Coastal Area Planning and Management Using Forests and Trees as Protection

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Coastal Protection in the Aftermath of the Indian Ocean Tsunami: what role for Forests and Trees

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Approach

Coastal Hazard Management Phases:

- Phase I: Assessment
- Phase II: Mitigation
- Phase III: Implementation

Phase I

Clarifying the Issues:

- Hazard Assessment
- Vulnerability Assessment
- Risk Characterization

Hazard Identification Approach

- Inventory of Existing Data on Coastal Hazards
- Discussions with local and national agencies and stakeholders (e.g. glass bottom boat owners, hotel operators)
- Site Visits/Observation
- Interdisciplinary Consultations

Vulnerability Assessment

Identify and characterize impacts from prior events

- Correlate effects with coastal geometry
- Correlate with eco-system features

Vulnerability Assessment (cont.)

- Correlate hazard with man-made societal features

During this task institutional factors such as enforcement of land use planning regulations are assessed

Risk Assessment

Correlate the hazard with the vulnerability

Probability and Consequences

Hikkaduwa, Sri Lanka Case Study

Hazard	Frequency	Consequence	Return
Cyclone	Moderate	High	1-15 years
Tsunami	Rare	High	>15 years
Landslide	Rare	Moderate	>15 years
Coastal Flooding	Frequent	Moderate	Annual
Riverine Flooding	Frequent	Moderate	Annual
Coastal Storms	Frequent	Moderate	Annual
Coastal Erosion	Frequent	Low	Annual

Outcome of Probability/Consequence Analysis:

Weighting of priorities to be used in establishing mitigation strategies

Phase II:

Mitigation Strategy Planning:

- *Identifying tools to reduce the problems*
- *Evaluating and selecting the mitigation tools*

Mitigation Tools

"Hard" Options

"Soft" Options

Hybrid Options: Plantations and land use controls

Selecting and Evaluating Options

Strategies Consider:

- Social factors
- Economic Implications
- Eco-systems
- Institutional factors

Phase III: Implementation

Implementation Framework:

Integrated decision making based on cost benefit analysis

Cost-Benefit Evaluation

7 Key Criteria:

- Effectiveness
- Time to Implement
- Permanence
- Cost
- Technical Feasibility
- Social/Political Feasibility
- Environmental Impacts

Bank Stabilization Case Study

Hard Options

Soft Options

Hilo Tsunami Recovery

Plan Elements
- ❑ Breakwater
- ❑ Tsunami Forest
- ❑ Park
- ❑ Land Use restrictions

No participatory involvement

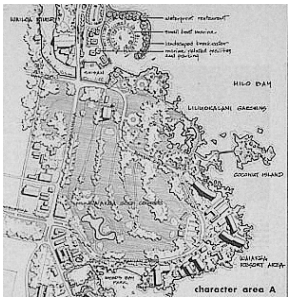
Hilo Keaukaha Regional Plan

Keaukaha Sub-regional Plan

Plan Elements
- ❑ Regional approach
- ❑ Shoreline management zone
- ❑ Multiple land uses
- ❑ Coastal road realigned
- ❑ Character/lands use areas
- ❑ Multi-sector participation

Keaukaha Project Scale

Plan Elements
- ❑ Coastal roadway realigned
- ❑ Tree buffer
- ❑ Wetland preservation
- ❑ Land Use Regulations
- ❑ Building Code Regulations
- ❑ Public Private Commitment



Implementation=Institutional Leadership

Management Program to oversee

- Integrated coordination
- Prioritization
- Enforcement

Conclusions

Integrative planning can establish a framework within which to prioritize locations for forests, and vegetation buffers.