Technology and Global Development
An example

A Water Development Plan for Java - Indonesia, 1970's

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Water Development Plan for Java

Dream or Reality?

Dream to **connect** irrigation systems all over Java in order to bring water from the wet West to the dry East

Including a main canal throughout Java and – through a siphon – to Madura (over 1000 km)

Big reservoirs with pumping stations to overcome differences in height

Water Development Plan for Java

Aims

Water control

- Irrigation possibilities for three rice crops

Canals

- For transportation
- To stimulate industrialisation
- To control erosion
- To strengthen Java's competitive position towards Singapore

Was the plan to connect irrigation systems realised?

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Project Elements

Work in progress

1929

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Project Elements

Dam in the Tjisadane River

What you see, from the plane when you fly into Jakarta

Constructed in 1934, photo 1995

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Project Elements

Dam in the Tjisdane River

The same dam,

ground level

Constructed in 1934, photo 1995

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Dam in the Tjitaroem River

Constructed in 1925
(photo 1938)

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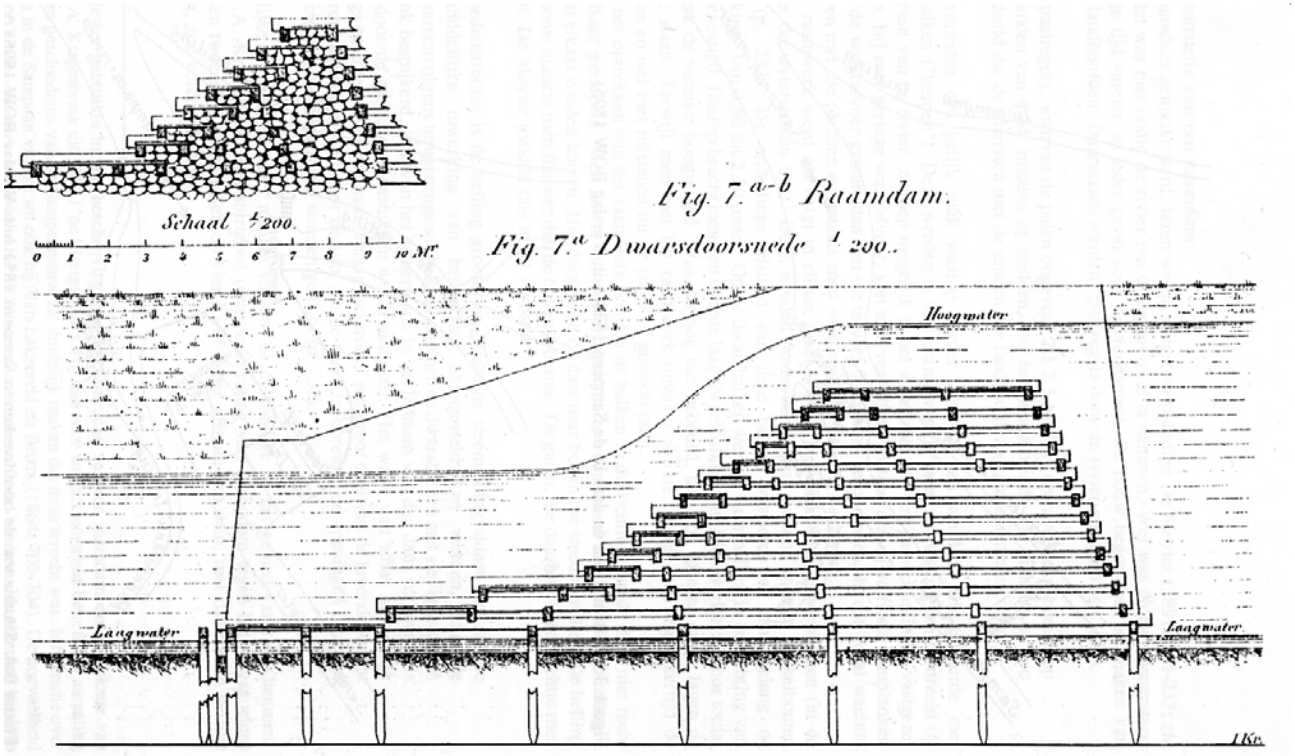
Project Elements

