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Community Based Disaster Management (CBDM) - A surveillance of Chhattisgarh.

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Abstract : The information about the disaster management program generated by the Government has not been disseminated in the communities properly, particularly in tribal population. The present study suggests that community disaster management education is essential and will develop capacity building amongst community in general and tribal population in particular to face disaster. The government should focus on the implementation of the programs at the grass root level through active community education. It is suggested that community level mitigation programs (CLMP) should also include structural and non-structural measures. The structural measures are safe construction, retrofitting, community shelters, legal framework while non-structural measures include financial resources in which Government(s) should actively involve Insurance companies, Municipalities, Corporations, Corporate houses Boards, Nigams , District Administration, Panchayats, Block level and Village level committees for providing sources of obtaining funds. Utilization of funds and awareness of proper construction of houses disaster free to avoid loses of the property and human life in any disaster. It is also suggested that survey through satellite be made for locating fresh underground water resources on account of draught due to short rain fall.

Key Words : Community, Disaster, Management, Technology, Information.

Introduction :

The disaster educated communities are defined as a means to assist communities in minimizing their vulnerability to natural hazards by maximizing the application of the principles and techniques of mitigation to their development and redevelopment decision-making process (Geis, 2000). Abolshams Asghari (2004) suggested that it is essential and helpful to educated to understand the community to face severe natural disasters. However, he also suggested that the disaster-resistant community model assumes a passive role for the community, as it is more relevant to the decision-making process than to engaging the communities. According to McEntire *et al.* (2002), the disaster-resistant community approach is more pertinent to disciplines such as geography, engineering, and urban planning. Consequently, it is not a holistic approach to disaster management, as it ignores the contribution of many academic disciplines, such as public administration, sociology, economics, political science, anthropology and psychology. Community education is essential in mitigation programs. In community education, even simple instructions play a vital role in disaster mitigation. Elliott *et al.* (2003) stated that community education, engagement, and awareness are the most important factors in improving warnings during disasters. Similarly, Davoodi *et al.* (2004) also stated that community education as the core of any disaster planning, because communities are the basic units. The present study is based on drought, flood (depends on Rainfall), industrial disasters, and manmade disasters and on field experiences during project with SAIL (Steel Authority Of India) and SARC (Society for Application Research and consultancy), a voluntary organization, working under corporate social responsibility in Dalli-Rajharra Mining area of Durg District.

Materials and Methods :

Data used in this investigation was primary, obtained from Government sources while the secondary data were collected by survey. LISS III Image of area is also used. The software used was Arc-GIS 9.1 and ERDAS Imagine 8.7.

Study Area :

Chhattisgarh, a 21st century State, came into being on November 1, 2000 by the Act of Parliament. Chhattisgarh takes its name from 36 (Chattis is thirty-six in Hindi and Garh is Fort) princely states in this region. Chhattisgarh is bordered by Bihar, Jharkhand and Uttar Pradesh in the north, Andhra Pradesh in the south, Orissa in the east and Madhya Pradesh in the west. The total geographical area of the state is 137,360 Sq. Kms. and nearly 44% of it is covered with forests. The main sources of water in the state are rivers, tanks and ground-water. The state has important rivers providing a lifeline to the socio-economic development of the state, such as Mahanadi, Sheonath, Indravati, Arpa, Hasdeo, Kelo, Son, Rehar, Kanhar etc.. The geographical area of the

state can be divided into five river basins, they are Mahanadi Basin, Godavari Basin, Ganga Basin., Narmada Basin and Brahmani Basin and Total Basin Area covered is about 137,360 Sq.Km. Since then the land has witnessed faulting, submergence, marine invasion and upliftment. The Physiography of Chhattisgarh can be divided into four physiographic provinces they are Chhotanagpur Plateau, Baghelkhand Plateau, Mahanadi Basin and Dandakaranya up-land **. T**he entire state is having high temperature (Table 1) and the area of the study is depicted in Fig.1.

Results and Discussion :

Disasters in Chhattisgarh:

The disasters has been divided into four categories they are drought, flood (depends on Rainfall), industrial disasters, and manmade disasters**.**

Regarding drought, Chhattisgarh was declared during 1960-2000 as drought state. On analyzing the data it has been noticed during last 40 years the rainfall in different months and years was not normal but occurred abnormal and often drought condition persist (Table 2). It is interesting to note that the drought (37.5%) conditions persist every five years of interval. The pre and post monsoon droughts were very regular phenomenon in the state, the maximum drought has been occurring mainly during the period of October-May and these months are registered for 97.88% drought months.

