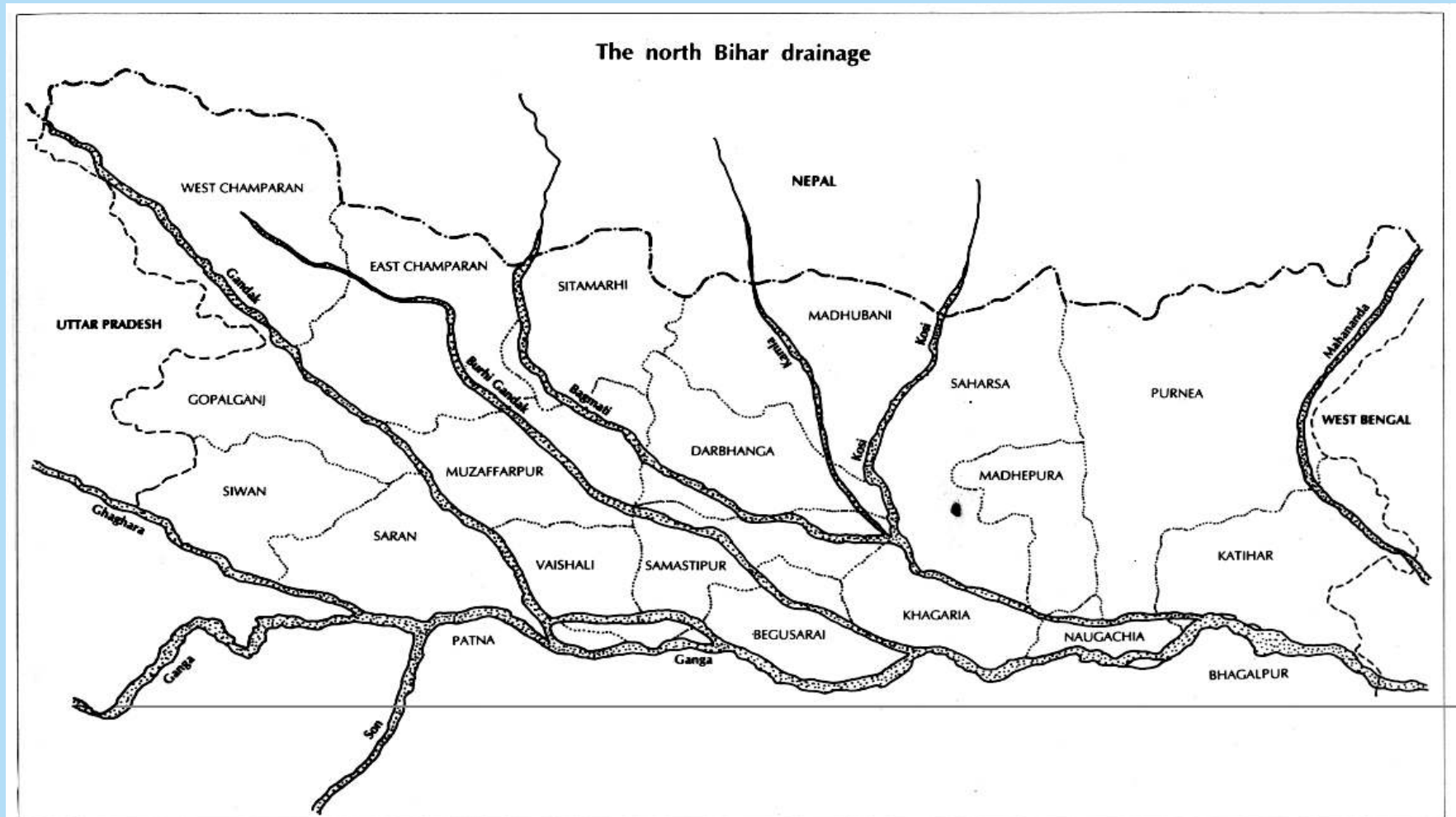


BIHAR's FLOOD SURVIVAL MECHANISM

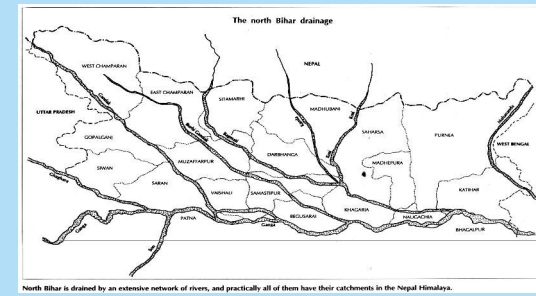
By
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Natural and Social Resource Management

What is there in north Bihar?



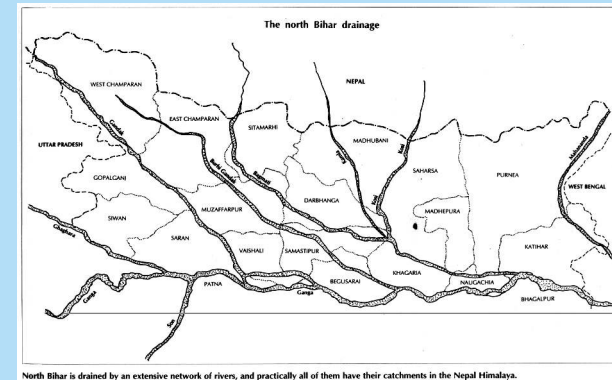
North Bihar is drained by an extensive network of rivers, and practically all of them have their catchments in the Nepal Himalaya.

Brief introduction...



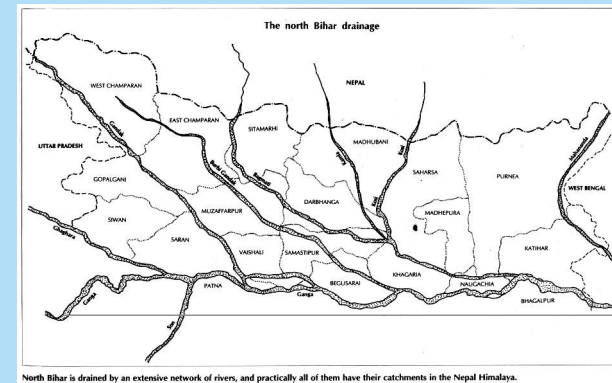
- North Bihar has an area of about **5.4 million hectares**
- Playfield of **eight major rivers** – Ghaghra, Gandak, Burhi Gandak, Adhwara group of rivers, Bagmati, Kamla, Bhutahi Balan, Kosi and Mahananda.