Sketches of the first dam in the Sampean River



Constructed in 1832

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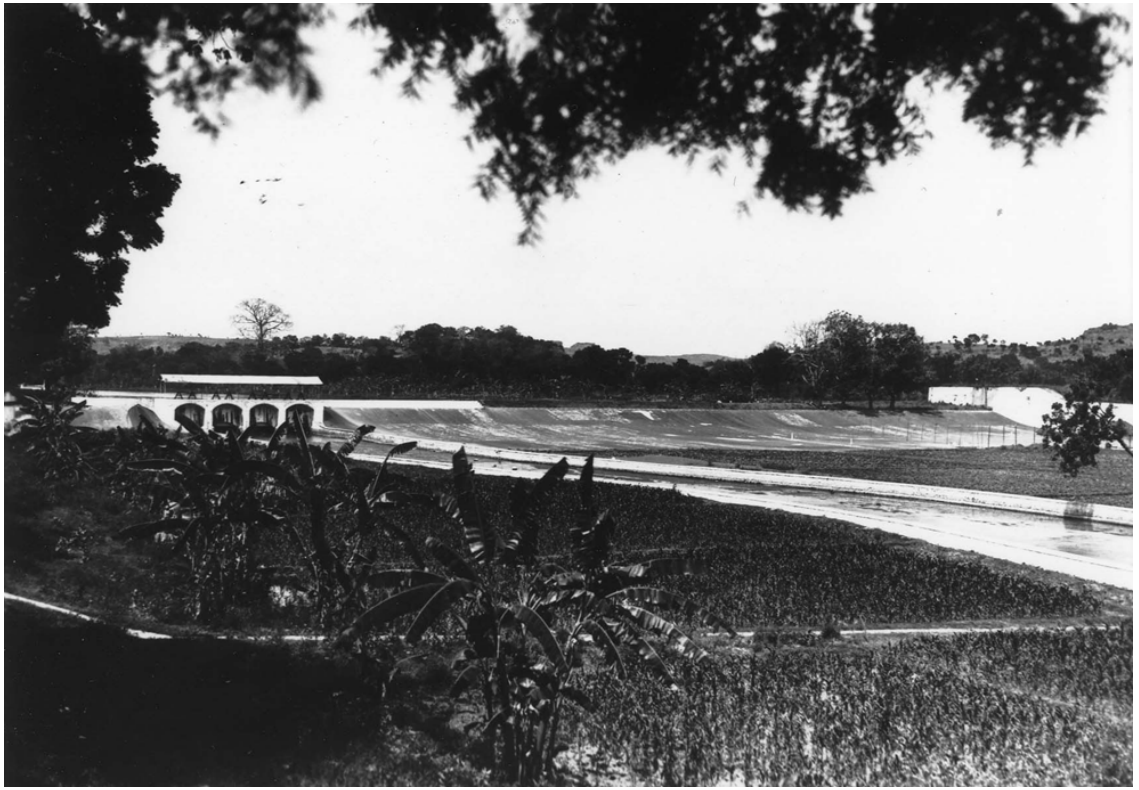
Projects Elements

The Sampean River- dam with drainage sluice:

how initial sketches developed

Construction in 1876 and 1900

(photo 1932)



