

Natural capital and floods



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NATURAL ENVIRONMENT RESEARCH COUNCIL



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Concerns of increasing flood risk

Lost natural capital

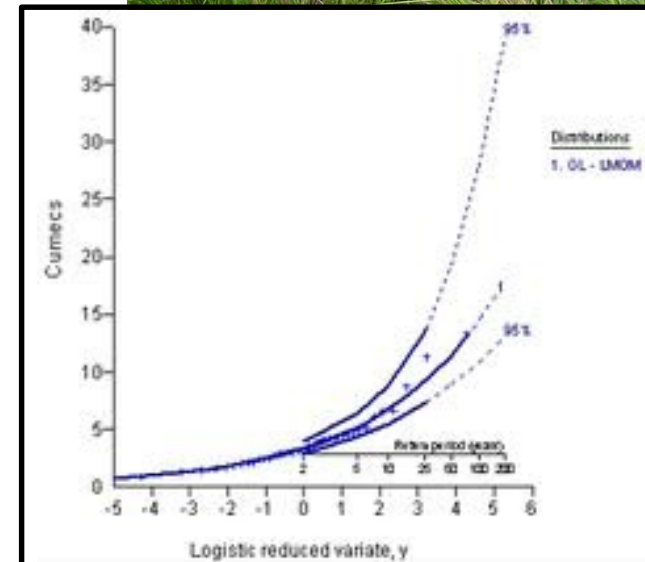
- Wetlands drained
- 90% lost
- Forests removed
- now 12% of UK
- Rivers
- straightened
- 50% are modified



Some hydrological science

What is impact of natural capital loss?

Can restoration reduce flood risk?