- **16.5 per cent** of the total flood affected area of the country is in Bihar
- **56.5 per cent** of the total flood affected people in the country belong to Bihar. Out of this **76 per cent** reside in north Bihar

Historical facts...



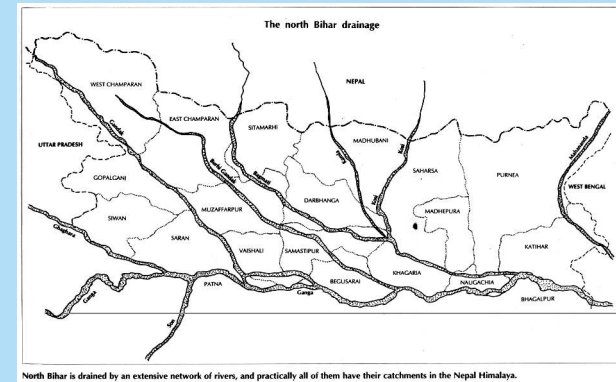
- First public announcement on **6th April 1947** at Nirmali in Supaul district on flood management strategy...
 - Unveiled the plan of constructing a dam on the Kosi at Barakhshetra in Nepal
 - The dam was also expected to irrigate **1.25 million hectares of land and produce 3,300 megawatts (MW)** of electricity
 - During the same meeting, Bhabha had categorically defined embankments as the most **outdated technique** to control floods

Then...