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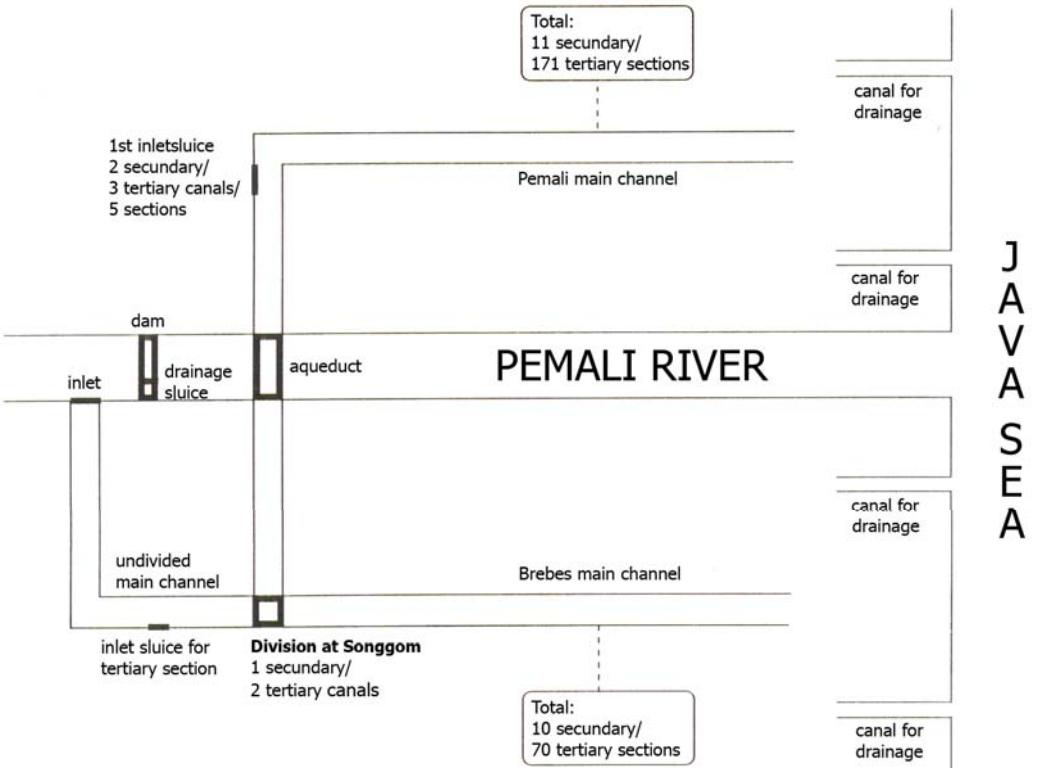
Project Elements

Pemali irrigation system

Devising a larger system to connecting systems

Constructed in 1896



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Project Elements

After constructing main parts of the structure (dams, irrigation systems) reservoirs were developed and created

1931

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Project Elements

Looking down from the reservoir in the previous slide onto the head canal leading away from it

