

# Designing a Sediment Management Program for the Lower Ebro River and its Delta



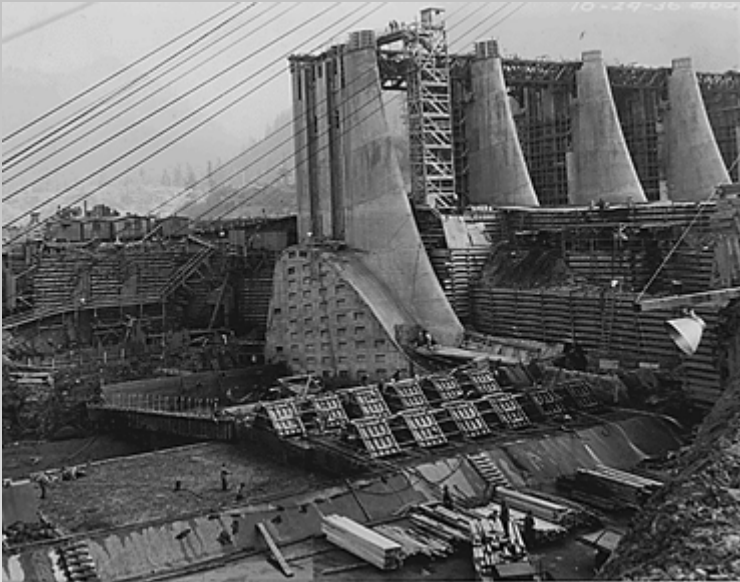
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Dams

Gravel mining



Water pollution



Floodplain occupation

# The Lower Ebro River and Delta

## Mequinença dam

Length: 84 km  
Capacity: 1534 hm<sup>3</sup>  
Built in: 1966 year

## Riba-Roja dam

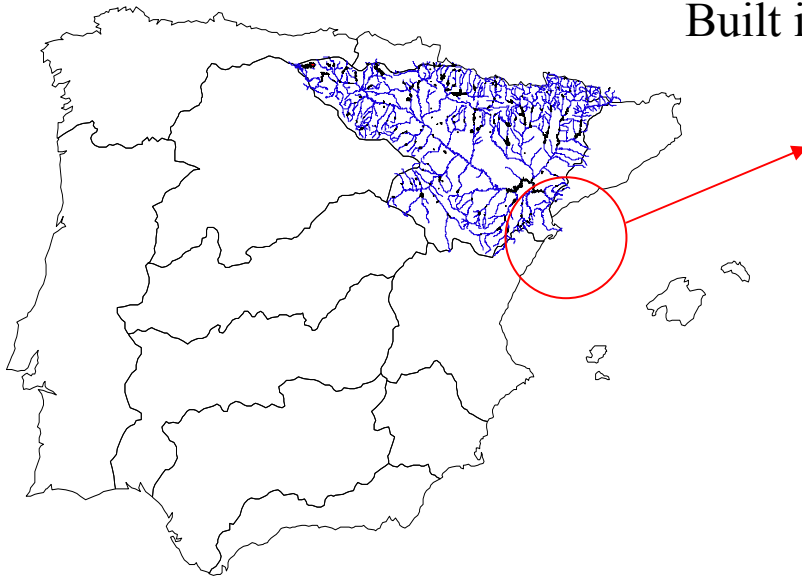
Length: 30 km  
Capacity: 210 hm<sup>3</sup>  
Built in: 1969 year