Woodlands

rainfall
canopy intercepts
leaves evaporate



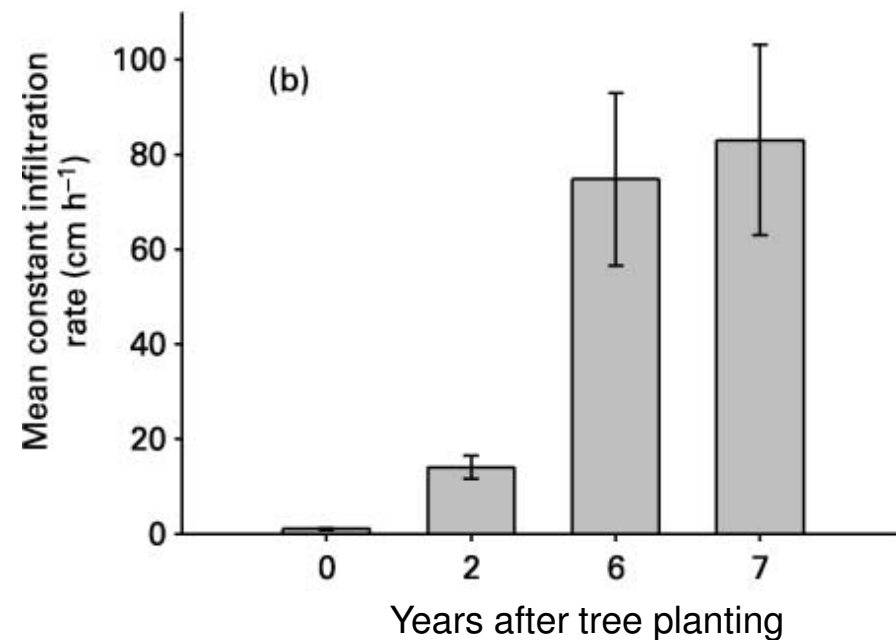
stream flow
roots infiltrate

Response to tree planting

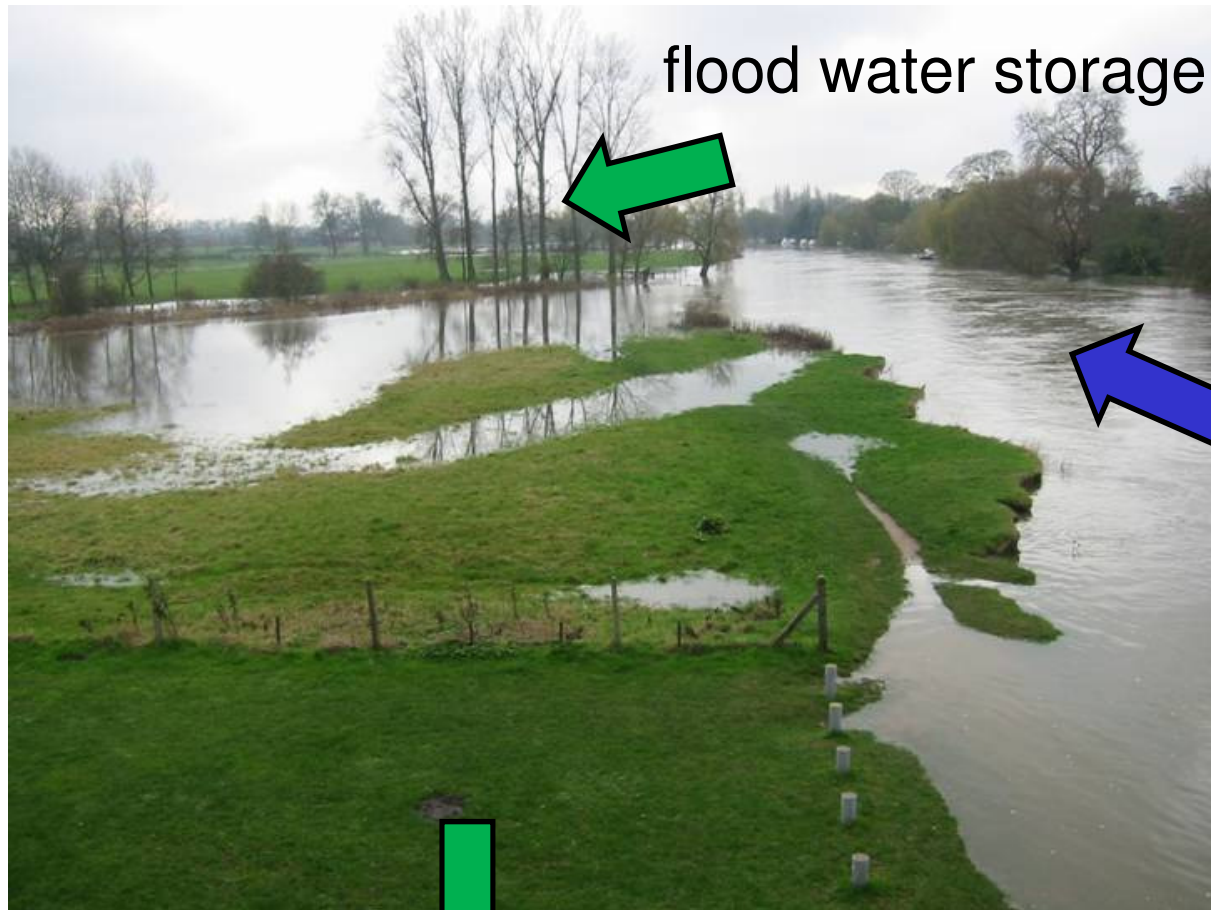
Pont Bren experiment

Increase in infiltration

