

FLOOD SITUATIONS IN RAIPUR DISTRICT -MADHYA PRADESH, INDIA

M. P. GUPTA and SARLA SHARMA

ABSTRACT : The year 1994 was the worst ever flood year in the 35 years (1963-97) history of Raipur district, when the district received 42.5% more than the average rainfall. This excess water created flood situations along Mahanadi, Sheonath and Kharun river coasts. 51,143 persons were affected by the flood and crops on 44,162 hectares of 1230 villages were badly damaged alongwith the loss of 16 human and 154 cattle lives and public properties worth Rs. 25.02 crores.

Food is a natural hazard which changes the socio-cultural identity and landscapes of any region. India faces flood problems every year in one or the other parts, and about 12.5% of its geographical area comes under flood water. About 77.5 lakh hectares land is affected by flood and the nation has to bear a loss of its crops on 35 lakh hectares very year.

AIM OF THE STUDY

The aim of this study is to delimit the flood affected areas and to analyse the causes and effects of flood in Raipur district of Madhya Pradesh state.

THE AREA UNDER STUDY

The Raipur district (19°25' N - 21°53' N; 81°25' E - 83°38' E; 21,258 Sq.Km ; 39,02,609 (1991) persons) is a part of the chhattisgarh Basin in the eastern Madhya Pradesh State. The general slope of the district is from SE to NW in south eastern part, SW to NE in the western part and W to E in the northern part. About 40% land of the district is below 300 m above sea level while remaining part is of plateaus and hills. The district is mainly drained by river Mahanadi which originates from

Sihawa hills near Dhamtari. River Sheonath, Tel, Pairi, Sukha are the tributaries of River Mahanadi.

The River Mahanadi flows in 256 Km., R. Sheonath 176 Km., R. Kharun in 101 and R. Pairi in 126 Km. in the district. On an average the district receives 1086.53mm rainfall annually mostly from S-E. Monsoon. Nearly 17% area of the district is considered as flood prone. Rajim, Dhamtari, Mahasamund, Baloda Bazar, Dheobhog, Gariaband and Saraipali were more prone to flood in the last 35 years (1963-97).

FLOOD SITUATIONS IN THE DISTRICT

The year in which the amount of rainfall exceeds more than 25% of normal rainfall , is considered as a flood year. Eight tahsils of Raipur district have been categorised as flood affected areas where the frequency of flood is more than 4 times during the last 35 years (Table - 1). The maximum occurrence of flood was 8 times in the Deobhog area situated in the Tel river basin. The flood prevailed in the low lying areas of this basin mainly because of deforestation. The excess rain water collected

Table - 1**Raipur District : Flood Situations (1963-97)**

	Tahsil	Frequency of Flood	Flood Years
1.	Deobhog	8	1971, '80, '82, '90, '91, '92, '93, '94
2.	Gariaband	7	1964, '80, '83, '85, '86, '90, '94
3.	Baloda Bazar	7	1964, '70, '71, '73, '75, '76, '94
4.	Mahasamund	7	1964, '68, '73, '76, '80, '90, '94
5.	Raipur	6	1964, '70, '80, '85, '90, '94
6.	Dhamtari	6	1964, '70, '73, '75, '90, '94
7.	Rajim	6	1964, '73, '74, '80, '90, '94
8.	Saraipali	5	1970, '71, '79, '85, '94

Source : Land Records Office, Raipur.

in the River Mahanadi broke the coast and spread over low lying and coastal areas in Mahasamund and Rajim. Similarly the low lying and coastal areas of river Pairi, Kharun, Sheonath and Surangi were under threat of flood in Dhamtari and Gariaband, Rajim, Baloda Bazar and Saraipali tahsils respectively - (Fig.-1).

Though 1964, 1968, 1970, 1971, 1973, 1974, 1975, 1976, 1979, 1980, 1982, 1983, 1985, 1986, 1990, 1991, 1992, 1993 and 1994 have been the years of flood in the last 35 years, 1964, 1980, 1990 and 1994 were among the worst flood years. The amount of rainfall in these years was 40% to 60% in excess of normal rainfall. This study is mainly based on the flood situation of 1994.

