Vishnugad Pipalkoti Hydropower Project
Tehri Hydro Development Corporation
Uttarakhand, India

World Bank Water Week
February 17, 2009

Pyush Dogra (Environmental Specialists) & Daryl Fields (Senior Water Resources Specialist)
in partnership with
Mr. Maurya (Project Manager, VPHEP) & Mr. Vishnoi (Deputy General Manager (Civil & Hydro-Mechanical Design) THDC)
Presentation Outline

- WHY Vishnugad Pipalkoti?
- Building a project PARTNERSHIP
- An interim ASSESSMENT
**Project Description:**

**Schematic of Vishnugad Pipalkoti HEP**

**TECHNICAL STATS**
- 444 MW
- Diversion (run-of-river)
- 65 concrete gravity dam
- Underground powerhouse
- Desilting chambers

**WATER STATS**
- 21.5 ha submergence
- Catchment area: 4672 km²
- Tributary of the Ganges River
- Within cascade development

**FINANCING STATS**
- US $500m project cost
- IBRD $400 million proposed
- Equity: GoI + GoUk

To DEVPRAYAG (60 km)

CONFLUENCE WITH BAGIRATHI RIVER AND START OF GANGES RIVER
Project Description:
Environmental and Social Impacts

- Land acquisition: 103 ha (16% private; 10% community; 74% government)
- 31 displaced families
- 19 affected villages

- Reduced river flows: 27 km
  - Environmental flow: 3 cumecs at dam (15% lean season flow)
- 4 new approach roads
- No endangered/threatened/rare species in project area
  - Nanda Devi Biosphere Reserve 16 km upstream of dam
WHY Vishnugad Pipalkoti?

Strategic Context

**THDC Perspective**
- Energy security: Electricity shortages; High growth
- Part of cascade development to capture significant hydro resource
- Major state revenue
- Govt interest in WBG involvement to build institutions according to international practices
- THDC completed Tehri Hydro Project, but with social and environmental controversy

**WBG Perspective**
- Clear development rationale for engagement
- India hydropower position paper set strategy for scaling up (focus on partnerships, capacity building)
- Complement to ongoing power sector and small hydro lending
- Follow up to Rampur project
- Consistency with Bank-wide strategies
Building a PARTNERSHIP: At the Beginning

THDC Perspective:
- Engineering-focused company with significant technical skills
- Financially sound
- Tehri project just started operations (at 100% capacity), with complementary projects underway
- Indian environmental clearance awarded to VPHEP
- Technical and project management team on-site at Pipalkoti

WBG Perspective:
- First-time WBG borrower
- Gaps in environment and social capacity within THDC
- Success but legacy with Tehri hydro project
- New state government; engaged central government
- WBG re-engagement in hydropower (Bank-wide) still new and considered risky
- Success at Rampur
# Building a PARTNERSHIP: The World Bank’s Role

<table>
<thead>
<tr>
<th>THDC Perspective:</th>
<th>WBG perspective:</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Practical experience on international projects</td>
<td>- Connections among central, state and corporate policies</td>
</tr>
<tr>
<td>- Conduct of studies early in projet development, providing insight into complexities</td>
<td>- International good practice</td>
</tr>
<tr>
<td>- A clear and more aggressive awareness of environmental and social issues</td>
<td>- International experts and funds for studies and capacity building</td>
</tr>
<tr>
<td>- More focused attention on critical issues, with more in-depth analysis of risks</td>
<td>- Full service support, from technical to procurement to environment to social</td>
</tr>
<tr>
<td>- A broader, global vision</td>
<td>- Team emphasis on communication and commitment</td>
</tr>
<tr>
<td></td>
<td>- Developing champions within THDC</td>
</tr>
</tbody>
</table>
Building a PARTNERSHIP: Stumbling Blocks

**THDC Perspective:**
- Delay in understanding the work methodology of the WBG including:
  - coverage of issues
  - milestones for approval
  - formats for documentation
- Early tensions re: roles and authority

**WBG Perspective:**
- Early tensions re: role and authority
- Time invested to build trust and cooperation
- Differing practices regarding consultation and involvement of affected peoples
- Ongoing concerns with risk within WBG
An Interim ASSESSMENT:
Some Successes

Social Development

- Significantly enhanced presence on the ground (MSWs, NGO)
- Clear resettlement policies, in Hindi, shared throughout basin
- More effective project layout (e.g., relocation of surge shaft to avoid resettlement and land acquisition)
- Community investments in advance of construction

Environmental Management

- Managed flow study & river basin studies
- Engineering solutions: Check dams for environmental flow management
- Planning for Environmental Management System
- Strict provisions included in construction tender documents

Integration of engineering, environmental and social design for sustainability and risk management, at little or marginal incremental cost
An Interim ASSESSMENT: Some Successes

**Technical and Economic**
- Geological baseline study
- Risk matrix for civil and hydro-mechanical works
- Innovative contracting specifications to mitigate speculative and dispute-prone clauses

⇒ Accolades from Government of India; setting new standards of good practice nationally

“THDC has benefitted immensely with [the World Bank’s] constructive attitude shown towards the whole matter of project development… The contribution ..may be further elevated by increasing the frequency of missions to the THDC establishments” (THDC, February 2009)
An Interim ASSESSMENT: Ongoing Challenges

Technical and Economic

- Timeline for procurement, including WB approvals process
- Anxiety concerning final WB approval
- Choice of tunneling technique (tunnel boring machine vs. drill and blast)

Social Development

- Basin-wide concerns, esp. regarding house cracks from blasting and disruption of community streams
  - Settlement with one village not finalized
  - Implementation of national policy for benefits-sharing unclear

Environmental Management

- Challenge of developing and implementing a credible and enforced Environmental Management System
- Incorporating results of managed flow and cumulative impacts study
- India-wide capacity for environmental assessment lacking
- Lagging state policies
Lessons Learned

- **WHY Vishnugad Pipalkoti?**
  - Strong development rationale
  - Consistent with a clear, long term vision for WBG engagement in hydropower
  - Company with potential future projects

- **Building a project PARTNERSHIP**
  - The WBG’s most significant contributions are:
    - targeted resources (funds, international expertise)
    - personal and team commitment
    - proactive approach to risk management
  - Policies, behaviours and attitudes do change (both within THDC and the Bank)
    - but it takes trust and evidence of the business benefits
  - Frequent Bank missions to THDC establishments
    - provided opportunities for learning and understanding of WBG work methodology and
    - strengthened the WBG’s understanding of the pressures and capabilities of THDC
Lessons Learned

An interim ASSESSMENT

- Innovative solutions to environmental and social issues emerge from cross-sectoral exposure.
- Development benefits emerge from preparation as well as the infrastructure itself.
- People of THDC have been able to broaden their global vision, strengthening the organization in general and individuals in the long run.
- Partnership has led to a more effective project layout and effective work practices within THDC.
- Numerous challenges remain, esp. during construction.

It is and will continue to be an exciting ride!
Thank-you