



IMPACT OF FLOOD ON AGRICULTURE IN UPPER KRISHNA BASIN OF MAHARASHTRA

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Introduction:

Incidences of natural hazard are increasing day by day in the world. Flood is a situation when there is flow of water in a river more than its capacity and the water overflows the levees and spreads in nearby areas (Gujar, 2008). A total of 3.50 per cent area of the world is affected by floods, while it is inhabited by 16.50 per cent population (Gujar 2008). With the help of past experience future planning becomes very perfect. In this attempt researcher has studied the causes and effects of flood natural hazard in study region considering historical perceptiveness.

In India, there are number of floods occurrence due to physical and climatic setup. Floods have been recurrent phenomenon in India and over 40 million hectares of land is prone to floods (Gautam, 2007). Maharashtra is one of the states of India, where floods frequently occur. Due to the physiographic and climatic condition Maharashtra shows controversy

in the respect of floods. After 1960, there are more than 40 floods are occurred in Maharashtra state. Remarkable floods have been observed in the basins of Godavari, Tapi and Krishna.

Objective:

To study the causes and agricultural impact of flood disaster in upper Krishna basin of Maharashtra.

Floods in Upper Krishna Basin:

In the upper Krishna basin western tahsils are known as flood prone tahsils. Overall study region 13 tahsils out of 29 tahsils are flood affected and out of these tahsils some tahsils are affected by Krishna, Koyana, Warana and Panchganga river. As per record 16.05 per cent of the population lives in flood prone areas with the major rivers Koyna, Krishna, Venna etc. in which flood comes at least once in a year during the monsoon.

Table no. 1.1 shows the flooded rivers and its impact on village-wise population of upper Krishna basin. The river Krishna Koyana, Warana and Panchaganga affected in study region, the statistical data shows that in 2005, more than 23.89 lakh populations of 228 villages become a victim. In the same year Sangli district shows that Krishna and Warana played major role in flood period. The

water volume of these rivers is increased as compare to water volume of Satara district. Therefore, 81 villages and their population were mostly affected and Satara district it was found that 1.19 lakh population of 16 villages and 131 villages (15.55 lakh population) of Kolhapur district came under the influence of flood water (table & fig. 1.1).

Table 1.1: Flood Affected Villages in Upper Krishna Basin (2005)

Name of the River	District	No. of Villages	Affected Population
Koyana	Satara	07	14262
Krishna	Satara	09	103665
Krishna	Sangli	66	698728
Krishna	Kolhapur	25	150243
Warna	Kolhapur	16	97637
Warna	Sangli	15	72840
Kadavi	Kolhapur	02	6888
Kasari	Kolhapur	06	6504
Kumbhi	Kolhapur	17	24232
Bhogavati	Kolhapur	17	50453
Panchganga	Kolhapur	29	1073638
Dudhganga	Kolhapur	12	52496
Vedganga	Kolhapur	07	21125

Source: Based on Krishna River Flood Report, 2005.

Release of excess water from the dams in the major rivers, heavy rainfall and the villages lying in or close the river course are the causes of flooding particularly in the Patan, Satara, and Karad tahsils. The Koynanagar dam on the Koyana river has contributed to reducing the vulnerability of many villages in Karad

tahsil to flooding. In Kolhapur district there is a large number of river along villages (188) which are prone to floods. High floods generally occur due to heavy rainfall in catchment area of major dams and release of excess water. Past records show that comparatively high floods occurred in 1989 and 1994.

