FLOOD CONTROL: DAMS,CANALS AND RIVER LINKING

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INTRODUCTION TO FLOOD

A flood is an overflow of water that submerges land that is usually dry. In the sense of "flowing water", the word may also be applied to the inflow of the tide. Floods are an area of study of the discipline hydrology and are of significant concern in agriculture, civil engineering and public health.

In India about 40 Mha of land is flood prone, which is 12% of the total geographical area of 328 Mha. About 12Mha of the flood prone land has been provided with some reasonable protection against floods by providing flood embankments, drainage channels

CAUSES OF FLOOD

- High rainfall
- Failure of hydraulic structure
- Snowmelt
- Coastal flooding
- Deforestation
- Poor farming
- Overgrazing
- Over cultivation
- Poor water management
- Population pressure

FLOOD IMPACTS

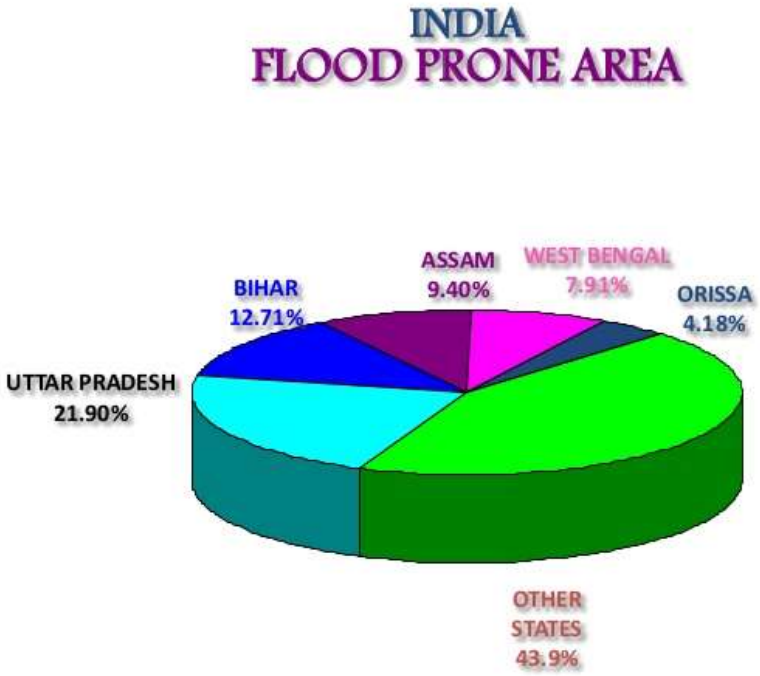
1. **Tangible loss: Loss can be estimated in terms of money value.**

- Personal properties like building, materials etc.
- Loss of crops
- Loss due to disruption of business
- Loss due to disruption of road and railways

2. **Intangible loss: Loss can't be estimated in money values.**

- Human loss
- Disruption of Air / Train / Bus services
- Spread of Water-borne Communicable Diseases
- Communication Breakdown
- Electricity Supply Cut off
- Social Disruption
- Increase in Air / Water Pollution

