Integrating Multiple Stakeholders in the Ecological Restoration of an Iron Ore Mine in Odisha, India

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Policy Context

Iron Ore Mining in India

• federal structure of government and environmental clearances for mining

• Regulatory compliance
Case Study: Ecological Restoration at SAIL Bolani Mines, Odisha, India

- SAIL has 12 sq. miles of Mine Leases for Iron and Manganese Ore in Bolani, Odisha, India
- 75 acre area near SAIL’s Active open-cast Iron ore D Area Mines earmarked for restoration

*Plantation Map of Experimental Site (Right) in India (Inset)*
Tatiba Village

• 985 people in 236 households (Census 2011)
• 82% Tribal: *Munda, Karva* & sub-tribes of *Birhor* community & Others: Hinduism & Christianity
• Livelihood strategies (vary across households):
  – Majority indirectly dependent on mining
Ecological Restoration Workflow

Site Surveys
- Degraded; lacking top soil
- Vegetated area heavily infested with aggressive invasive weeds
- Iron Oxide dust blow from OBDs

Site preparation
- Weed removal by cut-root-stock method (Babu et al 2009) employing local people
- Check dams to improve soil moisture

Plantation
- Developing Field Nursery with the help of local people
- Introduction of early successional species and 8 species of grasses

(Adapted from SER 2004)
Integrating Stakeholders

- Mining Company & Township
- Regulatory Agencies (MoEF)
- Local People
- Tribal community

Restoration Ecology
Ecosystem Services

conflicts & paradoxes

- CO₂ sequestration
  - Regulating Services
- Park
  - Cultural Services
- NTFP Garden
  - Provisioning Services
  - Cultural Services

Mining Company
Mining Township

State Regulatory Agencies

Tribal people

Restoration Ecology

Forest Ecosystem
- Supporting Services
  - Regulating Services

‘Native’ Ecosystem
- Supporting Services
  - Regulating Services
Tribals & The Restoration Project

- Key uses: fuel wood and fodder
- NTFP Garden choice dominant
- Variation among & within households
- Restore to native Tropical Deciduous Forest Ecosystem
- Dominant climax vegetation: *Sal* trees (*Shorea robusta*)
Conclusion

- Complex ecological and social settings of developmental projects in India pose a major challenge for conventional restoration approaches.
- Stakeholders can have divergent ecosystem service requirements, in space and across time.
- Divergence is made visible, and could be potentially offset, in a multidisciplinary setting (Kota & Shackleton 2014).
- Critical social, political and ethical challenges in Restoration when negotiating among different stakeholders with dynamic preferences.
References


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