500,000, respectively, to distribute essential drugs and medicines for the public health facilities.

The drought profile of the state of Haryana shows the need for increased economic and social research on the effects of drought. Plans should be formulated to achieve long-term goals and not merely to fulfill short-term benefits.

This article appeared in the June 1994 issue of ***Drought Network News****.*