FLOOD OF THE YEAR 1994 :

About 51,143 persons of 1994 villages of the district were affected by flood in the year 1994. The Raipur, Baloda Bazar, Bilaigarh, Rajim, Simga and Kasdol tahsils grouped into the following 4 regions where flood situation was more grim :

1. The Mahanadi Coast :

The coastal areas of river Mahanadi in Dhamtari, Kurud, Rajim, Raipur, Mahasamund and Kasdol tahsils are included in this region. Nearly 7,000 hectares agricultural land of 650 villages in the coast of river Mahanadi were affected by flood in 1994. The upstream areas of river Mahanadi received heavy down pour which caused sudden rise in the level of water in the Gangrel dam (also known as the Ravishankar Sagar Project or Mahanadi Reservoir). This 3 lakh cusec excess water had to be released from the reservoir which raised the level of water and causing flood in the downstream and coastal areas of river Mahanadi and its tributaries in Rajim, Dhamtari, Kurud, Abhanpur and kasdol.

2. The Sheonath Coast :

The Sheonath coast region extends over Simga and Bhatapara tahsils and northern Baloda Bazar tahsil. About 26,012 hectares of agricultural land of 300 villages in this region were affected by the food in the year 1994. Baloda Bazar tahsil was worst affected where 175 villages were under the grip of flood and

