A DEVELOPER'S PERSPECTIVE ON SUSTAINABLE HYDROPOWER DESIGN AND OPERATION

Stephen Sparkes

Vice President, International Power

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The Overall Goal

- Ensure return on investment within legal requirements and in compliance with social and environmental standards
- Focus on costs and management of risks
- Focus on compliance and reputational risks

Design: Hydrology and Water Quality

WATER = ENERGY = REVENUE

- Quality hydrological data over time to ensure production
- Multiple or competitive water use in the basin
- Stable Water Quality standards
- Climate change analysis – potential impacts on inflows and extreme weather conditions (design criteria)

Design: Geology

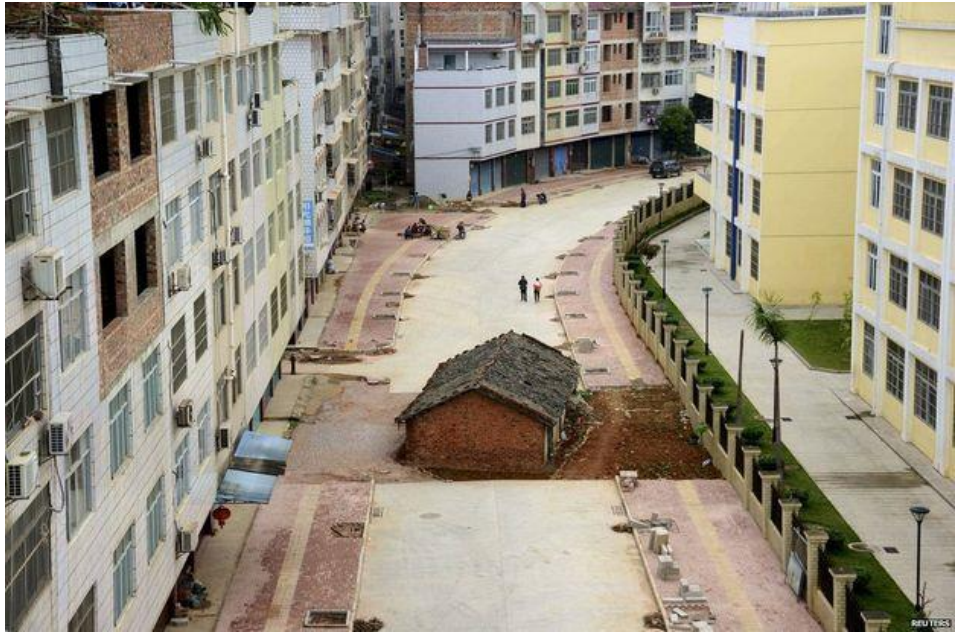
- Geological studies conclusive
- Earthquake prone areas: design of dam structure and features
- Challenges for tunnelling or use of TBM
- Risk of leakage – contingency for construction and loss of production for operation

Design and Operation: Fisheries

- Ample baseline data for the identification of impacts
- Viable mitigation measures that address fisheries
  - Monitoring indicators
  - Fish passages/ladders
  - Hatcheries or breeding programs
  - Introduction of new breeds
  - Alternative sources of protein
  - Biodiversity offset for aquatic

Design: Viable Resettlement Options

- Most challenging and costly part of social planning and mitigation
- Need enough good quality land or viable livelihood options
- Need cooperation from local people and government
- Need to be able to tackle opposition and criticism



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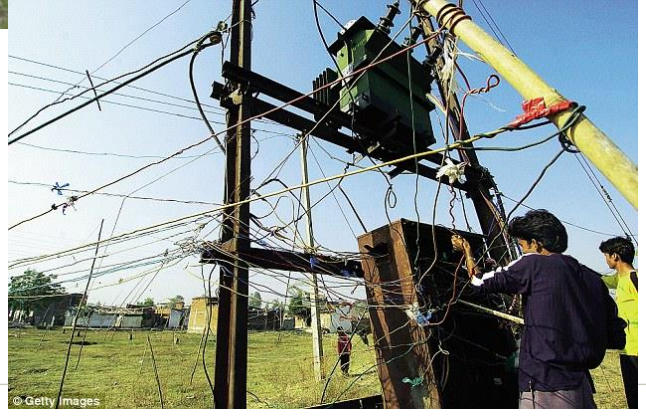
Design and Operation: Catchment Management

- Identification of measures to protect or manage catchment area
- Link between erosion or destruction of catchment and impact on operations?
- Implementation plans in accordance with environmental standards (combined with off-set)
- Limit encroachment and potential competition for water use

Design and Operation: Structures and Infrastructure



- Routes for roads and transmission lines need to be secure and safe – protection against theft and damage
- Ownership of all key land plots as part of the concession or licence agreement
- Retaining control of access to key structures and maintain them
- Avoid third-party ownership of access roads and other infrastructure

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Management of Expectations from Stakeholders

- Building long-term relationships with important stakeholders
  - Local communities
  - Local government organizations
  - National government entities
- Managing criticism from opposition groups
  - Communication Strategy
  - “Reasonable” level of transparency

Operation: E&S Closure and Running Costs

- Plan to wind down and handover E&S programs to government and local organizations
  - Ensure land ownership, livelihoods and institutional capacity
- Identification of essential support for the remaining concession period
- Optimize environmental monitoring programs to suit operational needs

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