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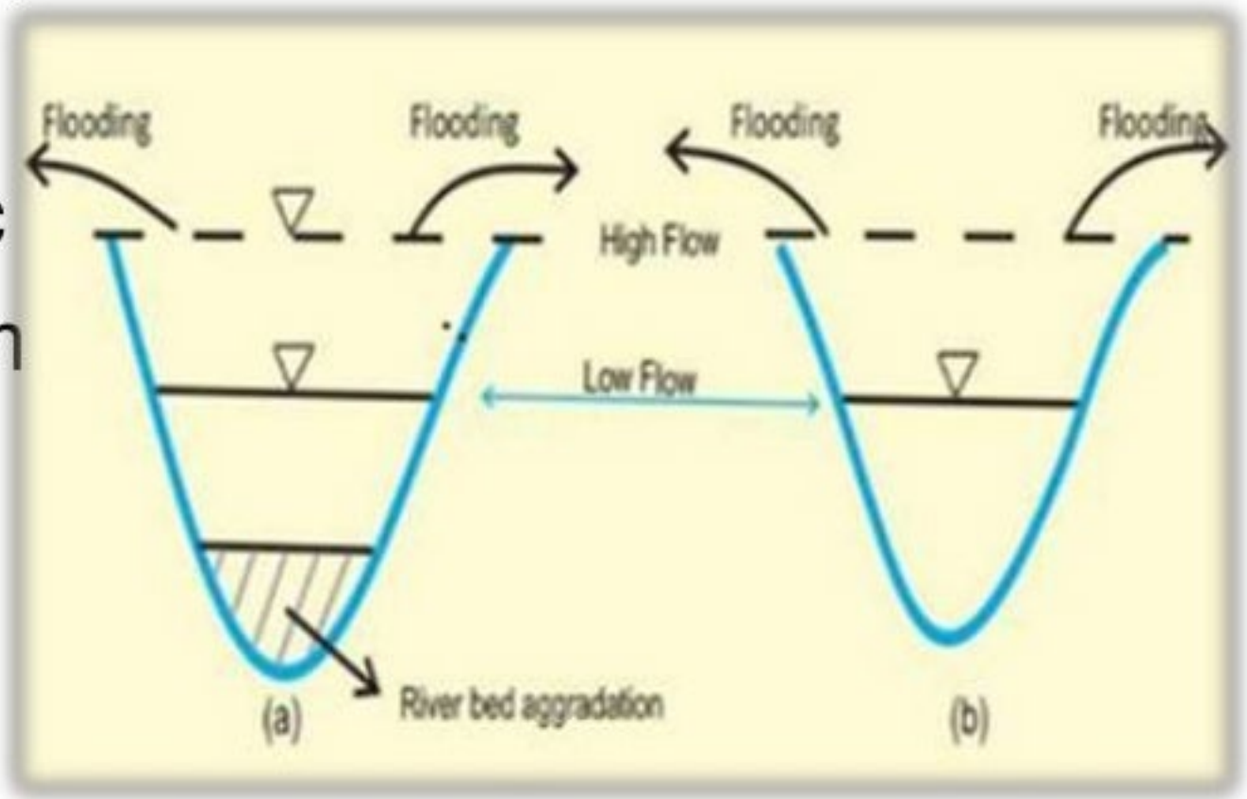
Introduction

- Flood is overflow of excess water that submerges land and inflow of tide onto land.

- Most frequent and deadliest

Occurs when the geomorphic equilibrium in the river system is disturbed because of-

- Intrinsic threshold
- Extrinsic threshold



Causes of flood

Natural

- Heavy rains
- Melting of ice during volcano eruption
- Undersea earthquake
- Marine landslip

Meltwater + Volcanic ash & other debris

LAHAR

Man-made

- Bank erosion
- Breach of dam/barrage/embankment

Effects of flood

PRIMARY	SECONDAR	TERTIARY
Due to direct contact of flood water	Due to result of primary effect	Due to combined effect of primary & secondary effect
Physical damage	Disruption of essential services	Long term effect