Reduction in peak runoff



Floodplains

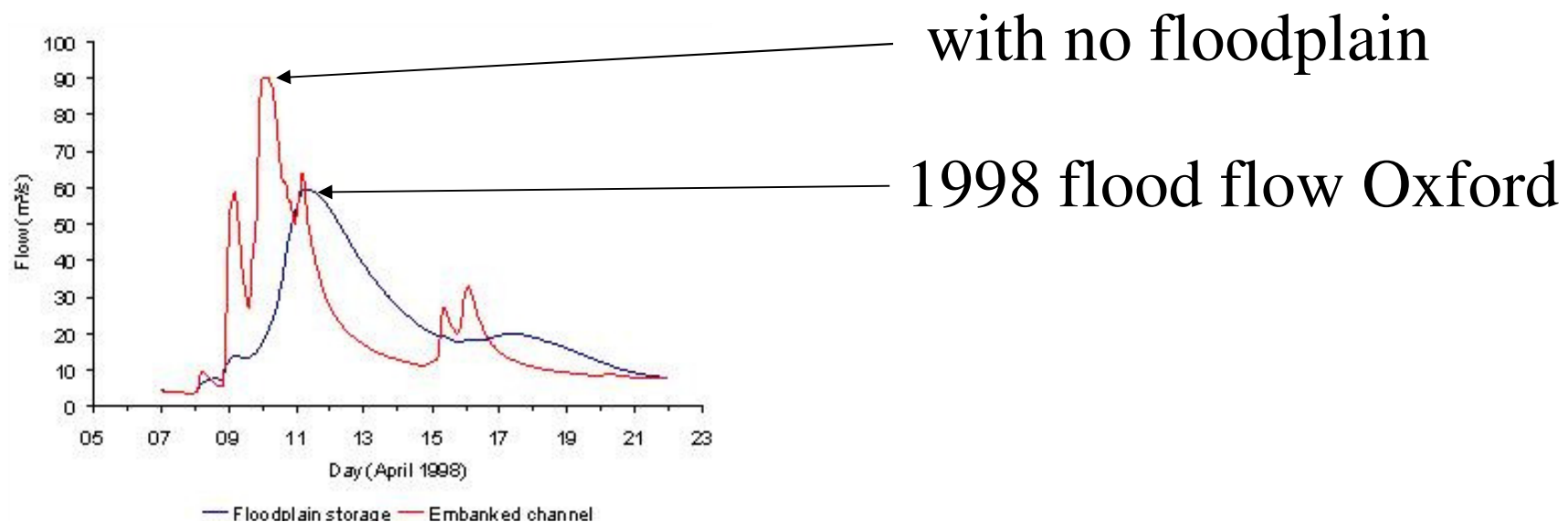


flood water storage

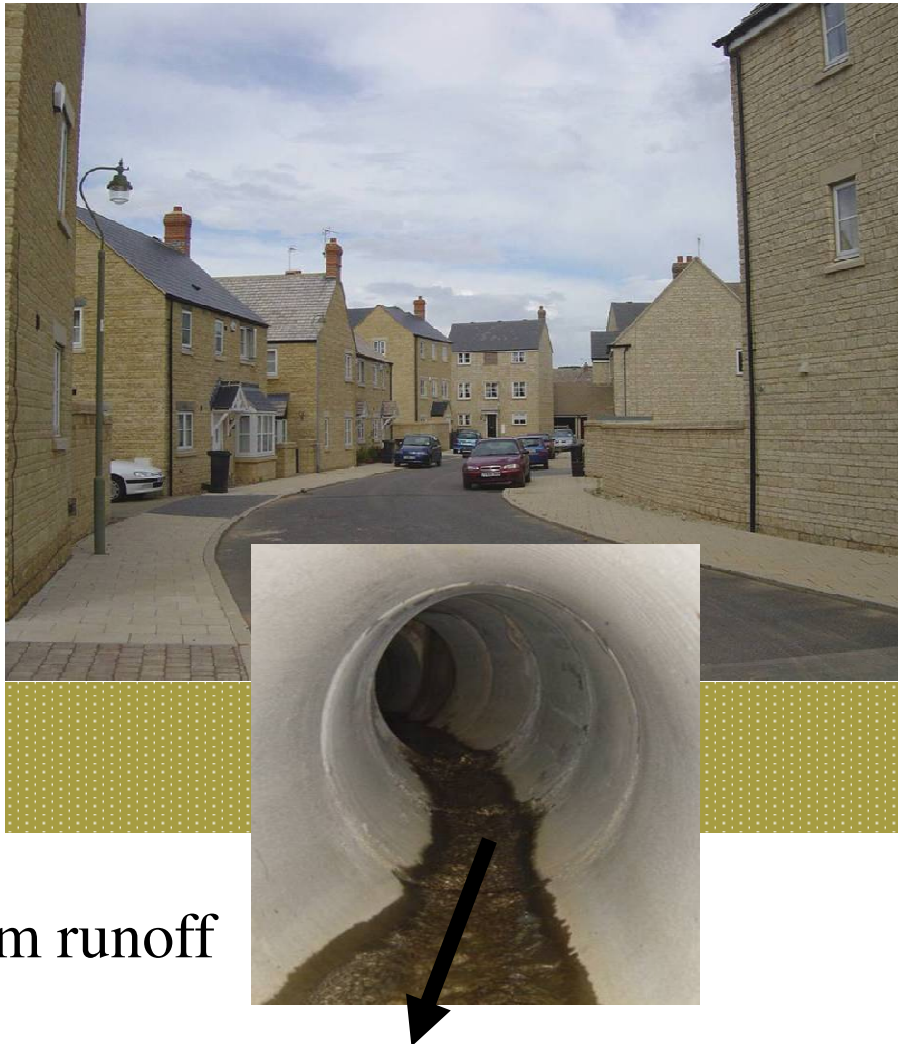
river flow

groundwater recharge

Floodplains and flood management



Urban runoff



