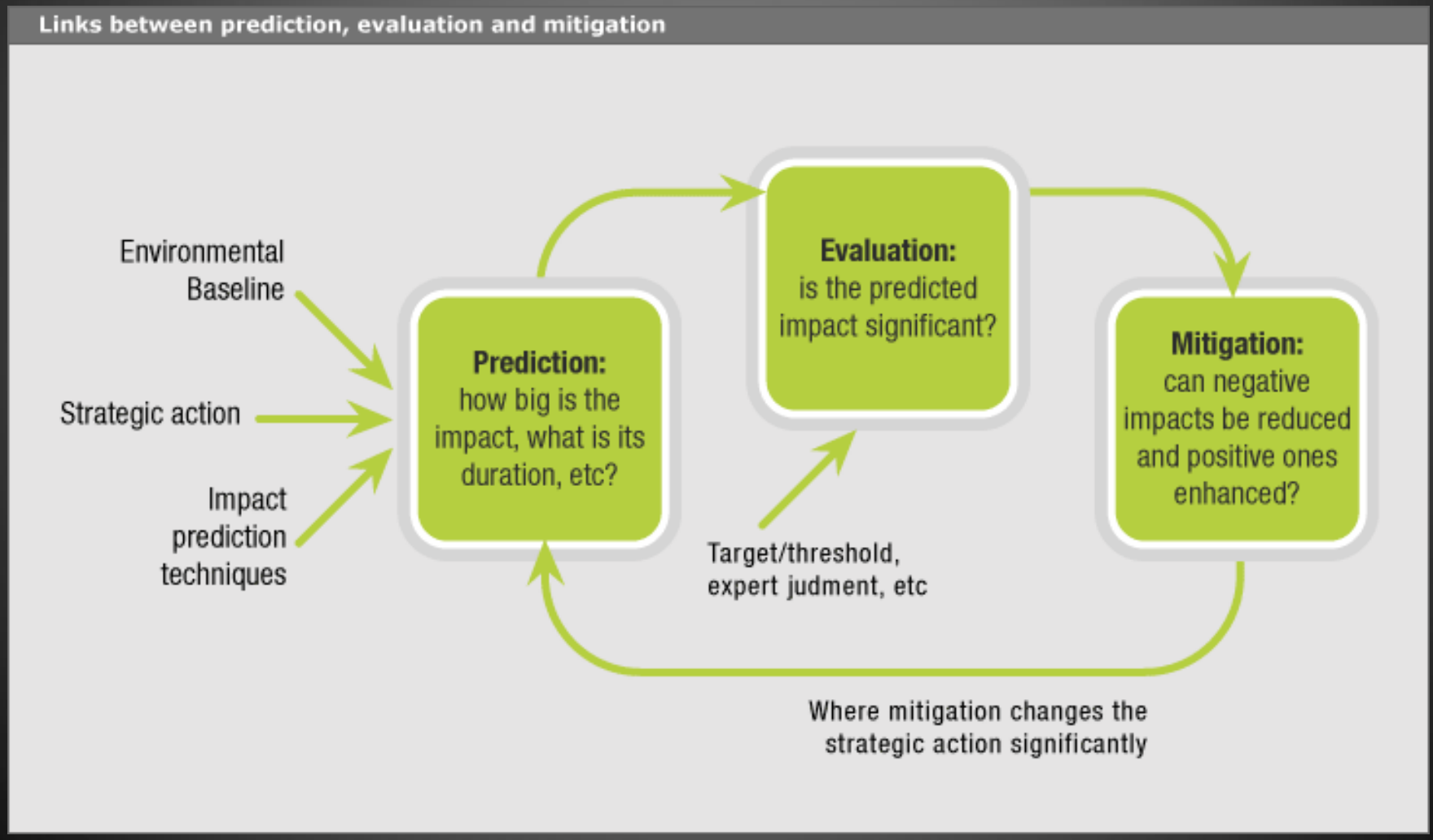
Strategic Approaches to the Assessment of the Impacts of Development on People and the Environment

Prediction, evaluation, mitigation – the basics



List of methods and tools

Environmental systems analysis
- Global land use accounting
- Total resource use accounting
- Ecological footprint
- Material flow analysis
- Life cycle analysis
- Input output analysis

External cost estimation
- Cost benefit analysis
- Cost effectiveness analysis
- Legislative cost estimation

Modelling
- Biophysical model
- Socioeconomic model
- Integrated model
- Land use model

Future studies/scenario analysis
- Predictive future study
- Explorative future study
- Visionary future study

