

Mekong River Commission ERA Training Course

Water Quality Management - Ecological Approach



To be covered

- **Context - issues**
- **Characteristics on natural systems - river systems**
- **Ecological (biological) basis for NRM management**

Issues

- Many (most) rivers, wetlands & floodplains are degraded
- Much of the focus has been on water quality problems (e.g. salinity, toxicity, DO reduction, algal blooms)
- BUT also many other problems that impact on the ecological health of aquatic systems, e.g.
 - Bed & bank erosion
 - Loss of habitat
 - Lack of flow
 - Loss & degradation of riparian zone
 - Alien species (e.g. plants & animals)

- Millions spend p.a. on restoration of degraded ecosystems
- But little of this work is underpinned by a strong science base
- Has been little attempt to measure the environmental benefits

Characteristics of natural systems

- Variable, uncertainty
- Complex interrelations
- Multiple components (multivariate analysis)
- Most systems have been modified by humans

River Management - Past

- Management focused on:
 - prevention of bed & bank erosion
 - flood prevention
 - point sources of pollution
- Water quality
 - focused on physical & chemical stressors
 - drinking water & irrigation uses

River Management - Past

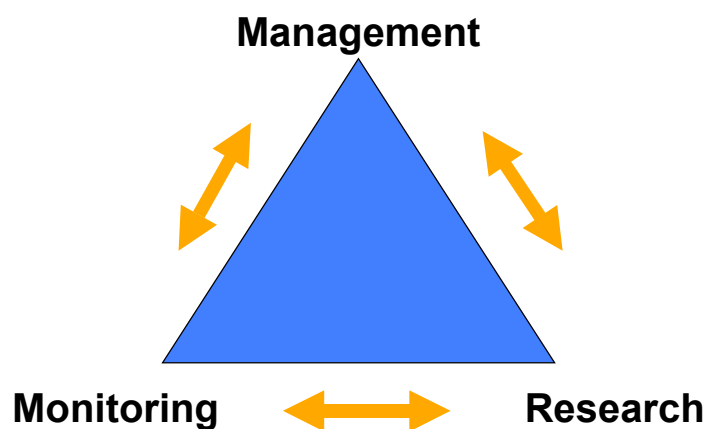
- Biological/ecological quality
 - Little consideration
- Linkages with catchment NOT considered
 - Diffuse/non-point source pollution (sediment, nutrients, contaminants, salinity, organic matter)
- Little attempt to measure performance of management actions

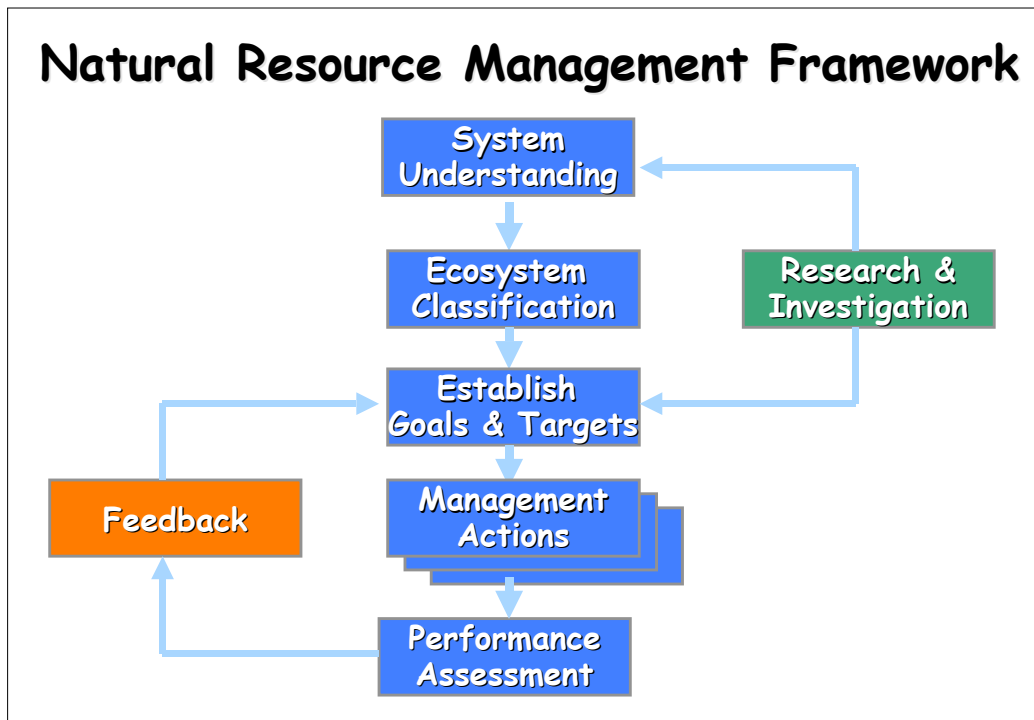
River Management - New

- Managing highly variable systems
Responsive, flexible, adaptive
- Managing to maintain ecological integrity
New knowledge and skills needed
- Managing the whole system
Integrated catchment management
- Managing for the community
Collaboration
- Measurement of performance
Accountability

Ecosystem Approach

- Ecosystem focused
- Scientific underpinning - must understanding system (prediction)
- Identify issues
- Ecosystem protection targets
- Risk-based management
- Performance assessment





Where to from here?

- Must be better coupling of the components in natural resource management, e.g. river **MUST** be linked to its catchment
- Integrated natural resource management is needed
- Move to more knowledge-based management
- New tools & better planning) needed to handle:
 - complex inter-relationships
 - multi-component interactions
 - Variability, uncertainty
- Risk-based approaches can help