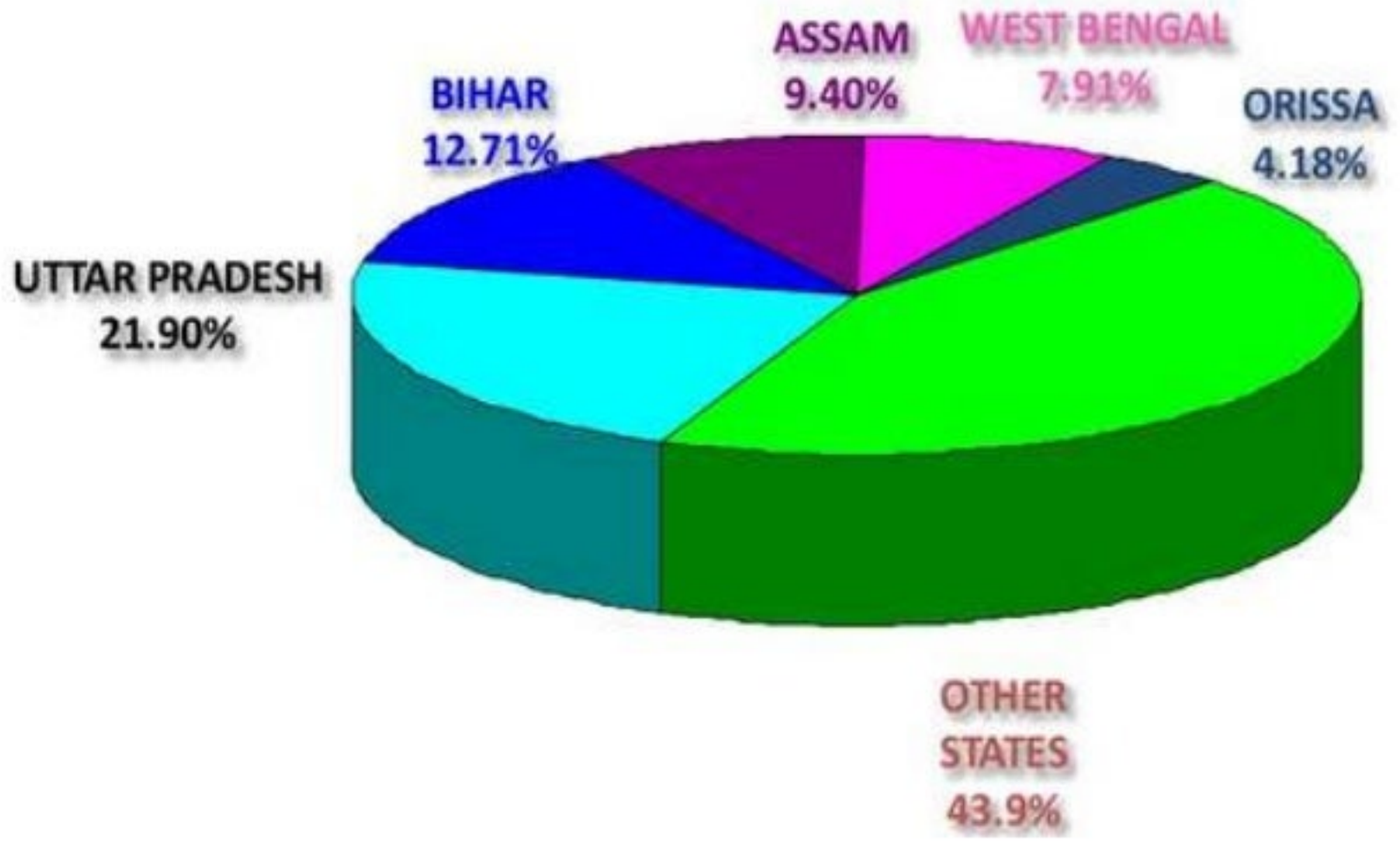
Effects of flood

Primary effect effect

Secondary effect

Tertiary

Flood Prone Areas (M.Ha) in India



Flood management

Cannot be absolutely controlled only managed

Aims of flood management

- Protection of people & property
- Reduction of flood risk
- Monitoring, research, forecasting & warning

Flood management

Hard engineering (Structural)

- Embankments
- Dams & reservoirs
- Channel improvement
- Drainage improvement
- Diversion of flood rivers

Soft engineering (Non-structural)

- Flood plain zoning
- Flood preparedness
- Flood forecasting
- Afforestation
- Public relief

Flood management (Hard engineering)

- Embankments

- Dams & reservoirs

Flood management (Hard engineering)

Drainage improvement

Diversion of flood river

Flood management (Soft Engineering)

Flood plain Zoning

Flood management (Soft Engineering)

Flood preparedness

Environment Agency

Flood management (Soft Engineering)

Flood Forecasting

Indian forecasting network

- Covers major and inter state basins
- 166 stations

Forecasting consists of 4 steps:

1. Data collection
2. Data transmission
3. Data analysis and forecast formu
4. Dissemination

Flood management (Soft Engineering)

Flood Forecasting (contd..)