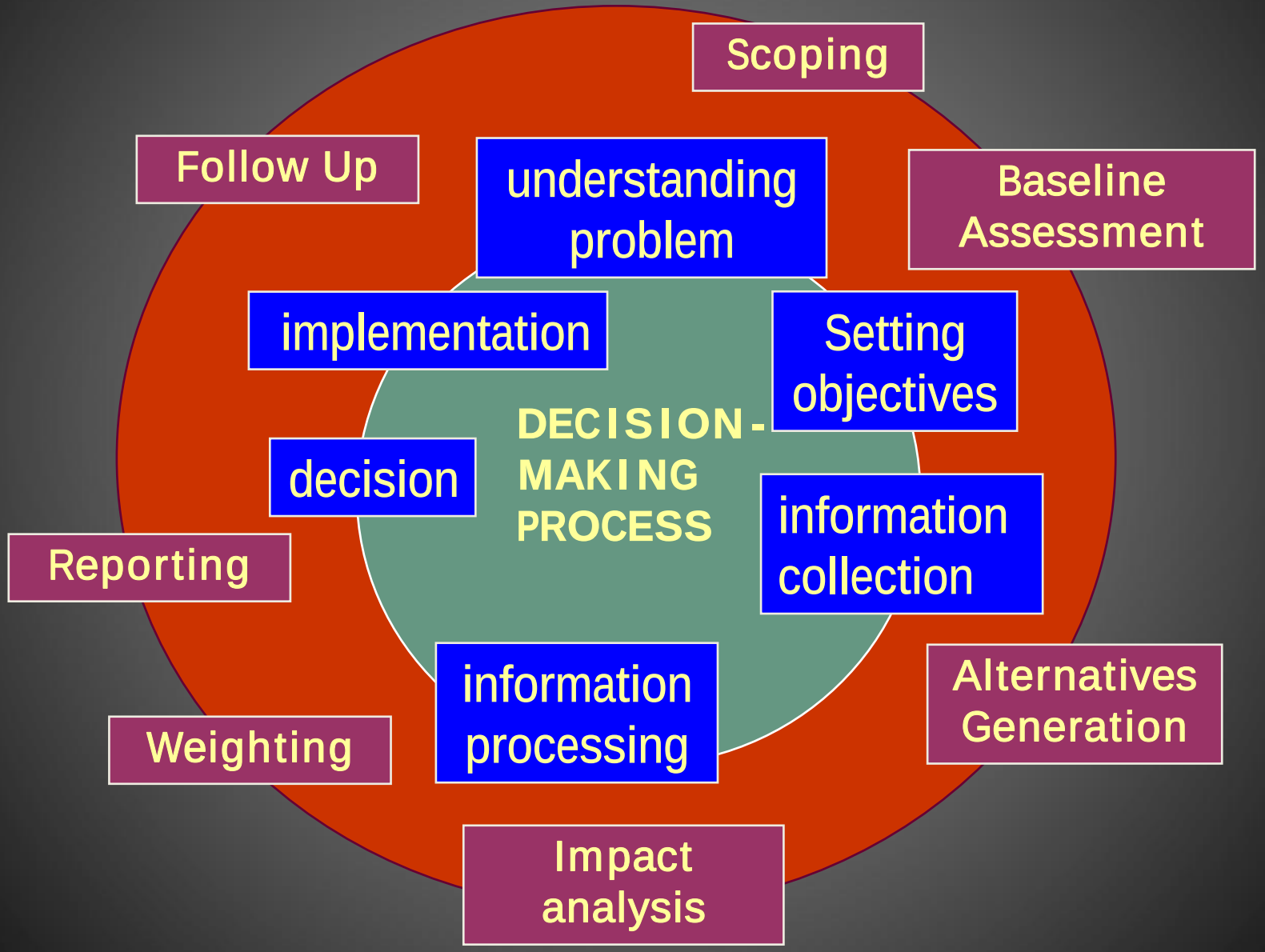
Multi-criteria analysis
- Value focused thinking
- Weighted summation
- Multiple-attribute value theory

Strategic tools
- Problem tree
- Causal model
- Impact matrix
- Integrated sustainability assessment (ISA)
- Sustainability impact assessment (SIA)
- Strategic environmental assessment (SEA)
- Indicators and mapping for vulnerability assessment
- Indicators (general)

Participatory approach
- Focus group
- Consensus conference

Regional approach
- Biosphere reserve
- Indicators of sustainable community
- Integrated Model for Residential and Employment Location (IMREL, RTK)
- rAps
- Transport/Residence Integrated Model (T/RIM)
- Spatial Residential and Employment Automated Distribution (SPREAD)
- Integrated planning model

