



*Mainstreaming Biodiversity in Infrastructure:
Roads, Hydropower and other Development Sectors*

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October 2008



Biodiversity Challenge

- **Bank focus on development and poverty alleviation.**
- **How to integrate biodiversity with development and infrastructure**
- **Safeguards – OPs Natural Habitats, Involuntary Resettlement and Indigenous Peoples**
- **Beyond mitigation to conservation gains (win-win).**



Examples of Adverse Impacts of Road Works on Biodiversity



Induced Impacts:

- Settlement of remote areas
- Deforestation or other land clearing
- Excessive wood cutting
- Hunting of vulnerable species

Direct Impacts:

- Direct loss of natural habitats (ROW and complementary works)
- Fragmentation of natural habitats
- Altered drainage patterns
- Pollution or sedimentation of aquatic ecosystems
- Disturbance from construction workers
- Social impacts



Mitigating Induced Impacts



- ❖ Site choice to avoid important natural habitats and ecological flows.
- ❖ Focus on more populated rural areas
- ❖ Establish/strengthen protected areas to reduce or compensate adverse impacts.
- ❖ Demarcate and title indigenous and other traditional community lands.



Mitigating Direct Impacts



- ❖ Alignment of roads, (rail, pipelines, canals, powerlines).
- ❖ Construction & maintenance – drainage, waste disposal, supervision of worker behaviour (e.g no hunting)
- ❖ Compensate adverse impacts through livelihood and community development
- ❖ Increased enforcement & monitoring



Hydropower: Nam Theun 2



- *Lao PDR* – 33% population below poverty line; 70% below \$2 per day
- Landlocked, mountainous, sparsely populated (5.5 million)
- Limited industry and exports – 30% electricity
- Extensive water resources





NT2 - Learning from the Past



- ❖ Comprehensive approach
- ❖ Recognize downstream impacts
- ❖ Consultation as a *continuous* process to benefit communities
- ❖ Integrate environment and social aspects into overall costs and implementation
- ❖ Supervision & oversight –intl. panel
- ❖ Sustainability





Offsetting Planned Losses

❖ **Environment:**

Conservation of 4000 sq. km. (nine times the size of the reservoir)

❖ **Social:**

Restricted access to natural resources as result of conservation plans (5800 people)

An offset is only an offset if it works –balance conservation and development aspirations



SEMFOFOP Activities



- Specialized agency to manage the program
- Strengthen patrolling, enforcement & monitoring, forest management; reduce cross-border threats
- Livelihood development - land and resource-use rights, improved NRM, better access to infrastructure & services;
- Trust fund being set up for revenues
- Secure financing of US\$ 31.5 million for conservation activities for 30 years





Flood regulation - Argentina

NE Argentina - 3 major rivers, HEP in upper reaches
Flood defense strategies & preparedness

- ❖ Regional environmental assessment –alternatives
- ❖ Early flood warning systems
- ❖ Flood risks assessed prior to construction
- ❖ Civil works – bridges, drainage canals , embankments
- ❖ Environmental guidelines for flood-prone areas
- ❖ Protection of natural wetlands & forests as part of flood control strategy





Climate Change – an Opportunity



- Problems: water stress, natural hazards**
- Irrigation, energy needs, coastal defenses and flood control.



Ecosystem-based solutions for adaptation:

- Protecting forests and wetlands for water storage and recharge, flood defence
- Mangroves versus sea walls
- Controlling invasive species to reduce need for additional infrastructure (WfW)



Mix and match

