CHAPTER-III Risk Assessment and Vulnerability Analysis

3.1 Introduction:

Disasters impede socio-economic development. Disasters affect population where there is physical, infrastructural, environmental or socio-economic vulnerability. The higher the individual and other vulnerabilities, the higher are the risks. A comprehensive understanding of the pattern of various hazards is crucial in order to have a focus and prioritise the scarce resources for ensuring sustainable development in areas and populations at risk. Similarly, identification of various disasters and the assessment of the consequent effects of such disasters are essential to adopt preventive, preparedness, response and recovery measures to minimise losses during disasters and ensure quick recovery.

3.2 Socio-economic Vulnerability:

The vulnerability of an area is determined by the capacity of its social, physical, environmental and economic structures to withstand and respond to hazards. An analysis of the vulnerability in a given geographic location, an understanding of the socio-economic factors and the capability of the community to cope with disasters, will give an understanding to the development and disaster managers to plan for risk reduction against future hazards.

Major Socio-economic Indicators of the District

Sl. No.	Particulars	Units/ Magnitude
1.	Geographical Area	662602 Hecters
2.	Demography Men	859086(As per 2001 census)
	Women	862583 (as per 2001 census)
	Total	1721669 (as per 2001 census)
	Population Density	251 (as per 2001 census)
	Sex ratio (female per '000 Males)	1004
	Decennial growth rate	9.66
	%SC Population	18.1
	%ST population	1.5
	%of Urban population	17.7
	Total literacy rate	68.6
	Male literacy rate	78.4
	Female literacy rate	59.0
	SC literacy rate	
	ST literacy rate	
	Urban disabled	
	Rural disabled	
	Child Population (below 6 years)	97694
3.	**Economics**	

	Per-capita income % of people living below poverty line % of urban people living below poverty line % of rural people living below poverty line	24600 (2006-07)
4.	**Health** Infant Mortality rate Maternal mortality rate Prenatal mortality rate Neonatal Mortality rate Post natal mortality rate Still-birth rate Crude birth rate Crude death rate Population served per bed Population served per doctor Population served per medical institute Area served per medical institution	

5.	**Agriculture** **Gross cropped area** **Net area sown** Consumption of Chemical fertilizer Per capita food grain production Per capita availability of cultivable land Percentage of small and marginal holdings Percentage of marginal and small farmers	440719 Hecters 369655 Hecters 67.4 21.8
6.	**Infrastructure** Length of National Highway Length of State & Express Highways Length of major & other district roads Length of village roads	168 k.m. 813 k.m. 2957 k.m.

	Number of registered vehicles	158931
	Railway length	244 k.m.
	No. of buses available per lakh population	
	Persons served per post office	
	Area served by a post office	
	Percentage of villages electrified	
	Percentage of households electrified	
	% having access to safe drinking water	
	% having access to sanitation	
	Population served per bank	
7.	**Employment Total workers**	
	Proportion of workers to total population Main workers to total workers	702827
	Cultivators to total workers	475816
	Agriculture labourer to total workers	126659
	Total unemployed	856958

a) Economy:

b) Social Structure

c) Education:

d) Gender Ratio **1004**

e) People needing special care:

f) Malnutrition

g) High Mortality:

h) Lack of access to infrastructure:

i) Urbanization:

3.3 Vulnerability to various Hazards:

Details of areas vulnerable to floods, cyclones and earthquakes:

Type of Hazard	Particulars	% of Area vulnerable
Flood	Flood Prone	
	Flood Protected	
	Outside Flood Area	
Cyclone	198-180 Km/h	
	169.2 Km/h	
	158.9-140.9 Km/h	
Earthquake	Low damage risk Zone	
	Moderate damage risk zone	

3.4 Disaster specific proneness to various types of disasters:

I) Vulnerability to floods:

II) Vulnerability to cyclones:

III) Vulnerability to droughts:

Rainfall interval (in mm)	Frequency during the decade					
	50's	60's	70's	80's	90's	Total
1500 and above						
1499-1300						
1299-1100						
1099-1000						
Less than 1000						

Source: Department of Agriculture

Kharif season in the Table below:

Drought year	Rainfall during monsoon season (mm)			Production of Kharif crop(in lakh tones)		
	Normal	Actual	%Deficiency	*Normal	Actual	% Loss

source: Department of Agriculture

V) Vulnerability to Earth Quakes:

VI) Vulnerability to chemical disasters:

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MAJOR POTENTIAL HAZARD AREA

Sl.	Name of the Area	Taluk	Types of Hazardous Chemicals Handled	Type of Hazard

Source: State Pollution Control Board

VII) Vulnerability to accidents:

VIII) Vulnerability to Epidemics and Biological Hazards:

A) Biological hazards to human beings:

B) Epidemics amongst animals:

VIII) Vulnerability of critical infrastructure to natural hazards:

A) Potential effects of natural hazards on water supply system

Hazard Type	Infrastructure Type	Impact	Consequences
High winds	Reservoirs Over head cables	Wave surcharge, overtopping of dams Blown down	Scour downstream, endangered dams Power and telecom failure
Heavy rains	Reservoirs Rivers River off take Treatment works Pumping stations	Over topping of dams Riverine floods Scour Flooding Flooding	Possible dam failure Difficult treatment Loss of source Close down Close down
Earthquake	Reservoirs Ground water Transmission mains, aqueducts, Canals	Structural failure of dams Liquefaction of deposits Line fracture	Loss of supply, flooding damage downstream Fracture of wells, supply failure Supply cut

	Treatment works Service reservoirs Pumping stations below	Damaged Damaged Damaged	Loss of operation, reduced output, close down Loss of storage Lost or reduced
	and above ground Distribution system	Pipe fracture	capacity Burst, leakage, loss of storage

B) Potential effects of natural hazards on electricity generation and distribution

Hazard Type	Infrastructure Type	Impact	Consequences
High Winds	Transmission towers and Lines Generating stations, Cooling towers, substations, Distribution lines (overhead)	Collapse Damage and partial Collapse Collapse	Loss of supply Loss of supply Loss of supply
Heavy rain	Reservoirs Generating stations, other facilities	Over topping of dams Flooded	Possible progressive failure Loss of supply
Earthquake	Dams Generating stations, Sub-stations, other facilities Distribution lines	Damage from ground failure and motions Damage from Ground failure and motion, e.g. isolators, equipment support frames Collapse of lines and pole mounted transformers	Loss of supply Loss of supply Local loss of supply

C) Potential effects of natural hazards on communication systems

Hazard Type	Infrastructure Type	Impact	Consequences
High winds	Radio and TV towers Overhead cables,	Disorientation Collapse of poles	Disruption to or loss of transmission capability Loss of transmission,
	Serving of cables	Loss of service	high fault rate

Earthquake	Radio and TV towers Overhead cables Underground cables Telephone exchanges	Damage/collapse Collapse of Poles, serving of cables Damage to cables and broken ducts Dislocation of printed circuit boards, collapse of building	Complete loss of transmission High fault rate, loss of service Complete loss of service Long term loss of services
Heavy rain	Radio and TV towers, Underground cables Telephone Exchanges	Interference with signal path Flooded Flooded	Temporary loss of service High fault rate Complete loss of service

IX) Summary of risk assessment and Vulnerability analysis of major hazards in various hoblies of the district

Name of Hoblies	Wind and cyclone	Flood	Drought	Earthquake	Accidents

Wind & Cyclone: 1 – Very high risk; 2 – high risk; 3- moderate risk; 4 – low risk

Flood: 1 Flood prone; 2 – Flood Protected Drought: 1 – Very high; 2 – High; 3 – Moderate Earthquake – 1 – Low Risk; 2 – Moderate Risk Zone Accidents – 1 – High Risk, 2 – Moderate Risk