SEA PROCESS


Scoping
Follow Up
understanding problem
Baseline Assessment
implementation
Setting objectives
DECISION-MAKING PROCESS
decision
information collection
Reporting
information processing
Alternatives Generation
Weighting
Impact analysis

Contrasting models of SEA

	EIA-based SEA model (impact-centred)	**Policy-based SEA model (decision-centred)**
Intended role for the SEA	As regulatory safeguard and technical report to inform decisions about mitigation and monitoring	As strategic decision and planning support
Timing of the SEA	Carried out as one-shot activity as evaluation of alternatives	Supporting discussions throughout process about problems, goals, alternatives and impacts
Regulatory support	Stipulated in most national and international law	Lacking regulatory support other than best practice in some governments
Issue coverage	Focus on environmental impacts according to the regulatory guidelines	A broader scope including indirect and development effects according to decision-maker's priorities

SEA is Policy Analysis or Strategic Planning for Sustainability

- Long-term continuity
- Balance between nature, welfare, social, possibly other aspects
- Complex trade-offs under uncertainty
- Complex decision making processes
- Preferences subject to change, depend on point of view

STRATEGIC ENVIRONMENTAL ASSESSMENT OF THE HYDROPOWER MASTER PLAN IN THE CONTEXT OF THE PDP VI

Ministry of Industry and Trade & Ministry of Natural Resources and the Environment

In partnership with the Stockholm Environment Institute

Supported by the Asian Development Bank

Power Development Plan VI and Hydropower Development in Viet Nam

- Viet Nam uses a 5 year planning cycle, including for the power sector
- The Power Development Plan predicts future demand for electricity and identifies the best generation sources to meet this demand
- The selection of generation options is based on a “least cost” model, taking into account economic, social and environmental costs
- The overall purpose is to ensure that Viet Nam has the power to meet rapid growth of demand in an expanding economy and changing society

The Goal

To maximize the potential contribution of hydropower to national development through a strategic planning approach that balances economic development, social equity and environmental

SEA as a Tool for Strategic Planning

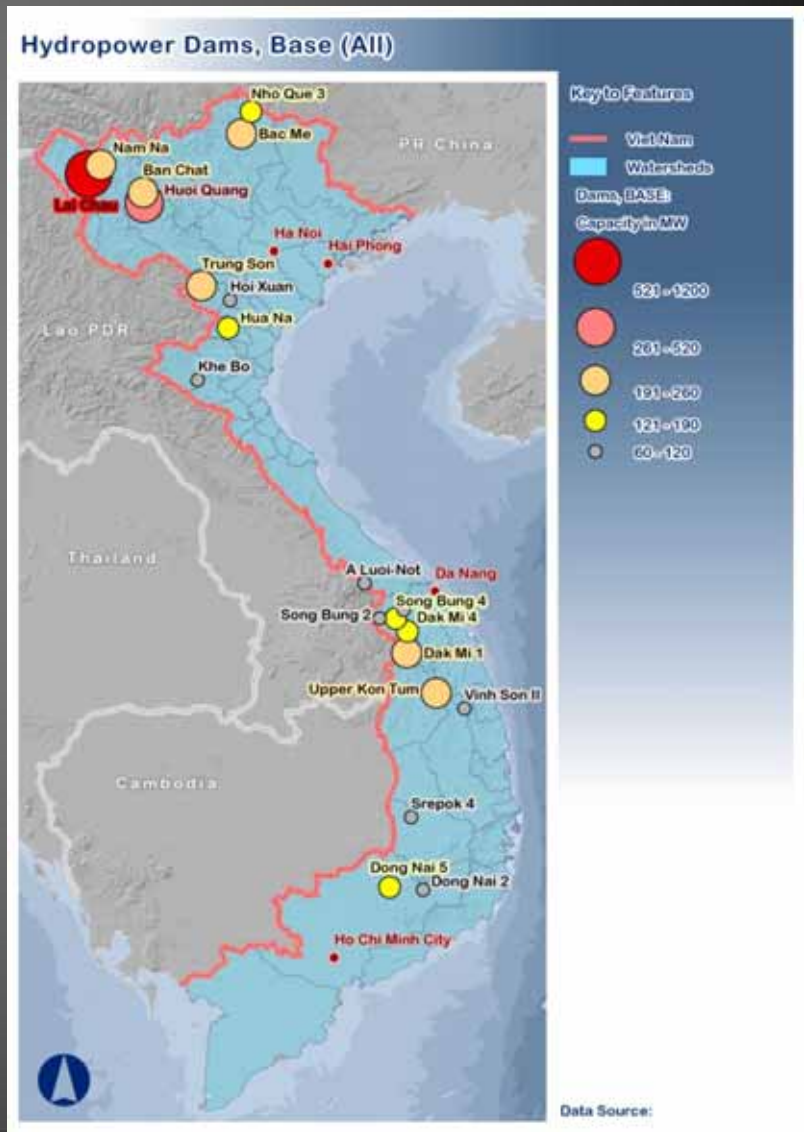
- SEA is a process of evidence-based analysis of social and environmental issues within a planning context
- A means to consensus-building, including recognising trade-offs and linking sector goals to the overall national development goals of the 2006 – 2010 Socio-Economic Development Plan
- A pilot project to develop the capacity to integrate SEA into the strategic planning for the power generation sector