The main Districts which are drought prone were Raigrah, Bilaspur, Janjgir-Champa, Mahasamund and

Table 1. Average Max. &Min. temp.(in centigrade) **During different month in different station [Avearge From 2000 to 2008]**

Month	Bilaspur		Janjgir-champa		Korba		Raigarh		Jashpur		Ambikapur	
	Max.	Mim.	Max.	Mim.	Max	Mim.	Max.	Mim.	Max.	Mim.	Max.	Mim.
Jan.	24	10.9	27.2	13	23.4	11.3	19.7	9.4	28.3	13.2	23.2	7.9
Feb.	27.2	13.6	30.7	15.6	20.5	14.3	29	13	31.6	16	26	10.7
Mar.	31.9	18	35.5	19.6	26.6	16.5	32.9	12.4	36	20.4	30.8	15
Apr.	36.5	22.7	40.2	24.4	36.9	26.3	36.7	20.7	40.3	25.1	35	19.9
May	39.1	25.9	42.7	27.9	43.6	19	42.5	27.7	42.6	28	37	22.7
June	35.3	25	38.2	27	38	28.3	38.5	16.9	38	27.1	33.1	23
July	29	22.8	31.3	24.5	30.1	24.5	31.9	23.1	31.6	24.7	28.1	21.8
Aug.	28.4	22.5	30.7	22.5	27.4	22.1	29.2	20.8	31.1	24.7	27.6	21.5
Sep.	29	21.9	31.6	24.3	25	20.9	26.8	12	27.2	24.5	28.3	20.8
Oct.	29.2	18.7	31.7	21.4	20.3	15.2	22.5	18	23.4	22	19.4	20.2
Nov.	26.9	14.1	29.7	16.4	19.6	13.6	19.6	11.7	18.3	17.1	16	19.5
Dec.	24.3	10.9	27.3	13	17.9	10.6	16.9	7.7	14.2	13.3	13.7	5.9
Mean	30.1	18.9	33.1	20.8	27.44	18.6	28.9	16.117	30.217	21.34	26.52	17.41
SD	4.75	5.37	4.98	5.23	8.223	5.9	8.11	6.0751	8.5888	5.248	7.306	6.021

Source : Agriculture Department, Government of Chhattisgarh.

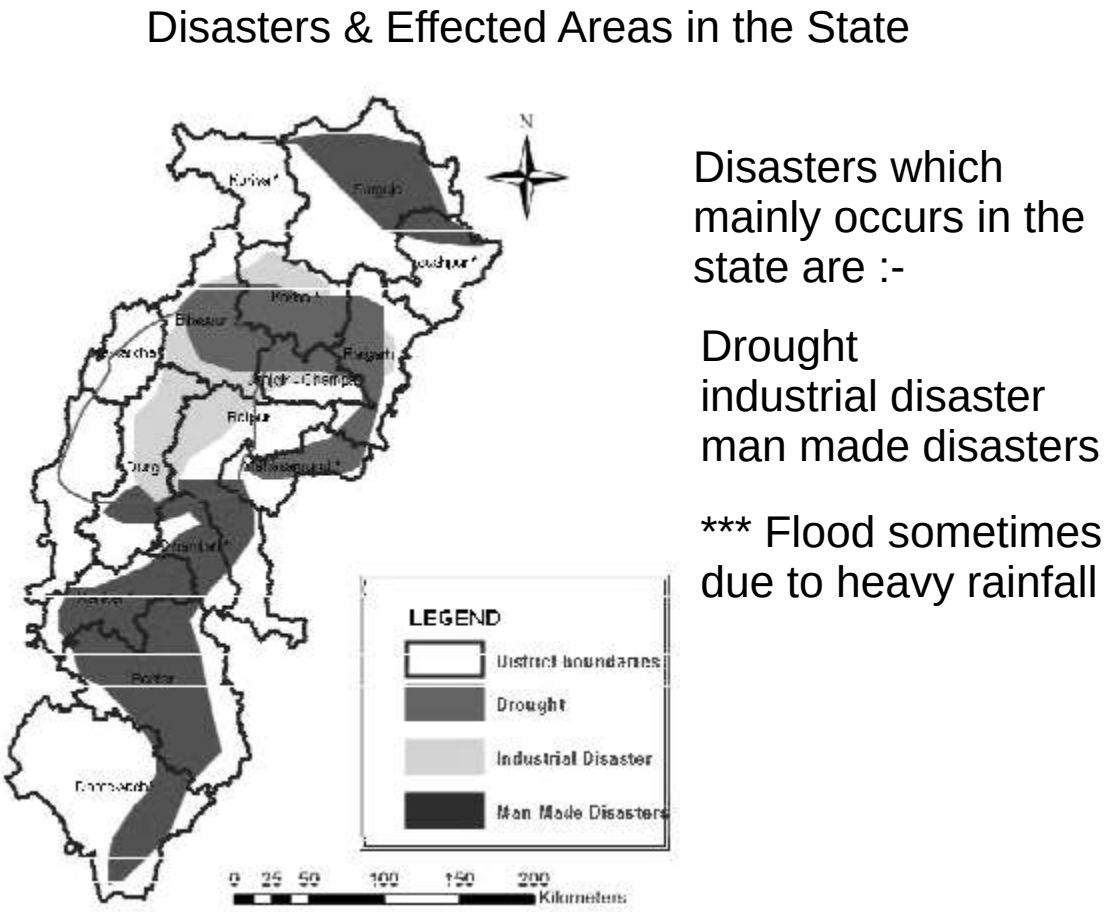

Figure 1 : The map showing disasters areas (as taken for the study) in the state..