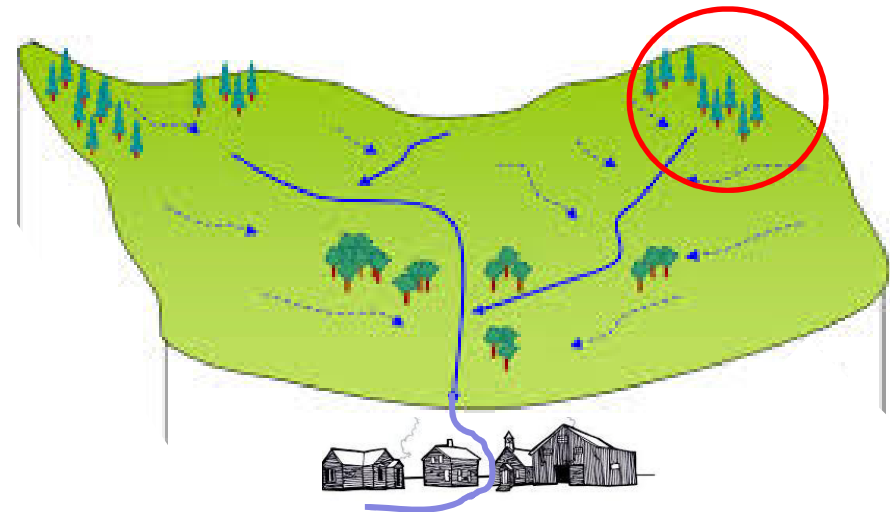
storm runoff



Roadside runoff traps

Scale issues

- Wetlands & forests can have significant impact at **local** level for **small** floods
- Landscape is fragmented – small plots of woodland and wetlands