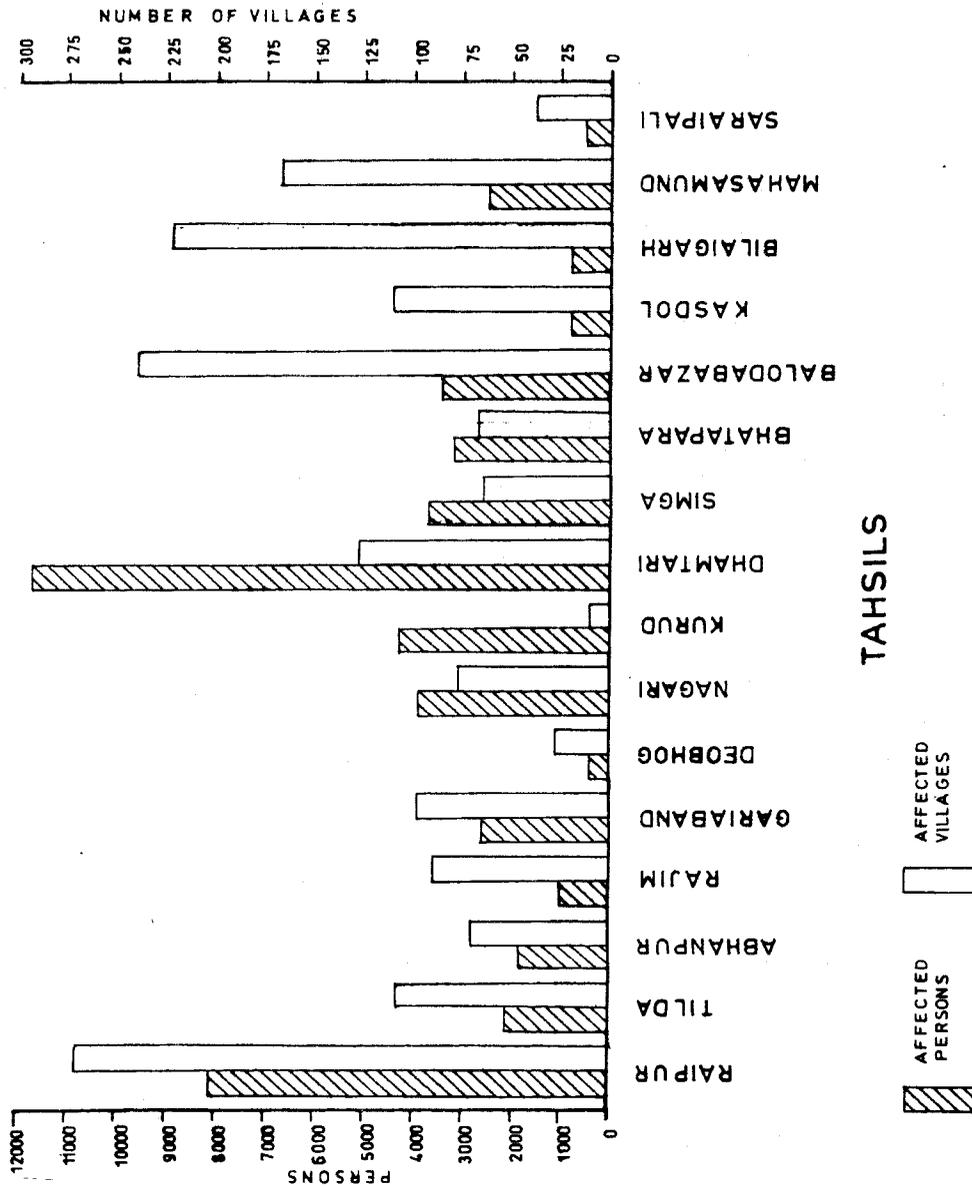


Fig. 1 : Raipur District - Flood Affected areas, 994

11,004 hectares of agricultural land of Simga tahsil was under flood water collected by excessive rainfall.

3. The Kharun Coast :

River Kharun is a tributary of Sheonath river. The western coastal areas of Kurud, Abhanpur,

Raipur and Tilda tahsils are included in this region where crops of 11,150 hectares of 280 villages were damaged by flood.

4. Other Regions :

The 764 villages along the Pairi, Tel, Sondur and Jonk river coasts were in the grip of flood

in the year 1994. Excessive rain water in the upstream areas caused flood in the coastal areas of Kolhan, Khorsi, Deorani-Jethani, Jamunia and Dhaukot nullas. In Raipur city Bajarangnagar, Rajatalab, Tikrapara, Telibandha, Turkitalab were such lowlying illdrained areas which were plunged into the water of heavy down pour.

CAUSES OF 1994 FLOOD :

The year 1994 was the worst year of flood. Though excess and high intensity of rainfall have been main causes of flood in the Raipur district, deforestation, human settlements in lowlying coastal areas, and sudden release of water from the Gangrel dam were the other reasons of flood which are discussed in the following paragraphs :

i) Early Arrival of Monsoon and Excess Rainfall :

Usually the monsoon reaches around 15th of June in the district. In the year 1994 the monsoon reached in the first week of June in the south-eastern part of district and the rain started from the second week of June in the north-western part. On an average Raipur district receives 1086.53mm rainfall (1963-97) mostly from the S-W and S-E monsoon.

But in the year 1994 the district received 1547.60mm rainfall i.e. 42.44% more than the average rainfall. The district received 381.5mm rainfall by the end of June 1994 against 170.05mm of average rainfall i.e. 211.45mm of excess rainfall in the month. Similarly in the month of July, August and September the district received 215.94, 70.18 and 33.6mm more than the average rainfall respectively. The whole district received 515.81mm i.e. 54.22% excess rainfall than the average during June and September.

2. Intensity of Rainfall :

About 99.53% rainfall of the district was received between June and October 1994 (Table - 3)

In the month of June 1994 the district received 24.65% of its annual rainfall, while 34.10, 25.18, 13.68 and 1.91 percent of annual rainfall were concentrated in July, August, September and October 1994 respectively, which were 124.35, 69.24, 21.96 and 18.86 percent more than the average rainfall in the respective months (Table 2 and 3).

In the year 1994 the district received 47.22% of its annual rainfall upto July 12. The amount of rainfall received during 14 hours was 89.6

Table - 2

Raipur District : Monthly Rainfall in Rainy Season (1963-97)

Rainfall	Months					
	June	July	Aug.	Sep.	Oct.	Total
Average (1963-97)	170.05	311.86	319.52	178.20	44.86	1024.49
Actual rainfall in 1994	381.50	527.80	389.70	211.80	29.50	1540.30
Difference between Average and actual rainfall.	211.45	215.94	70.18	33.60	(-)15.36	515.81
% Variation	124.35	69.24	21.96	18.86	(-)34.24	

Source : Indira Gandhi Agricultural University, Raipur.