3. Data analysis and forecast formulation

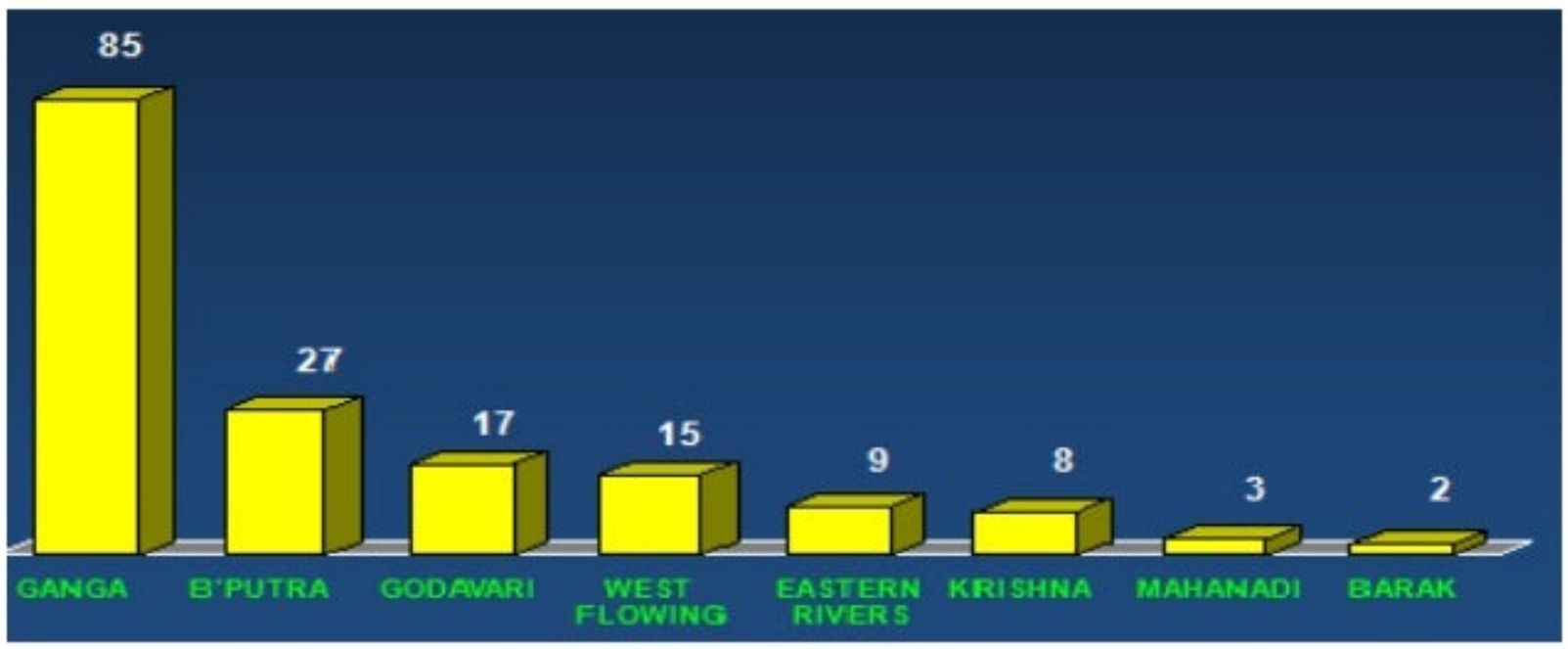
- Estimation of total rainfall from hurricane

$$Estimated\,rain\,(inches) = 100 - forward\,speed$$

Flood management (Soft Engineering)

Flood Forecasting (contd..)

- **Recurrence Interval**: Frequency with which a particular flood height can be expected to return
- Established from past records



- **Recurrence interval** = $\frac{\text{no of peaks in list + 1}}{\text{ranked position of discharge x}}$

Flood management scope

- Use of remote sensing GIS (Geographic Information System)
- Flood forecast (FF) modelling
- Simulation

Conclusion

Although flood is the most deadliest disaster still, but it has some benefits like:

- Recharges ground water
- Fresh water flood help in maintaining food plain ecosystem
- Boost in food production for birds
- Facilitation of weather fish to new habitat

Water water everywhere but not a drop to drink
That is of course until this lovely ship sinks

-Jim(1999)