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Q16

In what way can floods be converted into a sustainable source of irrigation and all-weather inland navigation in India? (250 words).

UPSC Civil Services Mains 2017 · GS I · 15 marks · Natural Resources and Industries

Distribution of key natural resources across the world (including South Asia and the Indian sub-continent); factors responsible for the location of primary, secondary, and tertiary sector industries in various parts of the world (including India).

Core demand of the question

- Show how floodwater can be stored and steered so that it becomes a sustainable irrigation source and supports all-weather inland navigation in India
- Keep large dams, tanks, floodplains, and waterways in one chain, with ecological limits

Revision summary

Monsoon floods can be stored in tanks, wetlands, aquifers, and reservoir cushions for later irrigation.

Traditional spreading systems and Khadar recharge turn a short peak into rabi water.

National waterways need that stored water and careful barrages to keep draught after the flood.

Embankment-only control raises the bed and fails both goals.

Sediment, ecological flow, and **floodplain zoning** make the conversion sustainable.

Flow diagram

Monsoon flood peak -> Tanks wetlands recharge
Monsoon flood peak -> Reservoir flood cushion
Tanks wetlands recharge -> Rabi irrigation wells
Reservoir flood cushion -> Rabi irrigation wells
Reservoir flood cushion -> Lean-season draught
Lean-season draught -> NW-1 NW-2 barges
Floodplain zoning sediment -> Rabi irrigation wells
Floodplain zoning sediment -> NW-1 NW-2 barges

Conclusion

- Combine tank-wetland recharge, honest reservoir rule curves, and maintained waterways; score success by rabi hectares and barge-days, not by kilometres of new bund.

Floods become a sustainable irrigation source when peaks are spread into tanks, aquifers, and rule-curved reservoirs, and they support all-weather navigation when that stored water keeps a fairway draught on national waterways. The method is living with the pulse of the monsoon river, not sealing it between rising embankments.

Facts & figures

National Waterways Act, 2016

Law that declared a large network of inland waterways, making lean-season draught a national planning issue.

NW-1 Ganga

Haldia-Prayagraj stretch developed for cargo, dependent on depth after the monsoon flood falls.

Flood cushion in reservoirs

Reserved empty storage used to absorb peaks and later released for irrigation and navigation.

Ahar-pyne / haveli systems

Traditional Bihar and central-Indian methods of catching monsoon sheet-flow for paddy and soil moisture.

Floodplain zoning

Land-use rule that keeps room for the river to spread, without which storage and navigation works raise disaster.

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