Table - 3

Raipur District : Monthly Rainfall from to October
(Amount of Rainfall as % of Annual Rainfall)

Rainfall	Months				
	June	July	Aug.	Sep.	Oct.
Average Rainfall (1963-97)	15.65	28.70	29.41	16.40	4.13
Cummulative Total	15.65	44.35	73.76	90.16	94.29
Actual Rainfall (1994)	24.65	34.10	25.18	13.68	1.91
Cummulative Total	24.65	58.75	83.93	97.61	99.52

Source : Indira Gandhi Agricultural University, Raipur.

mm on July 12. On 19th July 125mm rainfall was received within eleven hours. On August 8th the amount of rainfall received within ninety minutes was 50mm, while 65 mm rainfall received within two and a half hours on August 18 and 105.9mm rainfall within twenty four hours on September 4. In this year the district received its 58.75% rainfall upto July, 83.93% upto August, 97.61% upto September and 99.52% upto October.

Weekly Distribution of Monsoonal Rainfall:

The rain started from the first week of June in 1994 and 381.5mm rainfall was received till the end of the month. The district received maximum (242.1mm) rainfall in the third week of June 1994. In this week 476mm rainfall was received at Saraipali, 350.9mm at Baloda Bazar, 274.4mm at Raipur and 211.5mm at Gariaband.

The second week of June 1994 was the period of heavy rainfall in the district. Out of 527.8 mm rainfall in July 301.6mm rainfall was received in the second week. In this week Gariaband received 399.09mm rainfall while Rajim, Dhamtari, and Raipur received 396.8, 348.9, and 335.5mm rainfall respectively. The amount of rainfall recorded in the third weeks

of July was 126.5mm. In this week Raipur and Rajim received 235 and 213 mm rainfall respectively. The second fortnight of August was the period of high rainfall. In the third week of August 206.8mm rainfall was recorded at Gariaband, and Saraipali and Deobhog received 147.8 and 141.0mm rainfall respectively. In the fourth week of August the amount of rainfall recorded at Gariaband, Dhamtari, Rajim and Raipur was 325.8, 221.4, 196.6 and 194.4mm respectively. The amount of rainfall was only 211.8mm in the month of September, of which 110.2mm was received in the first week and 27.0, 52.8 and 21.8mm rainfall was received in the second, third and fourth week respectively. Gariaband and Deobhog in the south-east and Rajim, Dhamtari and Raipur in the west received more rainfall in this month.

The Weeks of Excessive Rainfall and Flood:

The monsoonal rainfall was concentrated between first week of June and last week of September 1994 in the district. Flood situations due to excessive rain were created in Gariaband and Dhamtari tahsils in the first fortnight of June, while Baloda Bazar, Raipur, Saraipali, Gariaband, Deobhog, Mahasamund and Rajim

were gripped by flood in the third week and Saraipali, Gariaband, Deobhog and Rajim tahsils were facing the flood problem in the fourth week of June. After a gap of a normal rainfall week in July 1994, Raipur, Baloda Bazar, Saraipali, Gariaband, Deobhog, Dhamtari, Mahasamund, Rajim and Kasdol tahsils came in the grip of flood in the second week of July 1994. Flood situations were created in Raipur, Baloda Bazar, Saraipali, Gariaband, Dhamtari, Mahasamund and Rajim tahsils in the third week of July 1994 and in the fourth week of July. Baloda Bazar, Saraipali and Deobhog tahsils were under flood. Though the rainfall was normal in the first fortnight of August, Raipur, Baloda Bazar, Saraipali, Gariaband, Deobhog, Dhamtari, Mahasamund

and Rajim tahsils were under the grip of flood till the first week of September. Flood situations continued in Gariaband and Deobhog tahsils till the second week of September.

iii) Release of water from Dams :

Because of the heavy rainfall in the upstream of river Mahanadi, the water levels at Gangrel and Dudhawa dams on river Mahanadi crossed the danger mark on 12th July 1994. Therefore, the gates of Gangrel dam were opened to allow the excess water out. For the first time on 10-11 July 1994 about 2 lakh cusec water was flown in the river Mahanadi. On 29-30 July 1994 about 2.62 lakh cusec and on 4 September 1994 about 2 lakh cusec water was released from the dam. This water spread over the coastal and lowlying areas in Rajim and Dhamtari tahsils.

