



Foro Internacional

# GESTIÓN DEL RIESGO EN CENTRALES HIDROELÉCTRICAS

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# Managing Social and Environmental Risks for Hydropower Projects

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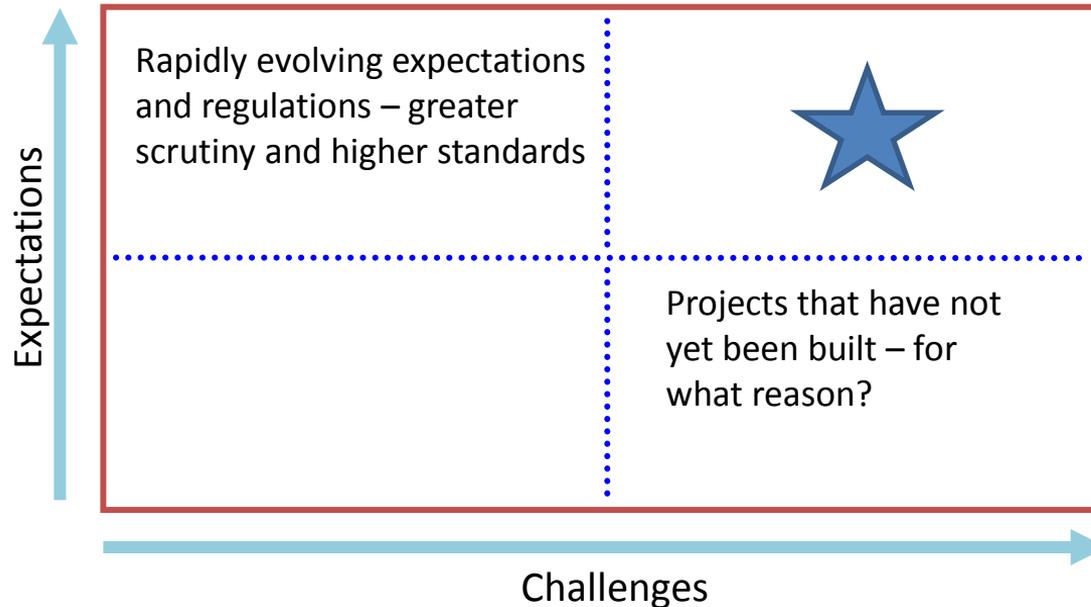
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# Overview of Presentation

1. Changing Risks and Approaches to Risk
  2. Overview of E&S Risks
3. Examples from Projects in South America and other parts of the world

# Increasing Challenges and Expectations



# Overall Risks for E&S Management

- Links to Construction Schedule
  - **Cannot delay construction**
  - **Cannot delay impoundment**
  - **Cannot delay production/operation**
- Avoid any risk of serious delay, claims and loss of revenue
- Need to make sure that E&S is properly planned and integrated into construction/operation plans
- Comply with local laws and regulations and in accordance with international standards (IFC/WB Performance Standards/Guidelines)

# General Project Risks

- Lack of understanding of E&S issues by owners and project management: need to go over fundamental issues repeatedly
- Unclear procedures and formats
- Unclear interfaces with technical planners and contractors (information sharing)
- Undefined budget and lack of delegation to E&S Manager for finance and decision-making



# Social Risks (1) – Project Lands

- Delay in compensation and handover of land to contractor (claims)
- Impacted communities not supporting project
  - Protests and resistance
  - Lack of cooperation from local authorities
- Population influx into construction areas and camps
  - Health and sanitation issues (water)
  - Security and enforcement
  - Conflict with local communities
  - Threat to natural resources



# Social Risks (2) - Resettlement

- Extent and scope of resettlement planning and implementation challenging: creating new societies
- Host communities acceptance of newcomers – conflict over resources
- Uncooperativeness regarding relocation
  - Alternative locations or insistence on cash
- Attachment to original territories
  - Psychological stress (indigenous people)
- Health issues (diet and diseases)



# Social Risks (3) - Livelihoods

- Competition for natural resources and land - lack of enforcement and inequality
- Ensuring adequate new lands for livelihood restoration – shortages and poor quality
- Changes in technology and resource base – Trial and error approach (be prepared for failure)
- Time line for restoration
  - Livelihoods require time and resources
  - Long-term strategy to ensure results
  - Long-term commitments needed (budget)





# Environmental Risks (1) - Design

- Power Purchase Agreement Conditions
  - Peaking power and river level changes
  - River bank erosion and sedimentation
- Gates and flushing issues
  - Water quality issues and sediment control
- Fixed intake structures
  - Varying water quality and downstream impacts
- Sourcing of materials and corridors
  - Access to quarries
  - Impacts from road and transmission line corridors



# Environmental Risks (2) - Grey

- Contractor compliance with environmental regulations and procedures – monitoring standards
  - Pollution from waste or hazardous waste
  - Lack of sediment control measures
- Managing contractor camps
  - Management of waste water (sewage)
  - Enforcement of social control measures
- Impact on nearby communities
  - Competition for water and other resources
  - Traffic safety, dust and noise pollution



# Environmental Risks (3) - Green

- Changes in water quality and water flow
  - Impacts on aquatic habitats
  - Loss of fish stocks and source of protein for population
- Loss of forests and terrestrial habitats
  - Potential impacts on red-listed species or loss of areas of high biodiversity requiring offset
  - Identification of reforestation areas
  - Conservation management (watershed)
- Biomass clearance and debris removal
  - Water quality downstream and in reservoir (GHG)
  - Disposing of debris



# Coping with E&S Risks: New Paradigms

- Good planning and analysis (baseline and mitigation options)
- Clear policies and procedures (defining interfaces construction schedule)
- Early Project Management Team (overlap with planning process)
- Ample time and resources for consultations with stakeholders (2-3 years)
- “Developmental approach” (Benefit-sharing) rather than a “compensation approach” in order to establish trust and cooperation
- Set-up environmental monitoring with contractors
- Think in terms of preventative measures rather than reactive mitigation – spending more money up front to avoid problems

# Influencing Design – Trade-offs

## Example 1: Nam Theun 2 in Laos

- Downstream channel, regulating pond and aerating weir
- Additional costs but reduced environmental impacts – erosion, sediment flow and slumping

## Example 2: Osorno HPP in Chile

- Reassessing original dam design taking into consideration impacts on ritual site
- Potential loss of production and revenue but boarder stakeholder acceptance



# Compensation and Resettlement Approaches

## Example 3: Kargi HPP in Turkey

- Expropriation payments and court cases
- Additional programs for livelihood restoration
- Challenge of “proving” benefits



## Example 4: Developmental Approach

- Understanding regional trends and developments
- Mitigation aimed at solving more than immediate needs and impacts (sustainability)
- Long-term commitment to targets and support as part of O&M



# Public Acceptance – Benefit-Sharing

## Example 4: Social License to Operate in Peru

- Lack of trust and history of conflict
- Limited government presence and policy
- CSR programs to promote development



## Example 5: Benefit-Sharing in Norway through Taxation

- “Everybody gets something” approach/model
- Taxation and sharing benefits institutionalized (38% to local, regional and national taxes)
- Facilitates investment and cooperation





# ¡Muchas gracias!

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