

## BIHAR FLOOD & DROUGHT

Ques Bihar continues to experience natural disaster like flood & drought on a regular basis. What role can science and technology play in disaster forecasting and management?

⇒ Bihar is one of the most disaster prone states of the country. Floods, drought, earthquake, heat or cold waves, fire incidence etc are various form of disaster prevalent in the state. Among natural disaster, flood is the most common & regular annual phenomenon in Bihar, resulting in enormous loss of life and property. In addition to floods droughts are another constant danger.

⇒ Data regarding Bihar floods & droughts:

A/c to Bihar State Disaster Management Authority (BSDMA)

→ 68800 sq km out of a total area 94160 sq km is estimated 73% of total area in Bihar is vulnerable to flood

→ Bihar flooding annual damage accounts for about 30-40% of the flood damage in India

→ 99.1% of the total flood affected population in India is reported to be located within the state of Bihar



→ 28 districts of Bihar fall under most-flood prone and flood prone district.

→ South & South west Bihar are more vulnerable and often experience severe drought situations.

## \* REASON FOR FREQUENT OCCURENCE OF FLOOD & DROUGHT.

### @ Natural Reason

① Geographical location :- Bihar topography is marked by a no. of perennial and non-perennial rivers. Those originating from Nepal. A majority of the rainfall in this region is concentrated in the 3 months of monsoon during which the flows of rivers increases up to 50 times causing floods in Bihar.

② Climate change :- Association bet<sup>n</sup> El-Nino and La-Ni<sup>n</sup>o event and weak monsoon, erratic rainfall pattern due to climate change has resulted into flood and drought at the same time in Bihar.

③ Changing courses of River :- River Kosi carries tons of silt with them. As silt causes the level of river bed to rise, the straight course of the river is distributed. Therefore, the river changes its course and breaching embankments.



On new path.

## ① Man Made Season / Artificial

① Deforestation :- Destruction of forest for agriculture and human settlement resulted into loosening of soil which in turn increased sediment of river which makes river outflow easily

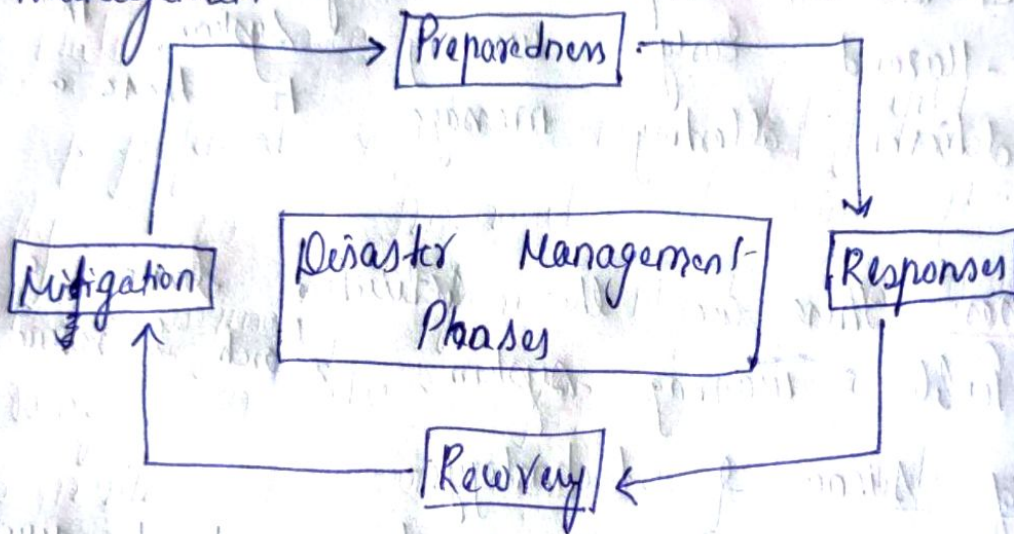
② Water Mismanagement :- As northern part of Bihar is having abundance of water but southern part suffers from severe drought. But there is no provision for management of excess water. At the same time over exploitation of water for irrigation & domestic purposes and cultivation of water intensive crops increases the severity of drought in the various part of Bihar.

③ Population Pressure :- As Bihar accounts for 2.86% area of India but having share of 8.6% population of India's total population. Population pressure driven over exploitation of the surface and underground water resources and other environmental degradation, results in exhaustion of water resources



However, these disaster cannot be avoided completely but can be mitigated and its adverse impact can be limited.

⇒ Science and technology can play important role in disaster forecasting and disaster management.



① Preparedness :-

These are the activities prior to disaster eg - warning system, mock drill, training etc

② Role of Science & Technology :-

↳ Big Data - As flood forecasting & drought forecasting now rely on computer simulation, machine learning with help of big data can help predict the location & severity of droughts & flood accurately.



↳ Remote Sensing Satellites and drones can provide accurate forecasting: - Eg - The data from SCATSAT-1 (launched by PSLV-C35) was used for the detection of the flood situation over India

↳ Use of ICT (Information and Communication Technology)  
- ICT are an imp. and integral component of Multi-Hazard Early Warning System, that monitors and delivers alerting message to those in affected areas

① Response: These are the activities during a disaster  
Eg - Public warning system, search & rescue operation.

② Role of Science & Technology:

↳ Remote sensing satellites & drones - provide quick assessment of damage and people affected so that disaster response can be prioritized

↳ Robots & Drones can be very useful for search and rescue operations in difficult terrain

③ Recovery: These are activities following a disaster.  
Eg - temporary housing, relief camps, medical care & counselling

④ Role of Technology:

↳ Public data like India's Digital ID System (Aadhar)

can help deliver targeted benefit to million of small & marginal farmers affected by droughts or floods

→ Providing relief measures such as food packets, water, medicine through drones

(D) Mitigation:- Mitigation refers to pre-emptive measure taken to reduce the negative impact of a crisis or disaster. E.g - Building codes, Hazard reduction etc.

\* CONCLUSION:- The multi-disaster prone state of Bihar requires a multidisciplinary approach to deal with these disaster requiring participation of various stakeholder and science and technology will play role of catalyst in disaster risk reduction & disaster management of Bihar in upcoming years.