Deforestation in the catchment areas of river Mahanadi and its tributaries brought flood after rain in the down stream and coastal areas, while the lowlying areas around town were plunged under flood water.

EFFECT OF FLOOD IN THE DISTRICT

The district had to face flood situations for 19 times during last 35 years. The flood of 1994 was much severe when the loss of life and property was much. Rajim and Dhamtari tahsils were the worst flood affected areas. The district had to bear the loss of 16 human and 154 cattle lives by the flood. Besides about 500 livestock were flown in the flood water and the crop of 44,162 hectares and public property of more than Rs. 25 crores were damaged. About 310 km roads and 68 culverts were damaged.

i) Effect of Flood on Human Life :

About 51,143 persons of 1994 villages of 16 tahsils of the district were affected by flood. Dhamtari tahsil was the worst sufferer, where 11,732 persons of 128 villages were affected by the flood. The Gangrel dam is situated in this tahsil. Next was the Raipur tahsil where 8,122 persons of 271 villages were affected. Deobhog tahsil suffered less damage where 29 out of 169 villages and 415 persons were affected by the flood, (Fig.2) About 16 persons have lost their lives in the flood and 149 persons died of epidemic in the flood affected areas, while 2,122 persons suffered from diarrhoea, 1,849 persons from dysentery and 980 person from other diseases.

ii) Effect of Flood on Houses :

A total number of houses damaged by the excessive rain and flood in the district was 26,739 out of which 4,176 houses were fully and 22,563 houses were partially damaged. In addition to this 3,828 houses constructed on encroached areas were also damaged. Maximum number of (5,654) houses were damaged in the Raipur tahsil and minimum 124 cases of house damage were reported from the Deobhog tahsil. About 5,000 houses in 200 slums in Raipur city were also damaged where rain water was collected and penetrated in lowlying houses.