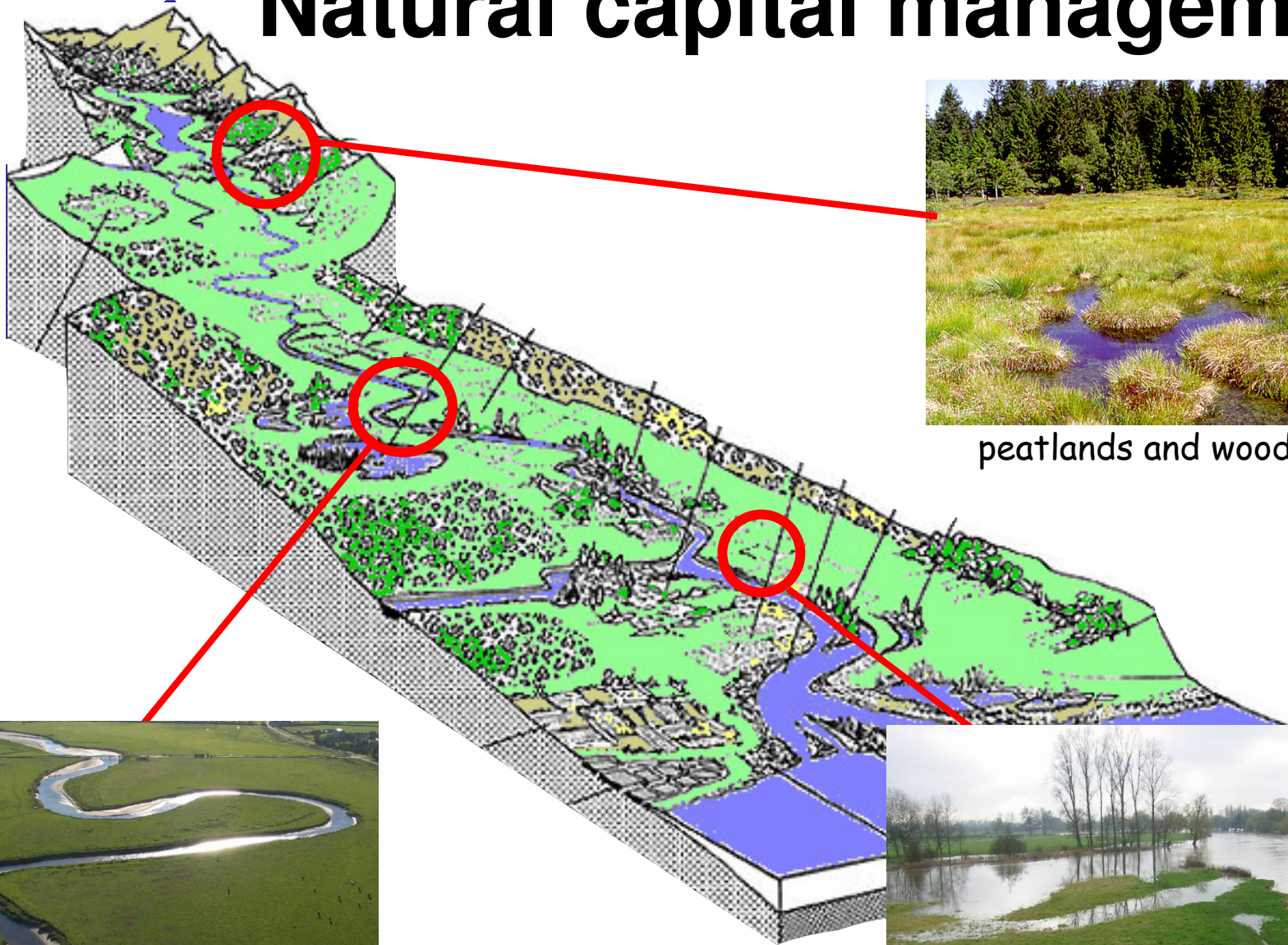


Scale issues

- During major floods, whole catchment is saturated
- Land cover type has little impact



Natural capital management



peatlands and woodlands



meanders



floodplains

Environmentally sensitive flood management structure

- Specific barriers around towns and cities
- By-pass flood channels with high biodiversity
- Flood retention ponds for recreation
- Dams with environmental flow releases