Kwardha 66 blocks were declared drought prone in the year 2008-09. The drought like situation arises because of the lack of appropriate water management system. The water harvesting measures are still not implemented strictly neither in the rural nor in the urban area of Chattisgarh state. There were either little or no water in the seasonal rivers due to lesser amount of rainfall and also due to high temperature. The highest temperature was recorded in Raigarh and a part of Janjgir-Champa district, the area is having more than 27 degree C temperature annually. Lowest was recorded in Jashpur which is below than 23 degree C annually. It is apparent that the entire state is having high temperature (Table 1). The lack of water management and less of rainfall have been the main cause of drought, if properly handled drought could be as managed to a greater extent as also suggested by Singh (1995) and Elliott *et al*. (2003).

Asian development bank had already given a loan for participatory irrigation management in the state which has further slow down the problems of community for the water crisis. The water crisis is mainly due to drought and drought like situation. For this also the responsibilities should be properly taken by the each stakeholder for proper management of water resources as reported by Lohani, 1997.

Chhattisgarh have become first destination for industrial houses but the qualities of poor industrial constructions are leading to Industrial disasters. In addition to Industrial development, mining activities in mining area (coal, iron and others) are also responsible. Unfortunately, the lands are being utilized for mining activities finally leading to land degradation and deforestation leading to pollution (Table 3). The present study shows poor socioeconomic conditions persist amongst the villagers who are only employed as workers in the mining activities with poor wages without proper houses, food and poor health services. The above mentioned facts lead to man-made disaster of human suffering, loss of life and long-term damage to a country's economy and productive capacity.

Table 2. Annual rainfall distribution (in mm) in some districts of Chhattisgarh [2000-2008]

Year	Bilaspur [Pendra] (mm)	Janjgir-Champa (mm)	Korba (mm)	Raigarh (mm)	Jashpur (mm)	Ambikapur (mm)	Koriya (mm)
2000	674.5	1337.25	1308.5	1189.5	1152	1204.9	1181
2001	1028	1272.9	1410.5	815.1	1591.3	1651.7	1463.2
2002	857.6	930.8	1019.5	1261.6	1211.7	1664.7	926.3
2003	1242	1561.2	1778.8	1555	1647.4	1606.2	1785.9
2004	1028	1250	1266.7	1102.3	1172.6	1002.6	1271.5
2005	1308	1168.4	1510.3	1284.9	1211.8	996.2	1250.3
2006	1208	1147.41	1355.1	1178.03	1037.01	1356.8	1211.67
2007	1149	1012.22	1168.60	1099.12	984.28	1543.9	1345.98
2008	1021	901.25	1109.12	939.89	1011.05	987.7	925.45
Mean	**1057.3**	**1175.714**	**1352.25**	**1158.382**	**1224.349**	**1334.967**	**1262.367**
Standard deviation SD	**199.16**	**209.9271**	**228.1866**	**211.4118**	**239.8126**	**293.5735**	**263.9332**

Source : Agriculture Department, Government of Chhattisgarh.

Table 3. Forest Distribution in the Study area

S.No	Forest Type	Area Covered (Sq.km.)	%	Major species	Degradation in 10 years
1.	Dense Forest	2082.17	25.29	Sal (*Shorea robusta*) and Teak (*Tectona grandis*)	07.5%
2.	Non Forest	5801.66	70.48	NA	23.47%
3.	Open Forest	246.36	2.99	Saja (*Terminalia tomentosa*) bamboo (*Dendrocalamus strictus*)	00.94%
4.	Scrubland	9.99	0.121	NA	NIL
5.	Water Body	91.29	1.109	NA	0.06%

Source : The Level of Degradation of forest area is being calculated from the Map (Arc GIS 9.1)

Table: 4 A : Disaster and Vulnerability Assessments and Factors Determining the Community's coping Capacity in the state