FLOOD PRONE AREAS IN INDIA

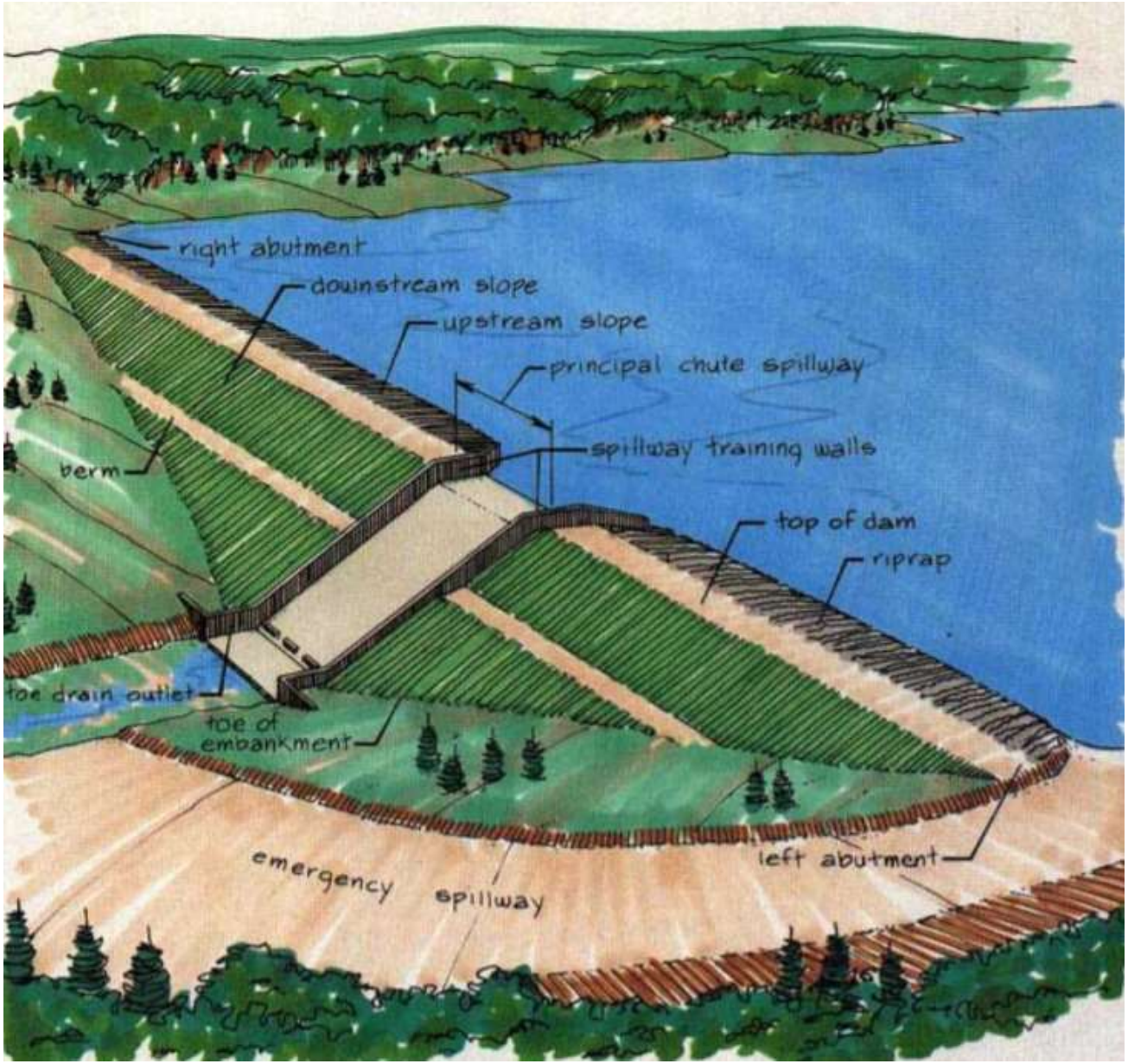


METHOD OF FLOOD CONTROL

- Reservoirs and Dams
- Levees
- Flood walls
- Improvement of river channel
- Diversion of flood water to flood ways
- Watershed management for flood control
- Flood plain management
- Afforestation
- Flood forecasting

DAMS AND RESERVOIRS

- A dam is a barrier that stops or restricts the flow of water or underground streams and A reservoir is an enlarged natural or artificial lake, pond or impoundment created using a dam or lock to store water.
- It can be confusing to talk about reservoirs and dams, as sometimes these terms are used interchangeably. However, dams and reservoirs are two entirely different things. An easy distinction to remember is that a dam is a physical structure that retains water; a reservoir is the water body that is created by a dam.



PARTS OF A DAM

PURPOSE OF DAMS

- The world over, dams are constructed mainly for the purposes of irrigation, power generation, and flood control but It is unfortunate that in both irrigation and hydel projects, flood control is completely ignored.
- It is an internationally accepted practice that the water level of a reservoir should be kept below a certain level before the onset of the monsoon season. This is so that when the monsoon rains come, there is space to store the excess rainwater and also so that water can be released in a regulated manner, thus preventing floods downstream when there is heavy inflow to the dams.
- However, it is unfortunate that the maximum amount of water is stored in reservoirs even before the close of the monsoon and it requires no explanation how the reservoir water was managed in the dams prior to the Kerala floods in 2018.

- Dams and reservoirs can be effectively used to regulate river levels and flooding downstream of the dam by temporarily storing the flood volume and releasing it later.
- Each dam is operated by a specific water control plan for routing floods through the basin without damage. This means lowering of the reservoir level to create more storage before the rainy season.
- This strategy reduces flooding. The number of dams and their water control management plans are established by comprehensive planning for economic development and with public involvement.
- Flood control is a significant purpose for many of the existing dams and continues as a main purpose for some of the major dams of the world currently under construction.
- Some dams are designed specifically for flood protection. These specific dams are usually designed to "reduce flood peaks by 30-50% and allow for downstream areas to be evacuated". In some cases, a dam may have a secondary function that can be used for flood protection. If appropriate planning is undertaken, the level of a reservoir can be lowered to hold back some floodwater.

CANALS

- Canals or navigations are human-made channels or artificial waterways for water conveyance or to service water transport vehicles. It can be thought as an artificial version of a river.

FLOOD MANAGEMENT IN CANALS

- Water levels can be controlled in canals, sending excess water into non-risk areas further downstream, with each lock forming a single linear reservoir.
- Floods can be controlled by redirecting excess water to purpose-built canals or floodways, which in turn divert the water to temporary holding ponds or other bodies of water where there is a lower risk or impact to flooding.