Scoping Exercise: The Top 5 Strategic Issues

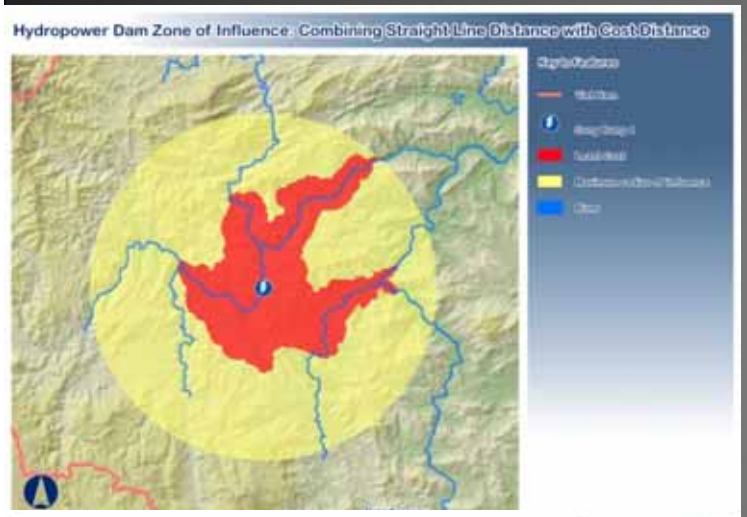
- Hydropower's contribution to national development
- Sustainable water resources management
- Mitigating impacts on project affected people
- Maintaining ecosystems integrity in hydropower development
- The hydropower planning system

Five Scenarios of Future Power Generation Mixes

- Base Case: all hydropower planned up to 2025 goes ahead
- 3 Scenarios where hydropower replaced with thermal power
- Scenario: all hydro replaced with thermal power
- Zero case: no hydro & no thermal
- Analysed economic, social and environmental costs for each of the scenarios



Steps in Assessing Impacts
The Overall Approach



Three Components:

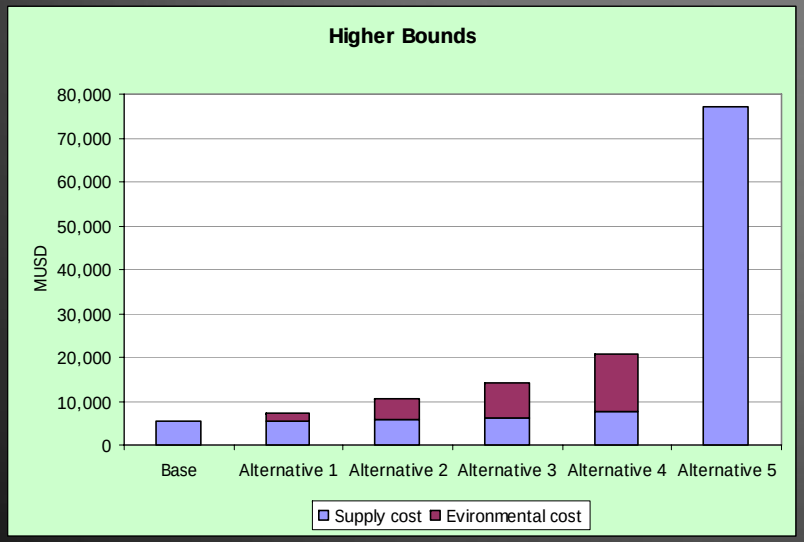
1.Reservoir Area: land lost and people displaced

