Linking Decisions to Stakeholder Values in the Guánica Bay Watershed, Puerto Rico

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Structured Decision-Making

An organized approach to integrate facts (Scientific Knowledge) and values (Stakeholder Concerns)

- Clarify the decision context
- Define objectives and measures
- Develop alternatives
- Estimate consequences
- Evaluate tradeoffs and select
- Implement, monitor and review
The Decision Context

• The problem, issue, or reason for making a decision.
• Defines the scope of the information that will be needed.
• The USCRTF Guánica Bay Watershed decision context focused on land-based sources of pollution and potential impacts on coral reefs.
Coral Reef Ecosystem Services

Tourism & Recreation

Fishing

Ecosystem Integrity

(supporting service)

Natural Products

Shoreline Protection

Principe et al. 2012. EPA/600/R-11/206c
Decision Support Workshop
La Parguera, PR – April 2010

- Focused on 2008 Watershed Management Plan
- Delivered information on ecosystem services
- Identified priority environmental issues
- Characterized what decisions are made and how
- Elaborated potential management options
- Engaged clients
**DPSIR Framework**

**Response Decisions**

**Response**: What are the options under consideration?

**Drivers Economic Sectors**

**Drivers**: What socio-economic sectors may be impacted by decisions?

**Pressures Human Activities**

**Pressures**: Why is this management action proposed? What pressures might be associated with it?

**State Ecosystems**

**State**: What affect do these pressures have on the ecosystem?

**Impact Ecosystem Services**

**Impact**: Why do we care? What benefits from the reef do we stand to lose?

**Proposed Management Actions**

- Agricultural Practices
- Lagoon Restoration
- Reservoir Restoration & Maintenance
- Sewage/Waste Management
- Riparian Restoration
Decision Landscape

A characterization of issues surrounding a potential decision, such as the scale, science underpinnings, decision-makers and affected stakeholders.

Workshop participants elevated several important factors for developing a complete decision landscape:

• Communities linked by a complex hydrologic system
• Impact of LBSP on coral reefs is not understood
• Need to develop potential tradeoffs between management options
• The positive effects of reducing sediment in the watershed reach far beyond protection of coral reefs.
• Authorities for action are unclear.
A type of primary research that involves locating, evaluating, and systematically interpreting and analyzing information from original archival records.

Archival research was focused on:

1) construction of infrastructure (hydroelectric plants, dams, and other infrastructure for electricity; sanitary sewer systems and municipal stormwater systems; and irrigation infrastructure to support farming and provide drinking water)

2) agriculture (shifts from sugar cane to other crops, and from shade-grown to sun-grown and back to shade-grown coffee; draining the historic Guánica Lagoon and the decision to make Lajas Valley an agricultural reserve)
The Guánica Bay watershed has:

- A rich cultural history (Taino Indians, Spanish colonization, African slaves)
- A long history of agriculture
  - Prior to 1600s - subsistence farming
  - Mid-1600s - tobacco the main export crop
  - 1900s – sugar cane the main export crop
  - 1980s – rise of sun-grown coffee
- A history of exploitation (first Spain and the U.S.)
- Operation Bootstrap – industrialized agriculture along the southern coast of Puerto Rico by providing irrigation and cheap hydroelectric energy for pumping water onto fields
Purpose:
To examine how decision-makers and natural resource users engage in the management of non-market resources in the Guánica Bay watershed.
Decision-Making Workshop

Findings

• Lack of local involvement and influence in decisions being made
• Decisions were often contradictory to local needs and local vision
• Agriculture, fishing and eco-tourism are important, but need active management to become sustainable
Goals:

- Identify stakeholder objectives across the Guánica Bay watershed
- Examine tradeoffs and intended/unintended consequences
- Prioritize possible management actions for achieving multiple values

Making decisions based on ‘what is important’ is the basis of value-focused decision-making and is fundamentally distinct from the more common alternative-focused decision-making.
Breakout groups to discuss what they felt was important in the watershed

- Developed and presented an initial list of objectives
- Created performance measures for each objective
- Developed a list of high priority actions
Public Values Forum
Results

• Stakeholders have a wide range of values for the watershed, including: coral reefs, agriculture, fishing, human health, law enforcement, water availability, and environmental education
• Participants gained an appreciation for the effects that any given decision might have on the multiple objectives and a better understanding of the need for valuation and tradeoff analysis
• Groundwork was laid in the workshop for recognizing the difference between value-focused thinking (why) and alternative-focused thinking (how)
Conclusions

- Watershed restoration projects should be as much a social undertaking as an ecological one.
- Putting values at the forefront of decision-making brings less contention as the public has greater awareness that agencies are working for the common good.
- Using a systems-thinking framework (DPSIR) is essential when dealing with complex problems.
- Engage the stakeholders at the beginning and throughout the process.

Report on workshops is in review