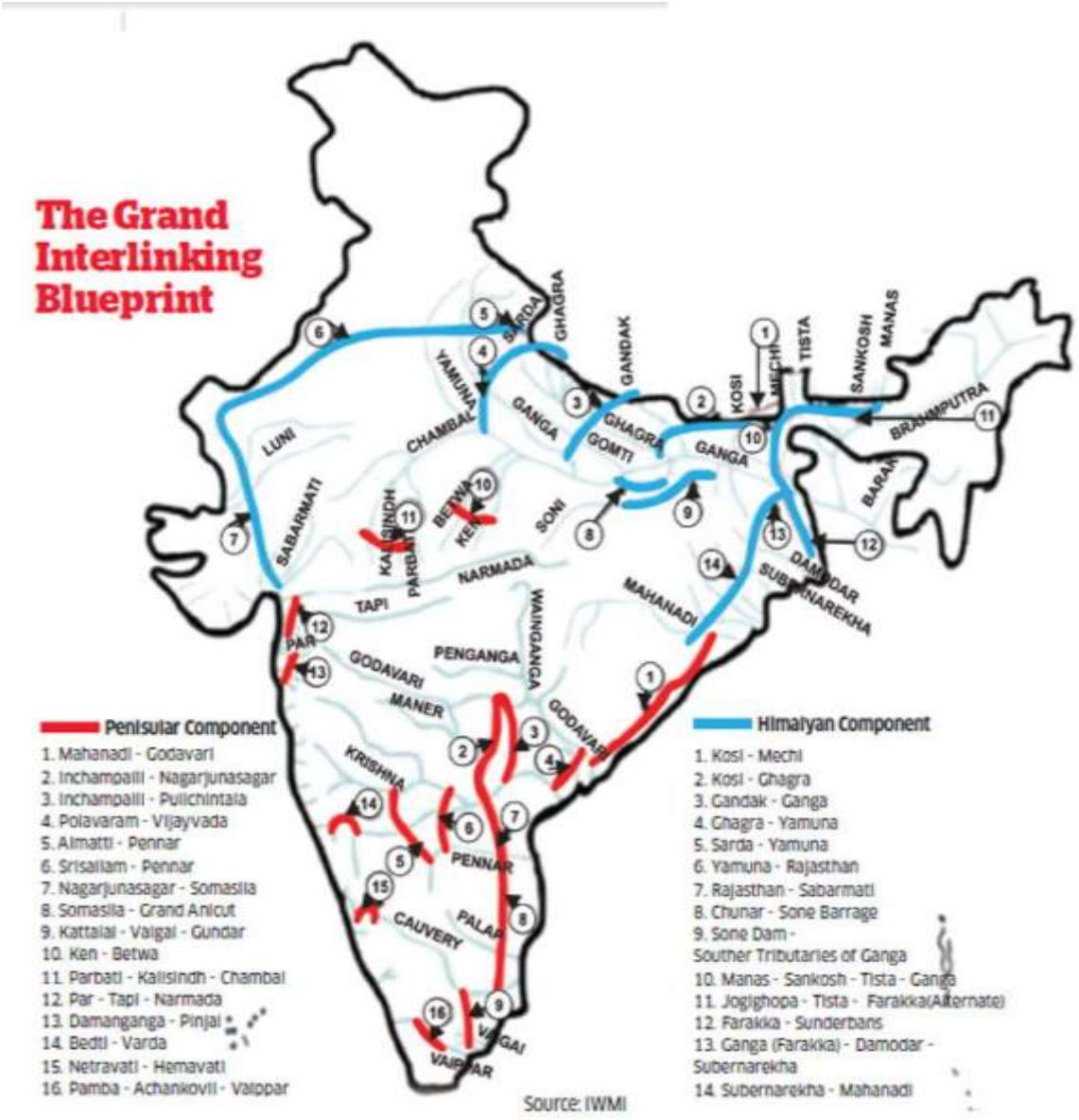
RIVER INTERLINKING

- River Linking is a project linking two or more rivers by creating a network of manually created canals, and providing land areas that otherwise does not have river water access and reducing the flow of water to sea using this means.
- It is based on the assumptions that surplus water in some rivers can be diverted to deficit rivers by creating a network of canals to interconnect the rivers.
- The Indian Rivers Inter-link is a proposed large-scale civil engineering project that aims to link Indian Rivers by a network of reservoirs and canals and so reduce persistent floods in some parts and water shortages in other parts of India.

RIVER INTERLINKING PROJECTS

- Northern Himalayan rivers inter-link component Southern Peninsular component and Intrastate rivers linking component.
- The project is being managed by India's National Water Development Agency (NWDA), under its Ministry of Water Resources. NWDA has studied and prepared reports on 14 inter-link projects for Himalayan component, 16 inter-link projects for Peninsular component and 37 intrastate river linking projects.

RIVER INTERLINKING PROJECTS



NEED OF RIVER INTERLINKING

- Diminish water scarcity in western and peninsular India
- Help in irrigation and storage as a large part of Indian agriculture is rainfall dependent
- Mitigate droughts and floods
- Reduce diversity between the water surplus and water scarce parts of India will create employment
- Will help in socio - economic development of people
- Population and food security
- Navigation
- Current reserves and loss in groundwater level

THANK YOU