Guidelines for the Multi-Purpose Evaluation of Hydropower Projects

Improving Decision-Making for Mekong Hydropower
MRC’s Initiative for Sustainable Hydropower

Sustainable Hydropower Practice Forum
Bangkok: 25-26 October 2016
Dr. Bruce Aylward
Structure

• Overview of the Guidelines
• Hydropower Planning Support Tool
• Role in the Planning Cycle
• Contribution to Sustainable Hydropower
• Applications of the Guidelines
 Guidelines Objective

- Address the need to more explicitly integrate social and environmental costs and benefits in hydropower development planning.
- Evaluate hydropower projects from a multi-purpose perspective to increase overall economic benefits and decrease adverse effects on other water uses.
ISH02/Guidelines Products

MAIN REPORT: Guidelines Process

ANNEX 1:
Practice Guide on Economic Evaluation and Valuation of Hydropower and Multi-Purpose Dams

ANNEX 2:
Practice Guide on Consultation, and Social and Environmental Indicators

ANNEX 3:
User Manual for the Hydropower Planning Support Tool

Sustainable Hydropower Planning Support Tool
Guidelines Data Flow

- Basin Data
  - Maps
  - Project Locations

- Project Data
  - Engineering
  - Economic
  - Social
  - Environmental

- Other Information
  - Economic Data
  - Ecological Studies
  - Economic Valuation
  - ISH01 Data

- Social and Environmental Criteria
  - Stakeholder Weightings

- Economic Analysis

- Financial Analysis

- Multi-Criteria Analysis

- Planning Decisions

AMP Insights
HPST Structure

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<th>Tab Group</th>
<th>Tab Sub Group</th>
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<td>Summary</td>
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<td>Multi-Criteria Analysis</td>
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Data Workbook
- Raw Data
- Data Testing
- Cleaned Project Data

Other Information
- Economic Data
- Ecological Studies
- Economic Valuation
- ISH01 Data

HPST Overview
Basin
Projects
Parameters

Environmental
Social
Stakeholder Inputs
Criteria
Weights

Direct Costs & Benefits
Local Costs
Downstream Costs
Carbon Benefits

Financial Projections
Financial Value

Financial and Economic

Results: MCA

Basin Workbook

Non-Monetary

Monetary
## Impact Framework and HPST Monetized Values

<table>
<thead>
<tr>
<th>Framework</th>
<th>Location</th>
<th>HPST Economic Valuation</th>
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<tr>
<td><strong>Direct</strong></td>
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Economic Results

$2014$ millions USD

- Project 1
- Project 2
- Project 3
- Project 4
- Project 5

- Benefits After Costs
- Downstream Costs
- Livelihood Costs
- Property Costs
- Capital Costs
Indicator Results

Scale: Lower values are less risky

Project 1

Project 2

Project 3

Project 4

Project 5
Multi-Criteria Results

Scale: For BCRs, more positive is better
For Env & Soc, less negative is better

- Project 1
  - Econ BCR: 1.50
  - Env & Soc Score: -1.00
  - Weighted BCR: -0.50

- Project 2
  - Econ BCR: 1.00
  - Env & Soc Score: -0.50
  - Weighted BCR: -0.25

- Project 3
  - Econ BCR: 1.00
  - Env & Soc Score: -0.50
  - Weighted BCR: 0.75

- Project 4
  - Econ BCR: 1.00
  - Env & Soc Score: -0.50
  - Weighted BCR: 0.50

- Project 5
  - Econ BCR: 0.50
  - Env & Soc Score: -0.25
  - Weighted BCR: 0.25
Planning Process
Portfolio Planning Process

1. Feasible Project Portfolio
2. Economics
3. Environment & Social Indicators
4. Weighted Evaluation
5. Project Modifications, if needed
TEAM ESTABLISHMENT AND PROBLEM DEFINITION
Step 1: Appoint the Portfolio Planning Facilitator and Planning Team
Step 2: Identify the Scope of the Planning Effort
Step 3: Identify and Recruit Stakeholder Group
Step 4: Inception Stakeholder Workshop to Finalize the Scope

DATA COLLECTION AND ANALYSIS
Step 5: Joint Fact Finding
Step 6a: Economic Valuation and Evaluation of the Costs and Benefits
Step 6b: Assessment of non-monetary social and environmental Indicators
Step 6c: Adapt/validate decision support tool

STAKEHOLDER CONSULTATION AND MULTI CRITERIA ANALYSIS
Step 7: Planning Workshop

REPORTING AND DECISION MAKING
Step 8: Reporting
Step 9: Decision-Making

PROCESS REVIEW AND LESSONS LEARNED
Step 10: Evaluate the process, methods and tools and modify the Guidelines as required.
Contributions to Sustainable Hydropower
Key Features

- Practical and replicable method
- Valuation of the assessed socio-economic and environmental costs and benefits of hydropower
- Methods for these valuations to be internalized in the economic or other analysis and integrated with the strategic power planning approaches of the member countries
- Consultative and participatory process led by the responsible national authorities
Advantages

• Organizes available information in a practical form for basin planning purposes
• Develops a model that uses the information to value and consistently compare positive and negative economic impacts across projects
• Identifies and includes key non-monetized environmental and social indicators in a multi-criteria analysis
• Provides a process for on-the-ground stakeholder consultation and involvement
Benefits

• Take advantage of early design information and stakeholder inputs
• Provide early and transparent estimates of project worth and identify key risks
• Avoids over-reliance on financial measures of project worth
• Weed out problematic projects at an early stage
• Avoids over-investment in poor projects and developer lock-in
Scope for Guidelines Application

- Sub-basin HPP evaluation, e.g. Srepok
- Mainstream HPP evaluation
- Country HPP evaluation
- Evaluation of a suite of power alternatives, e.g. for a single site or a single tributary