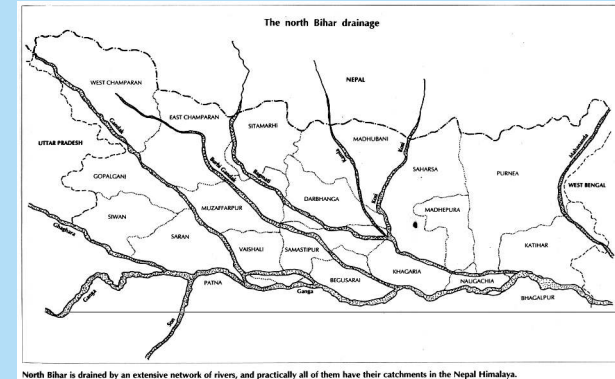
- The estimated cost of the proposed dam in 1947 was **1,000 million INR**, and by the time the groundwork for the dam got completed in 1952, the project cost shot up to. **1,770 million INR**
- The project eventually had to be **shelved** due to the cost factor
- The government preferred to emphasize on **excessive power generation** as the reason for not executing the project. Then the total power generated in the country was 1,750 MW

Later...



- The government **proposed a smaller dam** that was to
 - Produce only 68 MW
 - Irrigate same area
 - Provide smaller flood protection at a cost of **555 million** INR and
 - Construction of **56 kilometres** (km) of embankment between Kusha and Bhagwanpur to prevent westward movement of Kosi
- The second proposal was also **shot down**

And...



- Heavy floods in north Bihar in 1953
- Government grabbed the opportunity to establish its credibility by adopting adhoc flood management strategies

**AND THE GOVERNMENT
PROPOSED...**

...?



TAMING OF RIVERS ...

**HENCE AN OBSELETE TECHNIQUE
ONCE REJECTED BY BHABHA,
GOT POLITICAL LEGITIMACY !!**

Government's ploy!

- On getting the political sanction of constructing embankments, in May 1954, Rai Bahadur Kanwar Sain, Chairperson, and Dr K L Rao, Director, Central Water Power Commission (now Central Water Commission) were sent to China to study **River Hwang Ho**
- It was a strange approach, the decision of constructing embankments had already been taken and the experts were sent to primarily justify the decision.

River Hwang Ho!!

- The embankments of famous Hwang Ho river in China had breached on **1500 occasions**, changed its course 26 times and could not be brought within the embankments 9 times (recorded since 1047 – 1954)
- The embankments has breached **200 times between 1855 - 1954**
- In the floods of 1933, the embankments breached in 50 points affecting **11,000 square kilometres (sq km)** and **killing 18,000 people**

Back home...

- The British government had started to embank **Damodar River in 1854**
- It was to safeguard the railway line between Howrah and Raniganj
- Following the construction of the embankment
 - Natural tanks and lakes in the countryside started dying an unnatural death
 - Impacted the fertility of the soil

‘Their’ strategy!

- The British government was **compelled to demolish** the 32 km long right embankment of the river
- The situation became normal in 1863

Lesson learnt...

- It **does not pay to tamper** with the flow of the river carrying heavy sediments
- Embankments along the river can **result in** **‘a net loss’** in one single incident of their breaching

For us...

The lesson from Damodar was of

NO significance!

**WHAT WAS THE FLOOD
PROTECTION
STRATEGY?**

EMBANKMENTS...

- An **earthen wall** built along the river which divides the landscape into two prominent sections – **riverside and countryside**
- Purpose is to **prevent river water spilling into the countryside** and thereby reducing its impact on human, livestock and agriculture

Government's view

- To control the flow of floodwater by **reducing the area of its spread and hence increasing its velocity**
- Hence, the **eroding capacity** increases proportionately, which **erodes the banks and dredges the bottom of the river**
- This results in adding to the **width and depth of the river**, thereby enhancing the discharge capacity of the river

Common sense...

- Embankments prevent a river from overflowing its banks
- But they also **prevent the entry of floodwater** leading to a major problem of excess water drainage from the countryside
- The situation is aggravated by **seepage from under the** embankments

And...