RAIPUR DISTRICT FLOOD AFFECTED AREAS 1994

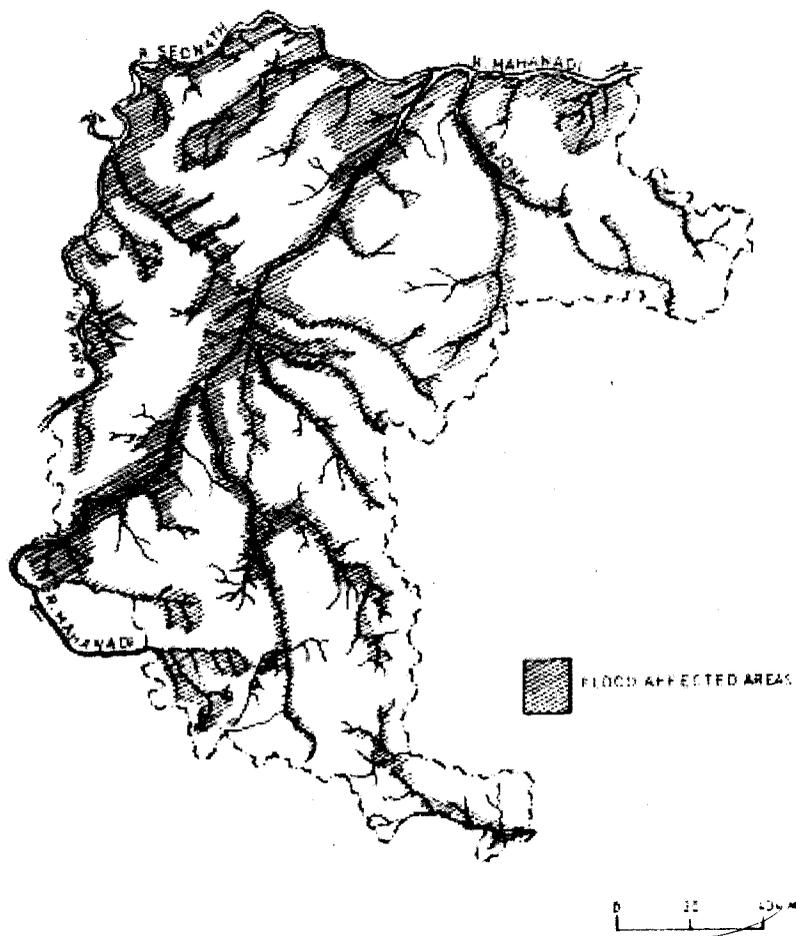


Fig. 2 : Raipur District - Tahsilwise Number of villages and persons affected by flood , 1994

iii) Effect of Flood on Transport :

Excessive rain and flood of 1994 badly disrupted the road transport in the district. The daily bus frequency from Raipur Depot of M.P. State Road Transport Corporation was

221, which was reduced to 60, particularly in the month of July and August. Consequently daily booking of Rs. 80 thousand was reduced only to Rs. 20 thousand. Many places on Raipur-Gariaband, Raipur-Mahasamund,

Raipur-Baloda Bazar roads were delinked for about 18-20 days. About 310 km. road and 68 culverts were damaged. The spate in Mahanadi, Sheonath, Pairs, Kharun rivers and Kolhan, Khorsi, Jamuniya, Sakti, Sankara, Kasaribahra, Deorani-Jethani rivulets completely disrupt the road transport between Raipur and places like Rajnandgaon, Bilaspur, Baloda Bazar, Deobhog, Saraipali and Bhatapara.

iv) Effect of Flood on Crops and Livestock:

Crops on fields are prone to suffer by excessive rainfall or flood. The crops on 44,162 hectares worth Rs. 1,83,86,158 were damaged by the excessive rainfall and flood in 1994, out of which the crops on 172 hectares were badly damaged. Maximum damage was reported from Simga tahsil where crops of 11,004 hectares worth Rs. 49,51,800 were destroyed. The crops of 9,400 hectares worth Rs. 42,30,217 were lost in the Baloda Bazar tahsil. About 154 numbers of livestock were reported dead in the flood of 1994 and the scarcity of fodder became the associated problem in the district. More than 2000 livestock died by epidemics spread in the flood affected areas after heavy rainfall.

5. DAMAGE OF PUBLIC PROPERTIES

Public properties worth Rs. 25.02 crores were damaged by excessive rain and flood of the year 1994 in the district. About 64.55% of the total loss of public properties in the district was of the Public Works Department alone followed by Irrigation Department (25.13%), Forest Department (6.07%), Electricity Board (0.11%) etc. Thirty number of public buildings, 310 km of roads, and 68 culverts were damaged costing Rs.35 lakhs, Rs. 15.5 crores and Rs. 50 lakhs respectively. Ten buildings in Dhamtari tahsil and 8 buildings in Mahasamund tahsil; 85 km of roads in Dhamtari tahsil, 20 culverts each in

Dhamtari and Mahasamund tahsils were damaged.

Relief and Rescue Works :

The flood victims were provided relief and rescue on war footing. Relief funds were granted out of State Government, Prime Minister's Relief Fund and financial assistance of Rs. 1,88,66,643 was given to 31,713 flood victims. Out of this relief fund Rs. 1,52,63,672 was given to 24,698 persons for repair of their houses, Rs. 30,79,111 was distributed among 6701 cultivators as compensation for damage of crops, Rs. 60,000 to 6 kins of those who have lost their lives in flood. Financial assistance was also given to 1,430 families of 39 villages from Madhya Pradesh Chief Minister's Relief fund. In addition to this 72,329 bamboos and 29,844 poles were distributed among 6,546 families to repair their damaged houses.

The district was divided into 5 zones each under the supervision of a Senior Medical Officer, to provide medical care in flood affected areas. In addition to this teams each consisted of a doctor, a Male nurse (Compounder), a LHB (Lower House Boy) and a open, were constituted in 24 Primary Health Centres, to provide medical care in flood affected areas round the clock. Eight teams of specialist doctors were constituted to take care in relief camps. Seven teams each of two specialist doctors were constituted in Raipur City, to tour over different flood affected areas for treatment. About 45.3 lakhs chlorine tablets, 600 packets of bleaching powder, 16,412 packets of ORS, 3,000 tablets Perinorm, 73,000 tablets Furodelazone, 14,000 tablets tetracycline were distributed among flood victims in the year 1994.