## Flix dam

Length: 13 km  
Capacity: 11 hm<sup>3</sup>  
Built in: 1948

## Irrigation channels

Capacity: 50 m<sup>3</sup> s<sup>-1</sup>



0 300 km

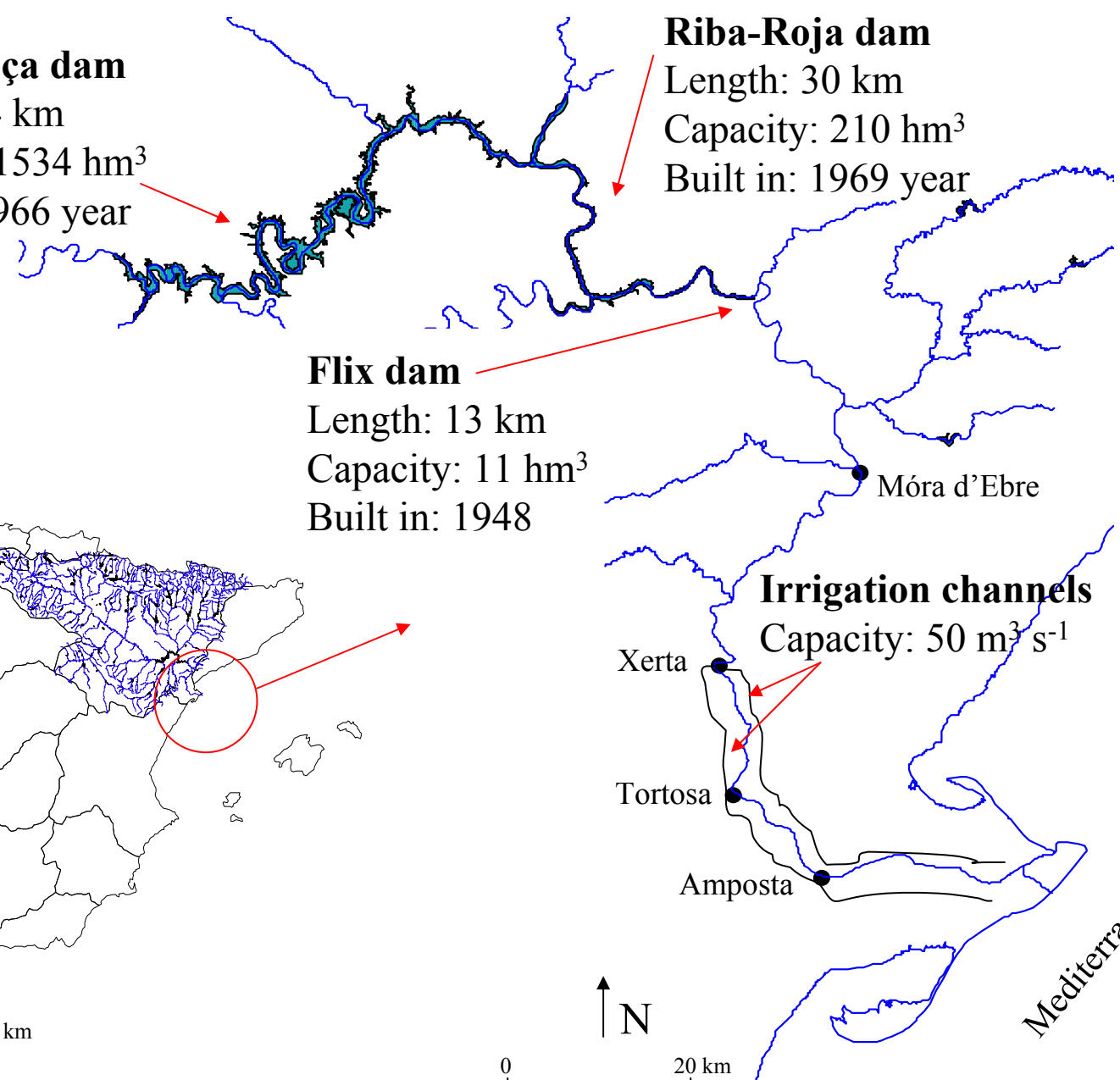


0 20 km

Mediterranean Sea

Xerta  
Tortosa  
Amposta

Móra d'Ebre

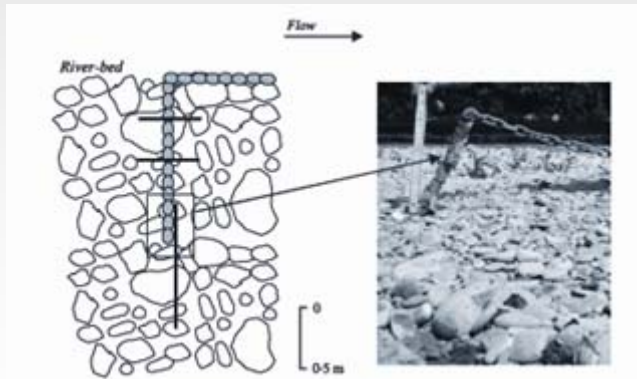




# The recent past and present of the Lower Ebro River and Delta

**From 1969 to the present-days:**

- Dam construction
- Alteration of hydrological regimen
- Disruption sediment transference
- Delta reshape



Channel incision (Vericat & Batalla, 2006)