Table 1.3A: Disaster Assessment in the state.		
Disaster **Assessment**	**1.Disaster type**	Flood, Drought(Natural Diaster), Industrial Disasters, Man Made Disasters (naxal Movement)
	2. Caution indication	Flood → Excessive rainfall, inadequate drainage system. Drought → No Rainfall, inadequate rainfall(rainfall less than required in an area). Industrial Disasters→ No such mechanism available as on date.(As the Korba Chimni disaster was Industrial disaster, open cast Mining and its Effect on the Environment specially on the forest resource is also Industrial Disaster, The water policy of Chhattisgarh state is not yet decided and the industrial housed are exploiting the water resources of the state which is finally leading to various type of water crisis)
	3. Forewarning	Rise in river level, Torrential rainfall related information dissemination from Emergency Flood Control Center (Bhuria), Raipur. For Drought There is no such system and Same for Industrial disasters.
	4. Speed of onset	Flood → Moderate, Drought→ Moderate, Industrial Disasters→ Mild to Extensive,
	5. Frequency	Flood → Once in every 2 years Effected Drought → Once in 5 years. Industrial Disasters→ Frequency of such hazard not yet measured.
	6. When	Flood → During monsoon (June-Sept) Drought →During (May-July) Industrial Disasters→Anytime, anywhere
	7. Duration	Flood → Days, (Seasonal) Drought → Months, Years. Industrial Disasters → Sudden & Momentary.
	8. Extent	Flood → Low lying area near Mahanadi Basin & surroundings may get flooded during monsoon, due to rise in river level. Drought → Rural and Agriculture Lands. Industrial Disasters → Applicable to all the industrials areas and peripheral areas.

***Vulnerability is the degree to which, the community is affected. Hence its assessment is very vital. **(Source: Based on field study analysis for disasters in Chhattisgarh)**

Man-made disasters are events which, either intentionally or by accident cause severe threats to public health and well-being.

The last decade has seen a marked increase in what are known as "complex emergencies**"** - complex because internal conflict lead to the breakdown and collapse of social, political and economic structures. Inevitably agriculture and food production are major casualties (Table 4 A, 4 B, 4C) showing the detail about the study for social and economic factors (Burton, 2004; Singh 1995, 2004 & Trim,2004). The present study suggests that Government should give main emphasis on basic need such as Insurance, Rehabilitation, Food and shelter, infrastructure with Expert Consultant, and Trained Village Resource Person should reach to Stake holders.

Table 4 B : Disaster Vulnerability Assessment in the state

Vulnerability Assessment	**1. Disaster type**	Flood, Drought , Industrial Disasters etc.
	2. Elements at risk: Infrastructure	Fly Ash bridge at Korba near Sarmangle , Arpa Bridge in Bilaspur near Sanichari ,Farmland, Roads, Crops, Hospitals, Schools, Industrial compound and under ground Mines areas inBilaspur,Surguja Korba, Raigrah,Dondi Lohara of Durg.
	Housing	Houses built by Mud mainly in rural areas.
	Livestock, etc.	Cows, Buffaloes, Oxen, Goats, Dogs etc.
	3. People at risk	Residing in weak structures all the villages have (Mud Hut) in Chhattisgarh , old age people, children, ladies, handicapped & isolated persons. Low-income groups: find it difficult to recover after disaster Women as a group are disproportionately affected by disasters Race / caste / ethnicity is closely related to their differential abilities for recovery Elderly people have limited coping strength In rural areas, vulnerable groups include smallholder agriculturalists, pastoralists, landless laborers, and the destitute
	4. Location of people at risk	Residing in villages near river Basin and remote forest side, areas of south Bastar Kanker are very remote many villages of study area does not have roads therefore it is difficult to communicate, alert & evacuate people from these areas.

Source : Based on field study analysis for disasters in Chhattisgarh

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Table 4 C : Factors Affecting Vulnerability in the state

Factors	**No. of villages Affected**	**No. of people affected**	**Major cause**
Economic			
Income, employment, livelihood, etc.	1245	(355,116 persons)	Poverty, unemployment, illiteracy, there is no source of livelihood are main causes (The Unorganized Labours Sector is the Biggest sector in Chhattisgarh) during monsoon all construction sites are closed.
Gender			
Male including Male Child	12		People drowned due to severe flood
Female including Female Child	18		Couldn't survive during severe flood and lack of Immediate rescue operation
Age Groups	All age group people		Impact of Flood. (Most of the people evacuated to government camps in time). No. of Camps are **82 .**
Ethnicity	Tribal of Bastar & Farmer Community suffered huge tangible & intangible losses.		

Source : Disaster Management cell, government of Chhattisgarh

***This is the example of most credible vulnerability, in this area. Apart from it, if we consider other cases like Man Made disasters generally in South Bastar Kanker (Here reference is about Naxal Movement and threat to public Life), then the overall vulnerability may lead to higher figures/nos. The combined effect of worst scenario is hampering economics of more than 20,000 families these families are staying in relief camps, which is quite high. But one of the best practices of Community based Man made Disaster Management can be seen in relief camps and in the form of "SALWA-JUDUM" here communities are together against terror a new form of Man made Disaster in the present scenario.

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