Thirty nine veterinary hospitals, 125 veterinary dispensaries and one mobile veterinary unit

were engaged to control epidemic in cattles in the district. They vaccinated 4,72,633 cattle. A grant of Rs. 82,100 for production of pasture in 986 fields, and 5,130 quintal seeds were distributed among farmers.

An advance (takabi) of Rs. 7 lakhs was distributed among farmers for the purchase of seeds of Kharif crops. A concession of 50% in the rent of tractors was given to farmers by the Agriculture department. About 1,211 quintals of paddy seed was distributed among farmers and arrangements were made to provide free transport of fertilisers, and an additional utilisation loan of Rs.1,000 was given to farmers.

Relief and Rehabilitation Measures :

The district administration Provided 185 relief camps for 42,365 flood victims in between June 23 and September 9,1994. Out of these relief camps 128 were provided in Raipur Sub-division and 40 in Bhatapara tahsil. About 2,000 persons were sent to safe places with the help of Homeguards. The jawans of Homeguards rescued 495 persons who were trapped in the Agriculture Farm at Bhatapara.

CONCLUSION

Raipur district faced flood situations for 19 times during 1963-97 in which 1964, 1980, 1990 and 1994 were the worst flood affected years. In these years the amount of rainfall was 40 to 60 percent higher than the average rainfall. Besides high rainfall and its intensity, deforestation, construction of house in lowlying

areas and sudden release of water from the Mahanadi Reservoir were the causes of flood. In the year 1994, the district received 1547.6 mm rainfall which was 42.5% more than the average rainfall. The district received 515.81mm more than the average rainfall during June and October 1994. The district received 24.65, 34.10, 25.18, 13.68 and 1.91 percent more than the average rainfall in the month of June, July, August, September and October 1994 respectively, with the result water levels at Gangrel and Dudhawa dams crossed the danger marks in the second week of July. About 51,143 persons were affected by the flood of 1994. About, 7,000 hectares of agricultural land of 650 villages in the Mahanadi coast, 26,012 hectares of 300 villages in the sheonath coast, and 11,150 hectares of 280 villages in the Kharun coast were badly effected by flood. Rajim and Dhamtari tahsils were the worst sufferers, Sixteen persons, 154 live-stock lost their lives besides public properties worth Rs. 25.02 crores.

The severity of flood can be minimised by taking preventive measures before the arrival of monsoon. Weather forecasting and cautions will effectively reduce the losses. Excess water from dams should be released after giving proper warning to the residents along down stream river costs, Civic bodies and administration should check the development of slums in lowlying areas, and provide relief and rescue as early as possible where and whenever needed.

REFERENCES :

- Kayastha, S.L. 1983 : ‘Flood in India’, A Study of their Occurance, Causes, Forecasting and Control, NGJI, Vol. 29 Pt. 3 & 4 pp - 121-124
- Pandey, J.N.1989 : ‘Water resources use and conservation in Saryupar Plain’, Uttar Bharat Bhoogol Patrika, Vol. 25, No. 2 pp. 48-64.

Sharma, S.C. and O.P. Mishra 1979: "Flood Problems of Gonda District : A Geographical Analysis." Uttar Bharat Bhoogol Patrika, Vol. 15, No. 1 Jan, PP-11-26.

Singh, Kannshia 1972 : "Water Balance in Eastern Uttar Pradesh", Geographical Review of India, Vol. XVIII p. 99.

ADDRESS OF THE AUTHOURS

Dr. M.P. Gupta

Reader in Geography,
Pt. Ravishankar Shukla University,
RAIPUR (M.P.) - 492 010

Dr. (Mrs.) Sarla Sharma

Senior Lecturer in Geography
Pt. Ravishankar Shukla University,
Raipur (M.P.) - 492 010.