Integrated management



dams



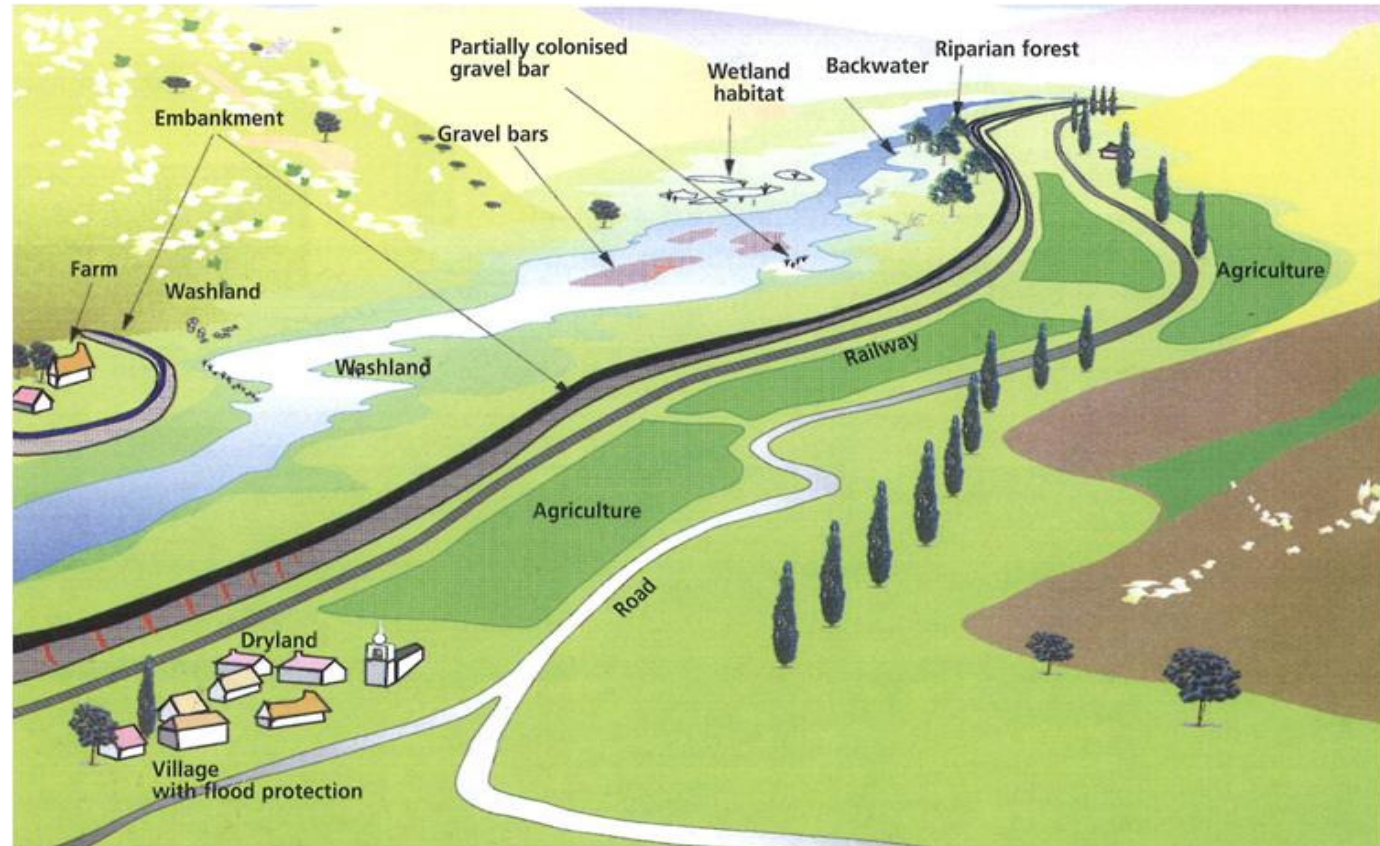
embankments



barrages

Multiple benefits of integrated flood management

- Flood management
- Biodiversity
- Carbon management
- Recreation
- Tourism
- Business opportunity



(Acreman , 2000)