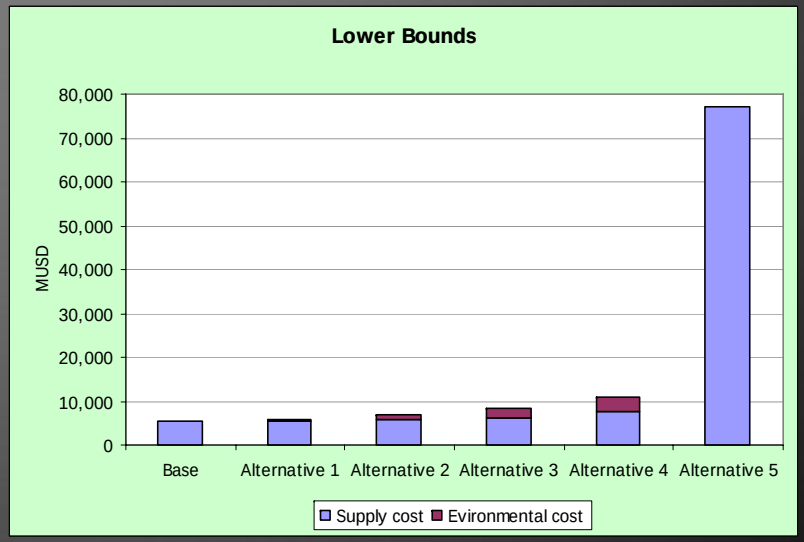
2.Zone of Influence: social and environmental impacts in the area of the dam and resettlement area

3.Wider Impacts: impacts beyond the zone of influence: air pollution & changes to hydrology in key river basins

Total Cost of Supply and Environmental Costs

Scenario	Present Value of Supply MUSD	Present Value of Environmental Cost Higher Bound MUSD	Present Value of Environmental Cost Lower Bound MUSD	Total Present Value Higher Bound MUSD	Difference Total Present Value Higher Bound MUSD	Total Present Value Lower Bound MUSD	Difference Total Present Value Lower Bound MUSD
Base	5,435.65	19.47	5.37	5,455.12	0	5,441.02	0
Alternative 1	5,445.48	1,882.51	477.32	7,327.98	1,872.86	5,922.80	481.78
Alternative 2	5,729.46	4,785.67	1,212.80	10,515.13	5,060.01	6,942.26	1,501.24
Alternative 3	6,268.42	7,994.41	2,025.66	14,262.83	8,807.71	8,294.08	2,853.06
Alternative 4	7,741.38	12,810.12	3,245.75	20,551.49	15,096.37	10,987.13	5,546.11
Alternative 5	76,937.87	0	0	76,937.87	71.482.75	76,937.87	71,496.85





Changes to Storage Capacity, Dry Seasons Flows and Maximum Potential Benefits by Scenario

Scenario	Addition to Storage Capacity (Mm^3)	Dry Season Supply Change (m^3/s)	Flood Control Capacity (Mm^3)	Additional Irrigated Area (Ha)	Additional Crop Yield (rice ton/year)	Economic Value of Crop Yield (000 US$)
Scenario 1	7,644.4	495	734	26,990	156,542	92,047
Scenario 2	6139.9	365	403	19,290	111,882	65,786
Scenario 3	4553.2	231	102	11,090	64,322	37,821
Scenario 4	1470.6	95	0	4,490	26,042	15,312
Scenario 5	0	0	0	0	0	0

Assessment of Hydropower Impacts in the Zone of Influence

- Calculate the resource values of each land use: “stock” value and/or “income” value
- Estimate factors causing change: population changes, improved access, land loss, ecosystems fragmentation
- Define % of resource value lost/gained for each land use category
- Define qualitative cultural values
- Assess cost of full mitigation and development package for local communities
- Assess impact of relocation site, based on number of households relocated
- Assess impact on biodiversity and the integrity of forest and aquatic ecosystems (key vulnerable areas)

Results and Recommendations

- Overall results still being calculated, but initial findings indicate that a full package of social and environmental mitigation costs would not compromise the overall economic viability of the hydropower schemes in the analysis
- Environmental costs of alternatives (thermal) are so high that the most favourable scenario is the full hydropower development
- SEA provides a means for developing a balanced analysis and constructing a consensus amongst stakeholders based on the best evidence available

Results and Recommendations 2

- Recommendations to improve the effectiveness and sustainability of hydropower under discussion, including:
  1. A full social development package for displaced people
  2. The scope for improved multi-purpose reservoir management
  3. More effective identification of risks to ecosystems integrity at the strategic planning level within whole river basins
  4. More local participation in hydropower planning and better links to local development planning and programmes
  5. The integration of SEA into the power development planning cycle, including necessary changes to rules and regulations
  6. Capacity building to enhance SEA capabilities for the sector and for other sectors in Viet Nam

Thanks for Listening