Social, Political & Institutional Aspects of Water Resources Engineering and Management

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Content of the workshop

1. General introduction
2. Definitions
3. Examples from own experience
   - Ganges delta - Bangladesh & India (floods and droughts, water sharing)
   - Titicaca Lake - Bolivia & Peru (floods and droughts, water sharing)
   - Mississippi (USA), Var (France) …
4. Discussion
5. Your presentations

Water Management

- Too much or too little water; July 2005:
  - Flooding in India and Romania
  - Shortage in Niger, France, Portugal, Spain
- Response = Engineering+Management
- Engineering came first, with clear benefits (among other social): making the water resources available when needed for human consumption, agriculture and so on,
- But …

Why this workshop?

Social, political and institutional aspects of water resources engineering and management, but

- What kind of:
  - Engineering and
  - Management

  are we talking about?
- Why to talk about social, political & institutional aspects, why not about environment, legislation, ethics …

Why this workshop?

- What is a:
  - Social aspect?
  - Political aspects?
  - Institutional aspect?
- Why are they important/relevant for water resources engineers and managers?

Definitions

You help me in finding out about the different aspects

Water engineering?

- Engineering was developed for managing water, not only as a resource, it exists since millenaries :
  - Mesopotamia
  - Roman empire
  - American Indians
- Did they have also social, political and institutional problems?
- Why have these issues become so important nowadays?

Water engineering?

- What kind of engineering?

Water engineering?

- What kind of engineering?
  - For improving water quality
  - Damming - Hydropower production
  - Flood control structures
  - Barrages - Headworks
  - Canals and canalization
  - Water intakes
  - River training (multi-purpose)
  - Water distribution systems
  - etc

Social aspects?

- What kind of social aspects?

Social aspects?

- What kind of social aspects?
  - Resettlement - displacement
  - Water access - water rights
  - Ability to pay - income - cost of water
  - Stakeholders participation - gender - (de)centralization
  - Privatization
  - Health
  - Indirect through environmental impact
  - etc …

Political aspects?

- What kind of political aspects?

Political aspects?

- What kind of political aspects?
  - Trans-boundary rivers
  - Conflicts about water sharing
  - Internal conflicts between users
  - Conflicts between managing authorities
  - Politics intervening in the management
  - Political changes impacting on long-term strategies
  - Political situation - good governance
  - Corruption etc …

Institutional aspects?

- What kind of institutional aspects?

Institutional aspects?

- What kind of institutional aspects?
  - Capacity building
  - Information to the users and managers - dissemination
  - Awareness - preparedness
  - Political setting
  - Laws and implementation - local traditions and laws
  - Local knowledge - cooperation and dialogue

etc …

More important now?

- Possible reasons?

More important now?

- Possible reasons?
  - Demographic pressure and limited resources
  - Climate changes (variability?)
  - Engineer not anymore the sole actor
  - Environmental impact affecting humans
  - Globalization and privatization
  - And other …

Pause

First discussion

What is your opinion

Your presentations …

- Presentations of cases in your own country or area
- Highlight the social, political and institutional aspects
- Do not emphasize the technical aspects
- You may discuss other aspects, such as legal, environmental or economic if there is a clear link with the social, political or institutional ones

My presentations …

- Presentations of cases I have been working on in Europe, Asia, South America, may be Africa:
  - Titicaca Lake (Bolivia & Peru)
  - Ganges Delta (Bangladesh)
  - Var river (France)
  - Senegal river (Mauritania & Senegal)

  serve for commenting the aspects, rather than as an example

The Titicaca Lake

- A case study
  - Inundations in 1986 in Peru (Titicaca) and Bolivia (Titicaca, Uru-Uru & other)
  - Project started because of emergency situation
  - European Commission agrees to fund:
    - Emergency works
    - River Basin Master Plan
  - Opportunity to solve the water sharing problems between Bolivia and Peru

Political Issues

- Historical

  During wars, Bolivia lost its access to the sea and relies on the goodwill of Peru or Chile to access sea ports

- Water use
  - Peru: Immigration to the borders of the Titicaca Lake because of fertile(r) land
  - Bolivia: Emigration from the catchment because of crisis in mining sector and because of shortage of water resources and fertile land

Political Issues

- Political solution (pursued since the fifties)

  Possible deal: water for free access to sea

- Role of donor
  - Helping assessing the amount and variability of the water resources
  - Assisting in finding ways for better use of the existing water resources
  - “Favouring” the set up of a bi-national management body

Social (& Socio-economic) Issues

- Local indigenous population discriminated
- No re-conversion plan after closure of most mines
- Foreign investment in mining sector with all profit to the investors and little for local population
- Natural and anthropic contamination of water resources (Serious health hazards)

Institutional Issues

- Little and poor cooperation between Bolivia and Peru in hydrology and water resources assessment
- National hydrological services lacking human and financial resources
- Decision-making about water uses in hands of politicians and most powerful stakeholders (agriculture)
- No real participation of indigenous groups