1931

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Projects aims

Planting out of Rice Seedlings

1900

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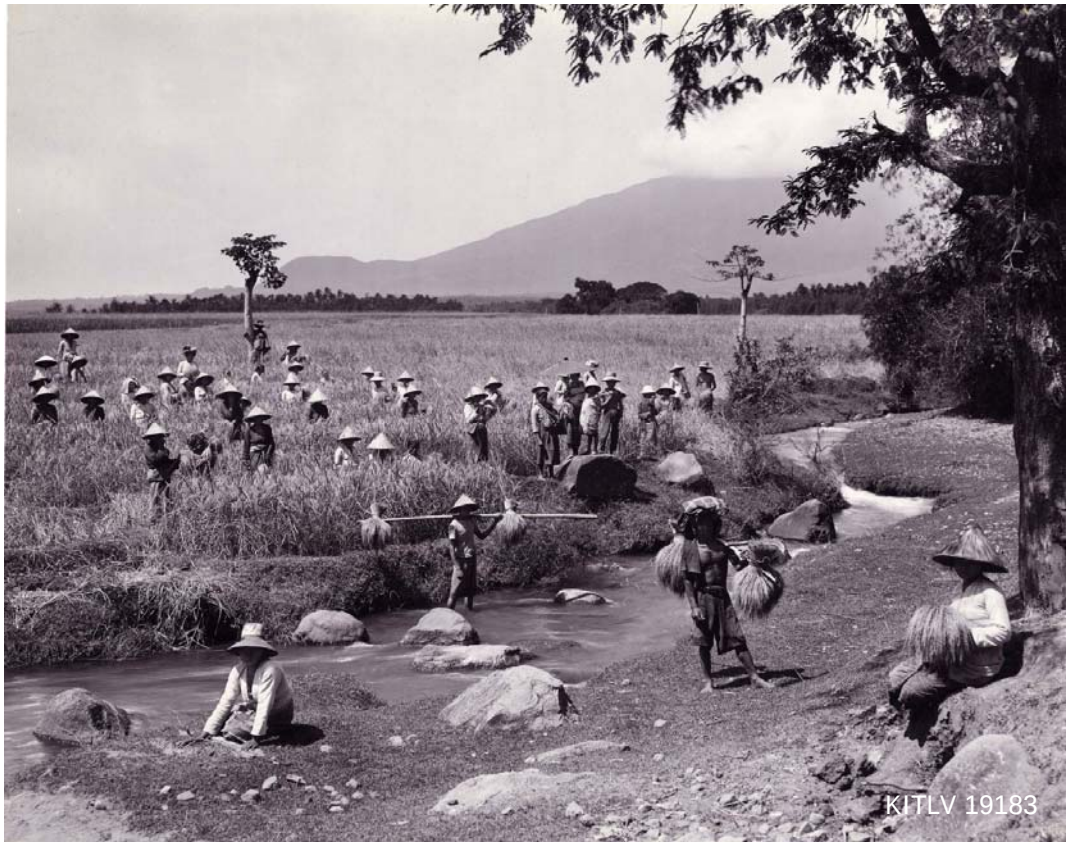
Project aims

Rice harvest



1920

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Consequences- Social Disadvantages

Reservoir construction caused

"Transmigrasi"

Moving landless people from densely populated area's to other Indonesian islands causing cultural rivalry and violence between settlers and the indigenous population

map from http://www.thalassa.net/images/Map_Indonesia_C.jpg

Who benefits from modernisation?

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Consequences- Ecological Disadvantages

New breeding ground for water related parasites causing bilharzia and malaria

Big reservoirs stimulate erosion

Sedimentation in reservoirs

Water plants will obstruct navigation

Economically feasible?

http://www.travelplaces.co.uk/images/A1_grand_prix/indonesia-rice-paddy.jpg

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Realisation

What do you think: has the plan been realised or not?

Why has it (not) been realised?

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Analysis

Several angles to look at the case:

- Actor analysis
- Technology: artifacts, complex artifacts, technical systems
- Technology + social context: sociotechnical systems
- Technology + cultural context: technological regimes

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Actor Analysis

Getting a structured overview of the involved parties (individuals and groups) and their interests.

Which relevant groups are involved?

What are there perceptions?

What influence or power do they have?

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Technology

What technologies are used?

Irrigation systems: hardware

- Sluice doors
- Weirs
- Canals
- Division structures etc.

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Sociotechnical Systems

How do technology and social context interact?

Systems of irrigation and water management

Connected systems in irrigation areas or in river basis

One system of irrigation and all actors, regulations, education facilities etc. involved

Important: systems approach, system dynamics, system innovation

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Technological Regimes

To consider:

Exploitation

Welfare

Industrialization and development

Important: mind-set, regime transformation

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Conclusions

Technological Regimes

Regime transformation:

Sociotechnical Systems

System innovation:

Actor analysis

Opinion key players:

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Conclusions

Technological Regimes

Regime transformation: from welfare to industrialization

Sociotechnical Systems

System innovation: scale of operations increased

Actor analysis

Opinion key players: National- YES

International- NO

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Conclusions

Internationally there was no willingness to invest

Despite advantages, national enthusiasm etc. social end ecological disadvantages were considered more important by international investors who were needed to finance the project.