- **On January 14 1955**, the first foundation stone for controlling the floods in the country was laid in village **Bhutaha of Madhubani district** to control the most forceful river of India – Kosi.
- Once embanking the river as a flood controlling strategy was approved, the other rivers subsequently were embanked in the region.

**ILLS OF TAMPERING
WITH THE RIVER
SYSTEM...**

The non-ending list...

- The natural process of building delta and flood plain gets thwarted
- Raising the water and river bed levels (Embanking Kosi has led to an increase of 2 metres in the lower reaches within 30 years of its construction)
- Occurrence of natural floods have been replaced by human made floods

Contd...

- Excessive water logging – as per state government's report, approximately 0.8 million hectares of land is waterlogged every year, **15 per cent of agricultural land** is rendered useless affecting livelihood of **6 million people**
- **76 per cent of the land** in north Bihar is flood affected and approximately **86 per cent of people** depend on agriculture for their existence

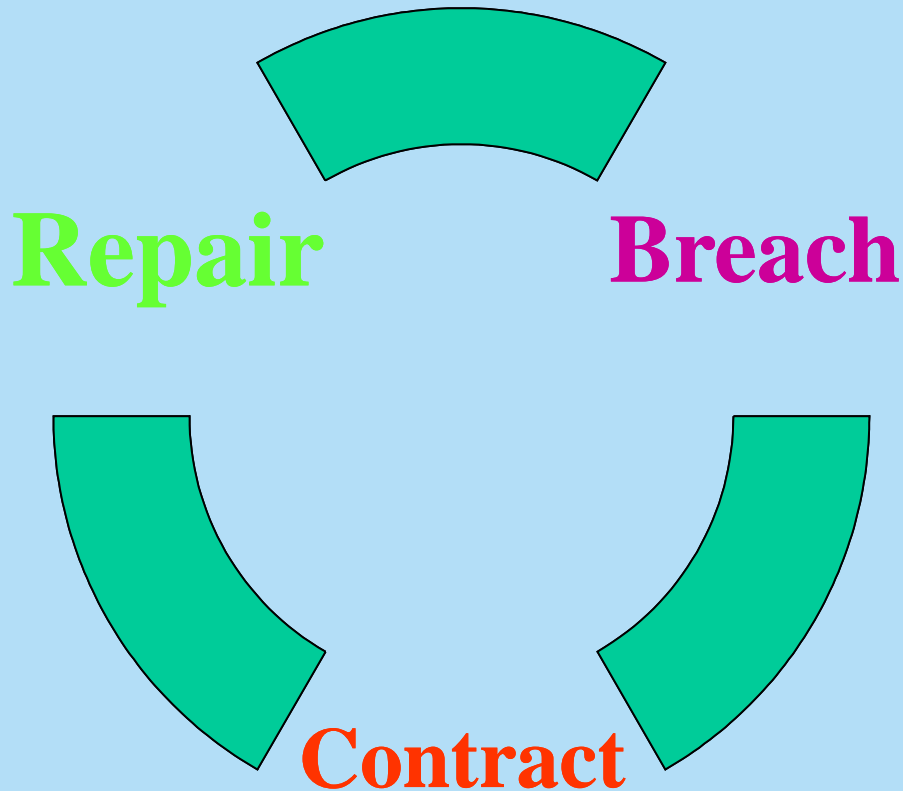
Local interpretation...