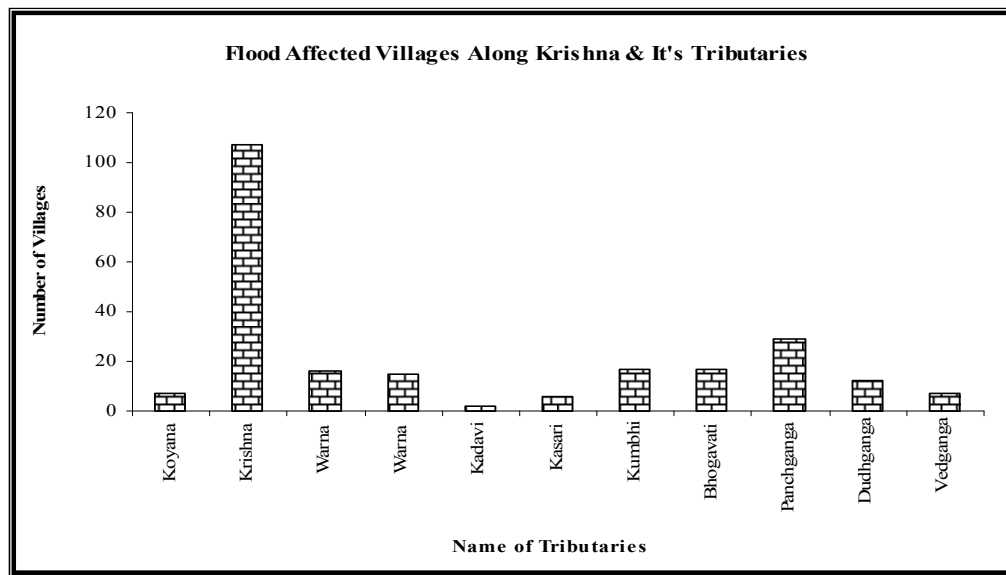


Fig. 1.1

Causes of Floods in Upper Krishna Basin:

Climatic condition of study region is monsoonal type. Though, more than 90 per cent rainfall received from south-west monsoon period (June to September) and other eight months are maximally dry. The flood disaster is a common phenomenon in rainy season due to the natural and manmade causes, which are responsible for flood condition. In upper Krishna basin, the major causes of floods are given below:

Heavy Rainfall in Upstream Catchment Area:

Continuous heavy rainfall for long period is the root cause of river floods of study region. Immense volume of water through high intensity rainfall is the

prerequisite condition for river floods. Heavy rainfall in upper catchment area is concerned with sudden increase in the water volume of downstream. Occasional heavy rainfall resulting from strong rainstorms can cause severe floods. Because of the fact that the rivers maintain very low flow and low discharge of water during most part of the year and hence sudden torrential rainfall causes sudden increase in the volume of water which cannot be disposed off by the rivers immediately and thus the river banks are over topped by the swelling water and instantaneous floods are caused (Singh, 2011). In 2005 and 2006 year, months of July and August recorded heavy rainfall in study region which become the root cause of floods.

Table 1.2: Total Rainfall in Upper Krishna Basin Recorded in 2005 and 2006.

Name of the Rain gauge Station	Rainfall received in mm	
	2005	2006
Koyana	3735	3546
Mahableshwar	3752	3573
Navaja	4018	3406
Dhom	614	785
Kanher	625	893
Warana	2087	2251
Tasgaon	241	360
Sangli	319	386
Miraj	273	387
Islampur	340	495
Shirala	658	638
Vita	259	370
Palus	155	338
Kavtemahankal	152	218

Source: Based on Hydrological Dept Satara, Sangli & Kolhapur.

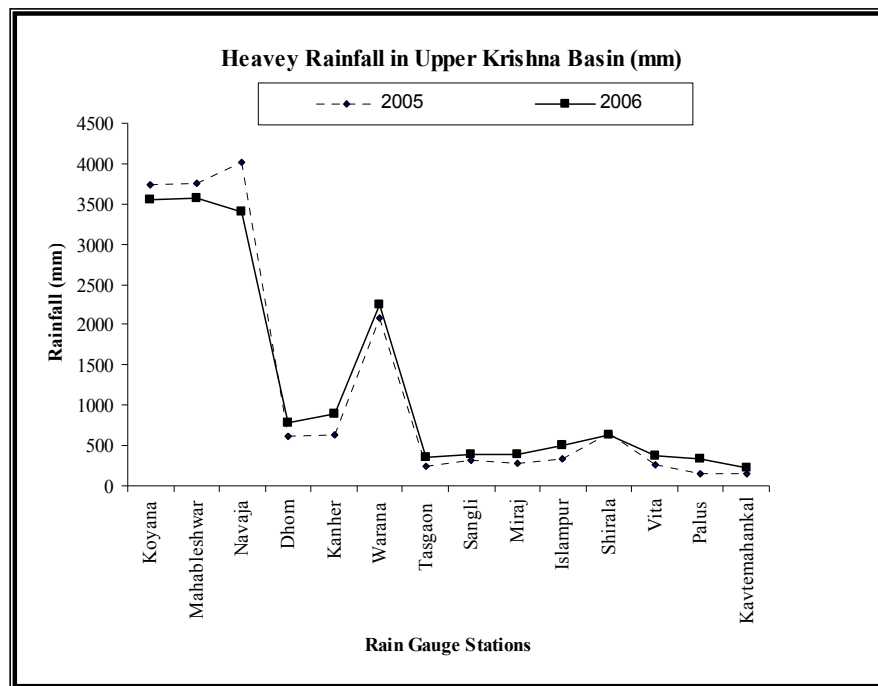


Fig. 1.2

The table and fig.1.2 shows exceptional floods were observed in the lower part of the upper Krishna basin in Maharashtra due to heavy rainfall of July

22nd to August 13th, 2005 causative factor of floods. Actual rainfall amount in study region is more than the average rainfall. Actual rainfall is highest recorded on 26th

July. Within 23 days upper Krishna basin received more than 262 mm rainfall which is double from average rainfall. Rainfall variation in this period is high from 26th to 28th July 2005 (215.3 to 233.6 %).