Main areas of erosion and accumulation in the Ebro Delta

# **Towards a new sediment management plan**

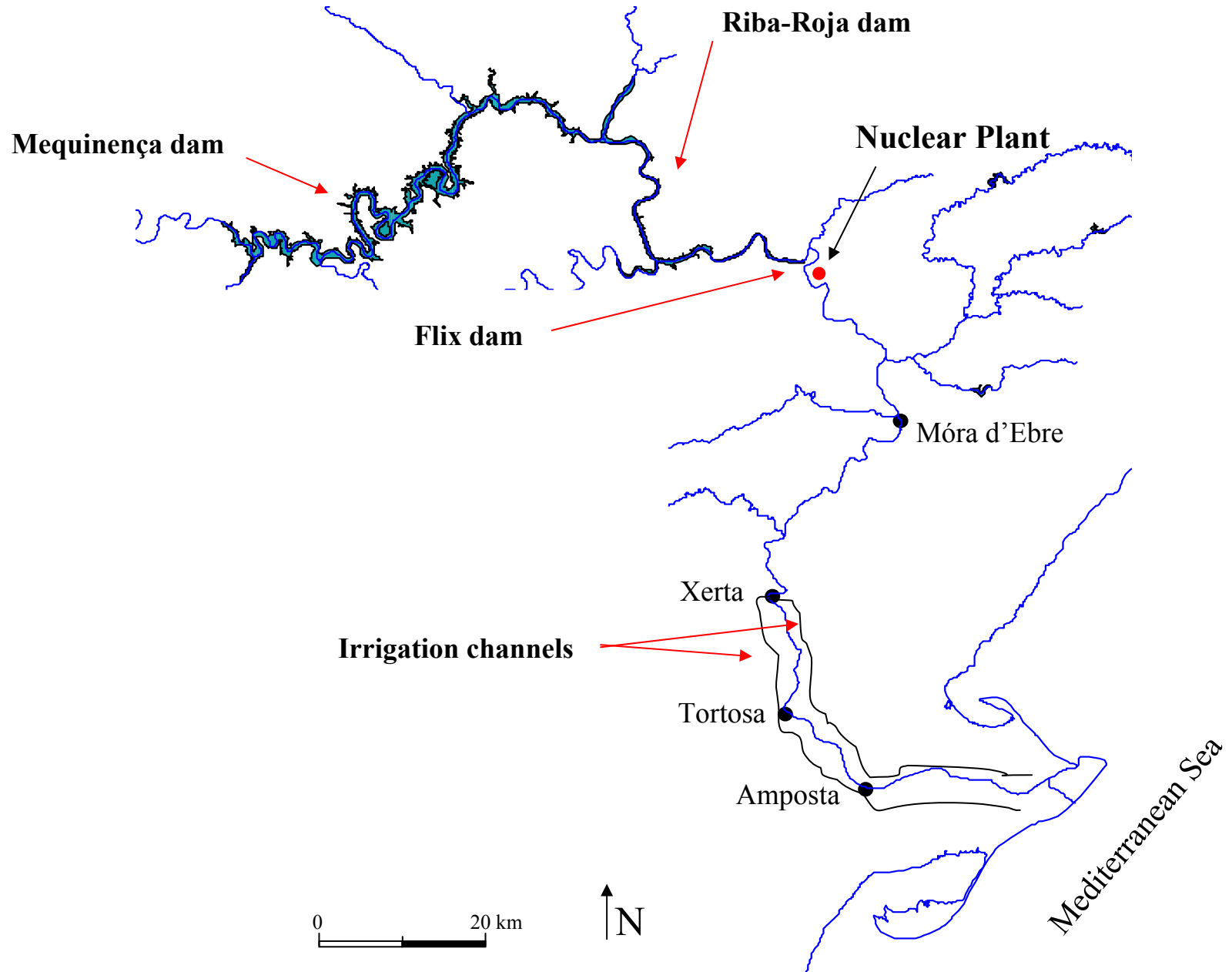
## **Main goal**

Develop a new water and sediment fluvial regimen in order to mitigate the present impacts.