Floods in 50s lasted for 4 days and gradually its duration has increased to almost 8 months in a year. This is contrary to the general belief that flood as a disaster is for a shorter duration. Reason : embankments

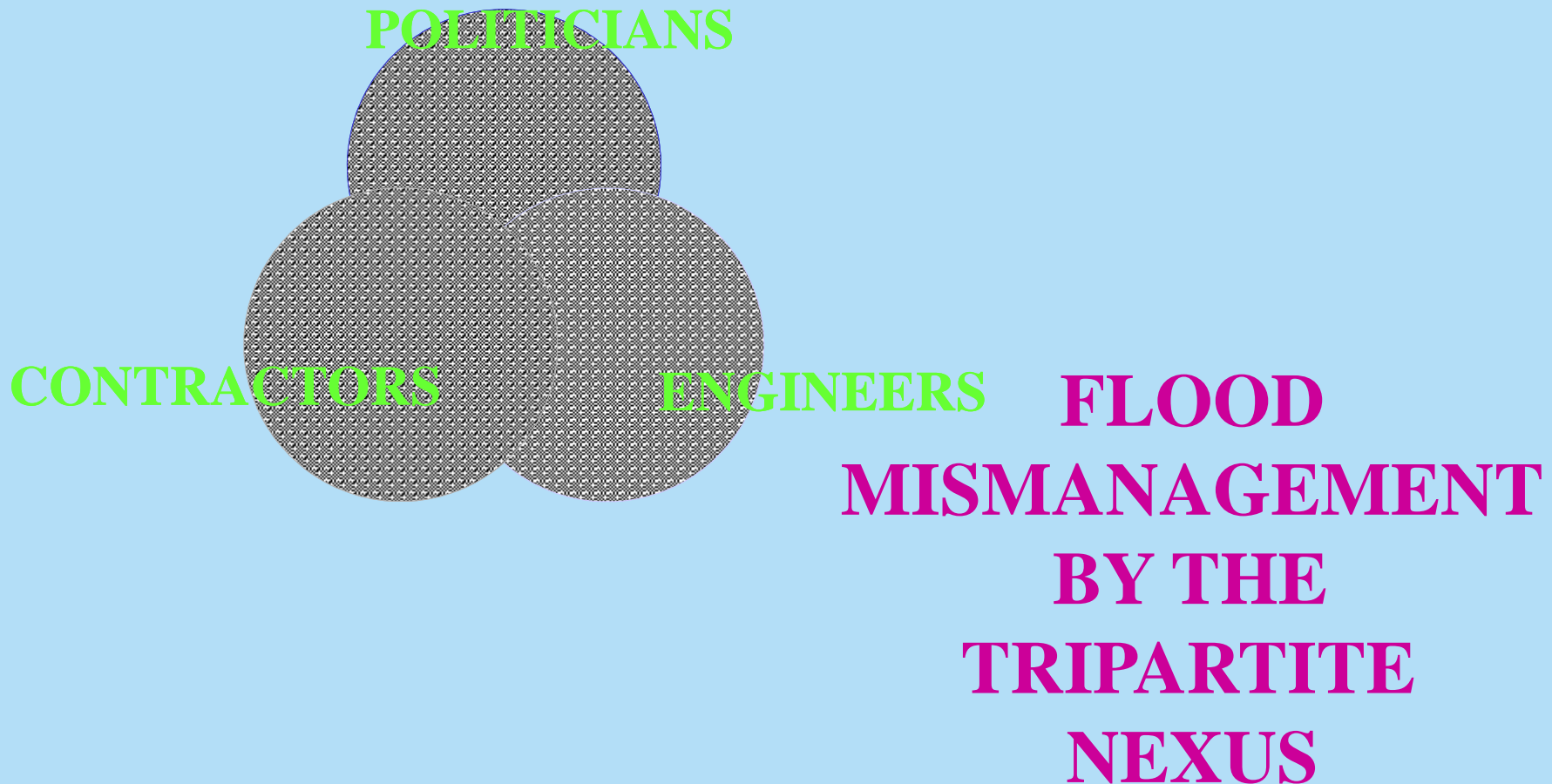
Ameen miyan, Chandrain

Flourishing business ...



**Vicious cycle
that perpetuates
mismanagement
of public fiscal
resources**

Overpowering nexus...



Result...

- In 1952, the state had **160 kilometres** (km) of embankment and the flood prone area was only **2.5 million hectares** (mh)
- In 2002, the embankment is **3,430 km** and the flood prone area of the state has extended up to **6.88 mh**

IMPACT...