Effects of Floods in Upper Krishna Basin:

Flooding is the most common environment hazard; due to the wide spread geographical distribution of river valleys and coastal areas and attraction of human settlements to these areas (Kewalramani, 2006). Almost all the river valleys are subjected to varying degrees of flood incidents, either creating minor damages or devastating havocs at times. Such calamities of floods pose a serious problem to the whole environment setup of the region bringing about some of the phenomena changes of the physical environment, inrushing in accelerated erosional, transportational and depositional work of the river with the consequent effects of the soil. Vegetation and micro reliefs of the area on the one hand and devastating effects of the human habitat and activities of agriculture, industry, settlement sometimes causing loss of human and animal lives and of materials is in most cases much more grave

(Sen,1985). Flooding activities is regularly seasonal activities in plain region of India. Upper Krishna basins some part has long history of seasonal flood. But in some years flood situation was very critical.

Flood has negative as well as positive impacts observed in study region. But as compared to positive impact with negative impact, negative impacts are observed causing lot of losses.

Adverse Effects of Floods:

There are awful effects of floods more than beneficial effects. The flood area and flood duration in 2005 and 2006 are highest. So, the negative impacts are on very large scale.

Impact of Flood on Agriculture:

The agriculture land at flood prone area of upper Krishna basin is low lying area. The flood prone agriculture area in Sangli and Kolhapur district is submerged more than 10 to 15 days under flood water. Flood prone region cultivates Sugarcane, Rice, Turmeric, Soybean, Groundnut, Chilli and Grapes. Over the entire study region flood prone 13 tahsils, their villages and thousands of farmers were affected by the flood. Agriculture losses are calculated more than 50 per cent losses.

Table 1.3: Agricultural Losses by Flood in Upper Krishna Basin (2005)

Tahsil	Year	Flood Affected Villages	Agricultural Damages (ha)	Loss of Agricultural (Rs. lakh)
Patan	2005	14	40496.12	4802.80
	2006	10	23714.60	1927.12
Karad	2005	29	36892.49	2773.57
	2006	37	40434.00	4783.93
Walwa	2005	26	9054.09	6705.39
	2006	27	9081.38	6611.68
Palus	2005	37	7047.50	4212.41
	2006	29	5082.83	4073.61
Miraj	2005	19	6709.71	2663.90
	2006	19	6746.59	2626.92
Hatkanangale	2005	19	13750.00	7589.00
	2006	11	3252.76	1577.44
Shirol	2005	40	6524.00	8664.37
	2006	38	8156.61	8664.37
Total		355	216942.70	67676.51

Source: Based on District Hazard Management Department, Collector Office Satara, Sangli and Kolhapur.

The agricultural losses revels from table 1.3, the tahsil Patan has recorded nearly 40496.12 ha land was damaged which cost was Rs. 4802.80 in 2005.

Impact on Livestock :

Flood impact is seen not only on man but also on animal lives in upper Krishna basin flood prone area. When flood water

level suddenly increased; meanwhile farmers are unable to shift their animals at safety place. The cow pens (farm houses) as well as houses were surrounded by the water, numbers of animals were dip downed and some were float down with water. In Karad, Hatkanangale and Shirol tahsils were recorded for maximum animal loss.

Table 1.4: Loss of Live Stocks and Its Cost - 2005 and 2006

Tahsil	No. of Dead Live Stocks		Cost (Rs. 000)	
	2005	2006	2005	2006
Patan	09	05	90	50
Karad	137	17	1370	170
Miraj	04	04	50	40
Palus	03	02	30	16
Walwa	03	04	56	56
Shirala	02	01	16	05

Hatkanangale	04	02	50	30
Shirol	06	04	60	40

Source: Based on Govt. Flood Report, 2005 and 2006.

The table 1.4 shows that highest live stock loss found in Karad tahsil, there were 137 live stocks and 17 live stocks were dead in 2005 and 2006 and

their cost were Rs. 1370000 and Rs. 170000 in 2005 and 2006 respectively. The loss of animals in Patan tahsil observed 09 (2005) and 05 (2006) and its cost Rs. 90000 and 50000 in 2005 and 2006 respectively. Shirala tahsil of upper Krishna basin reveals less animal loss which is 2 (2005) and 01 (2006), Rs. 16000 and 5000 in 2005 and 2006 respectively. The other tahsils shows moderate loss in the respect of live stocks as well as their cost.

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