Outcome of the Project

- Floods were the exception and drought is the main issue
- Quantity of water resource is strongly dependent on climate and its inter-annual variation and is limited to only 35 m^3/s (much less then demand and much < previous estimates)
- Water quality is a serious problem and restricts some of the uses (fisheries in Bolivian Popoo Lake)

Outcome of the Project

- Archaic indigenous technology for optimum use of water resources can be a solution for agricultural production instead of traditional irrigation (which gives salinization through evaporation and prone to frost damage)
- The water resources can be managed with hydraulic structures`
- Bi-national autonomous authority for managing the catchment “ALT”

The Ganges Delta

- A case study
  - Catastrophic inundations in the Ganges Delta in 1987 and 1988 (respectively 40% and 60% of the country under water)
  - First relief was not coordinated
  - Bangladesh asks international community for help, to be coordinated by World Bank
  - G7 meeting in Paris agrees with “Flood Action Plan” (FAP), 26 projects, budget 146 Mio USD

The Flood Action Plan

- Initial goal: finding means to “tame” the rivers of Bangladesh
- Did not take into account the fact that local farmers consider a flood as a gift of God, because of its beneficial effects: fertilizing the land, filling the ponds, on fish stocks

The Flood Action Plan

- In the 26 projects, very little was devoted to social aspects, people's participation, institutional reforms
- The supporting projects aimed at creating centres of excellence (GIS, numerical modelling, etc …) little attention for capacity building in basic activities
- Local knowledge was not properly recognized from the start

Political Issues

- Most donors were interested by projects that could have a return
- Other projects were left and finally taken up by “neutral” donors (e.g., E.C.)
- Difficulty to collaborate with India for data on rivers flowing to Bangladesh
- Politicians and contractors (+ expatriate experts) wanted funding of projects, insisting on the negative impact of extreme floods

Social Issues

- The “polder” approach (building controlled environment, behind levees) completely changed the way of living of farmers
- Bank erosion (the major problem during the floods) was considered only from technical point of view, not about how people can cope with it
- Nothing was done to improve the capacity of the locals (their local knowledge) to manage the rivers (“bandalling” for maintaining navigation channels and planting Catkin grass to control bank erosion)

Institutional Issues

- Bangladesh inherited from UK a (too heavy and bureaucratic) administrative structures
- World Bank imposed rationalization, which was not implemented rationally (cutting personal for basic functions, such as data collection, while keeping the top)
- Capacity building did not succeed because institutional setting was not adapted to host the new services (e.g., in the field of river studies, sediment transport and river morphology)

Outcome of the Project

- Project was a tremendous step forward in the understanding of the system, though not enough was done to have a sustainable strategy for basic data collection
- Expatriate experts learned a lot from the project, much more than the local experts

Outcome of the Project

- During implementation:
  - The 1993 Mississippi floods changed views about flooding (need for “managing” the rivers instead of “taming” them)
  - People’s participation became a hot issue (role of NGO’s) but it was not achieved properly
- The FAP benefited some (…) so that several donors did not support further the projects (FAP implementation)

The Var river

- A case study
  - Dramatic inundation in 1994 with huge damages revealed the bad state of the lower Var river
  - River environment had been changed by:
    - Land reclamation since 1840
    - Bed material extraction since 1945
  - Riverbed degradation had lowered groundwater table, affected agriculture
  - Weirs (or sills) had been established in 70^{ies} to raise water table (unsuccessful)

The Var river

- Weirs were designed to demonstrate the new low-head hydropower schemes (“bulb” turbines)
- Upper weir halted transit of sediment and produced further degradation of riverbed downstream last weir
- In 1992, the Ministry of Infrastructure launched a study to construct a highway partly encroaching on the riverbed
- 1994 flood caused destruction of first two weirs

The Var river

- Ministry wanted to reconstruct the weirs
- Local associations for the defence of the Var river opposed the plans of the highway and of the reconstruction of the weirs
- Legal battles going on since then, French experts not willing to assist locals because of intimidation by the Ministry
- Many battles won, however not yet the war …
- Story continues

Political Issues

- At national level
  - Poor interest for what happens in Nice
  - Want now to transfer responsibilities to local level because of the many problems
- At local level
  - Strong motivation of the indigenous people (farmers), though they have no illusion about their decreasing role
  - Some local authorities opportunistic and support the projects of the Ministry (some also threatened of retaliation by the Ministry …)

Social (& Socio-economic) Issues

- Local (indigenous) knowledge and traditions about managing the river is ignored by Ministry (and its consultants)
- Locals have very mature stands, defending the river (they inherited from their fathers and want to hand it over to their children in a good state)
- and they accept the inevitable, progressive disappearance of farming replaced by industry and tourism

Institutional Issues

- The French Water Law is considered as one of the best in the World, but not properly applied by the authorities
- The Schéma Général d'Aménagement des Eaux - SAGE ("General Water Management Frame") is a goo

Outcome of the Project

- Floods

Some questions

- How to handle social aspects of WRM?
- Can we predict social impacts of WRM and WRE?
- How can we solve conflicts among users, especially in crisis situations?
- Is long-term planning possible or desirable?
- How can donors or funding agencies assist in resolving or handling social, political and institutional aspects?

Thank you for your active participation

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