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Water Resources Management in an Ecosystem Context: System Dynamics and System Management
Outline

- Background - Current Importance of Ecosystem Approaches
- Translating Words into Action
- Systematic Approaches
- Basic System Dynamics
- Past Trends
- Management Changes
- Case Studies
- Conclusions
Objectives

- Set IWRPM in a systematic context
- Outline how we can practically work in this context
Background

- Unintended consequences of water management
- Slow learning process over the years
- Current intentional agency interest in ecosystem approaches
- Integrated Land and Water Initiatives
  - World Bank, UNPP, UNEP, FAO GEF
Translating Words into Action

- Developing a systematic approach
- Understanding basic system dynamics
- Identifying past trends
- Inserting management changes
- Ongoing monitoring and feedback
- Use of models
Systematic Approach

- In principle identify major systems involved
  - Surface and sub-surface water systems
  - Ecosystem types - identify key biological indicators
  - Human systems and interferences: visible on the ground and intangible
- In practice identify key linkages
  - Impact of management activities on these key linkages
Understanding Basic System Dynamics

- Issues such as
  - Surface - subsurface interactions
  - Upstream and downstream impacts
  - Importance of extreme events
  - Dynamics of hydrology
Identifying Past Trends

- Nothing is stable
- Use land use change as a surrogate
- Assess hydrologic / meteorological data
- Identify patterns of fluctuation or change
Management Changes

- How will management changes influence the system?
- By changing
  - water system dynamics
  - biological systems
  - people relations
- Which may change ecosystem balance
On Going Monitoring and Feedback

- Identify key elements to monitor
  - Biological indicators
  - Land use Indicators
  - Hydrologic indicators
Models

- Develop models of the system
- Develop linkage changes of possible cause and effect
- Development of numerical models of system components
Case Studies

- Kissimmee
- Cameroon
Conclusions

- You Decide
- Discuss
References

- Operational Program 12. Integrated Ecosystem Management. Global Environmental Facility W.D.C.
- Operational Program 9. Integrated Land & Water Multiple Floral Area. Global Environmental Facility Fanlly