

## FLOOD HAZARD ZONATION SCHEMA

Based on the analysis of about 100 satellite datasets, acquired during floods of 2001-2018, the flood hazard layer for Odisha state was derived. The hazard layer represents areas subjected to number of times flooded during last 18 years, such as 14-times flooded, 13-times flooded, etc. The flood hazard layer has been classified into 5 categories based on the frequency of inundation (Table 1). Very Low category indicates the areas which are inundated one time during the 18-year period. Similarly, Low indicates two to four times, Moderate indicates five to six times, High indicates seven to nine times and Very High indicates ten to fourteen times.

Table 1: Flood Hazard Classification

Sl.No	Flood Hazard Classification	Number of times / years the area was subjected to flood inundation during 2001-2018
1	Very Low	1 time
2	Low	2-4 times
3	Moderate	5-6 times
4	High	7-9 times
5	Very High	10-14 times (almost every year)

To facilitate better visualization, the following colour coding scheme has been adopted for different hazard zones based on their frequency of inundation.

	Very Low
	Low
	Moderate
	High
	Very High

## FLOOD HAZARD INDEX

In addition to categorizing the flood hazard zones, an attempt is made to find the severity of flood hazard in various districts, using the following flood hazard index.

Flood hazard Index =  $\sum$  Hazard Category(H) x Hazard Area (A)

1. Weightages were given to each category of flood hazard (H) and are shown in Table-2
2. Weightages were also given as per the percentage of flood hazard area (A) in the district as shown in the Table-3

Table-2: Weightage for Flood Hazard category

Hazard Zones	Weightage for Hazard Zones (H)
Very High	5
High	4
Moderate	3
Low	2
Very Low	1

Table-3: Weightage for % Hazard Area

Percentage of District Hazard area	Weightage (A)
0-10%	1
11-20%	2
21-30%	3
31-40%	4
41-50%	5
51-60%	6

61-70%	7
71-80%	8
81-90%	9
91-100%	10

### Major Observations

- About 8.96% (13.96 lakh hectares) of land in Odisha state is affected by flood during 2001-2018 (Table-4).
- Out of total flood affected area (13.96 lakh hectares), about 2.81 lakh hectares of land falls under high (inundated 7-9 times) to very high (inundated 10-14 times) flood hazard categories.
- Within flood hazard zones, the percentage area of each flood hazard category varies from 7.26 to 37.36.91. Fig-1 shows the graphical distribution of area under different hazard categories.

Table-4: Flood Hazard Area under Various Categories

SI no	Hazard Severity	Flood Hazard Area (ha)	% Flood Hazard (wrt State Geographic Area)	% Flood Hazard (wrt Total Flood Hazard Area)
1	Very High	1,01,339	0.65	7.26
2	High	1,80,599	1.16	12.94
3	Moderate	1,98,079	1.27	14.19
4	Low	5,21,762	3.35	37.36
5	Very Low	3,94,341	2.53	28.25
	<b>Total</b>	<b>13,96,640</b>	<b>8.96</b>	<b>100.00</b>

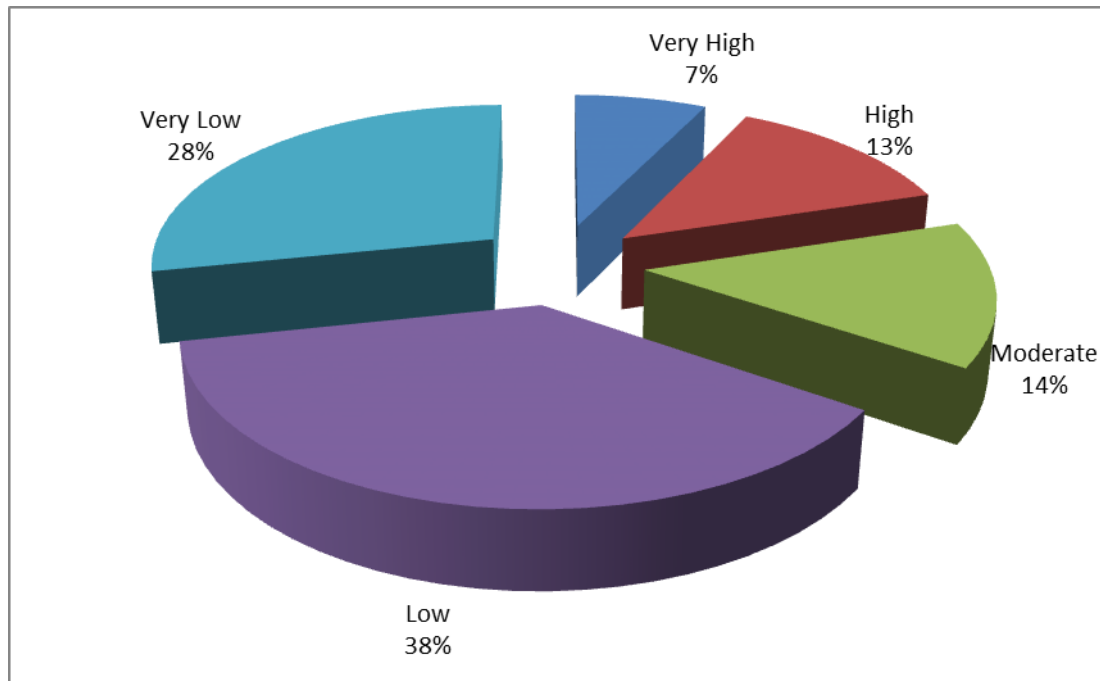


Fig 1: Percentage of various hazard categories w.r.t total hazard in the state

#### LIMITATIONS

The flood hazard zonation was carried out with the available satellite data with NRSC. The satellite coverage may not correspond to the peak flooding in all cases. Further, all river gauge stations need not record the peak situation on a single day. For States like Odisha where the topography is quite gentle, the flood inundation remains same for few days, even after the peak situation has passed. Hence, satellite data acquired even after the flood peak has passed resembles the peak situation most of the times. Observed flood inundation includes flooding due to embankment breaches and rainwater accumulation in low lying areas. Ground validation is being carried out.