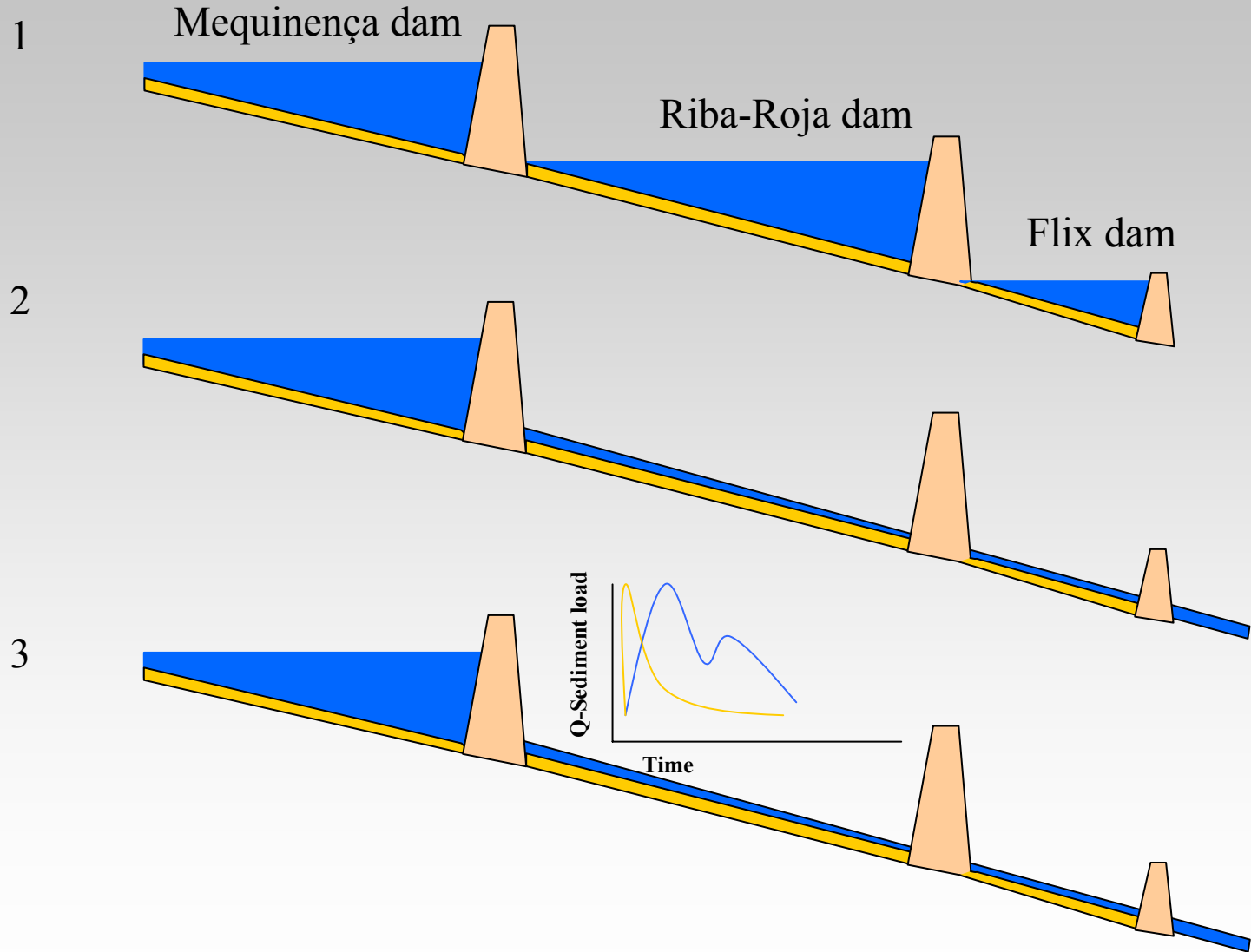
In detail:

- Minimize the sediment unbalance between the River and Delta
- Reduce the riverbed erosion (channel incision)
- Stop the coastal retreat of the river mouth
- Minimize the regression in other coastal zones of the Delta

# Sediment management plan approach



# Flushing Procedures



## **First steps**

- Analysis of the sediment stored into the Riba-Roja dam
- Study of the technical procedures, economical costs and estimation of the environmental impacts
- Designing flood hydrographs
- Development of a sediment transport model
- Constructing the new hydrological and sedimentological regimen



## **Main obstacles**

- Technical constrictions
- High environmental impact
- Political-social conflicts

## **Final Remarks**

- Need for development of sustainable management plans
- River basin as a unity linking river and marine-coastal processes
- Collaboration between scientific, administration and private organizations
- Application of new or alternative approaches
- Sediment: key for the sustainability of the river and delta systems