

# Examples of Valuation in Practical River Basin Management

## Decisions on allocating flows

- When planning the use of water resources, what are the costs of taking water away from ecosystems?
- Do benefits of other water uses exceed these costs?
- How can this information change decisions?

# Case studies

- Okavango Delta
- Pallisa District, Eastern Uganda
- Zambezi Basin, Southern Africa
- Tropical rainforest tourism, Costa Rica
- Lower Shire Wetlands, Malawi and Mozambique, and Barotse Floodplain, Zambia
- Phnom Bokor National Park, Cambodia



# Okavango Delta

- Study valued the Okavango Delta Ramsar Site
- Direct use values → non-consumptive tourism, hunting tourism, household livestock production, household crop production, and household harvesting and processing of natural resource products
- Indirect use values → carbon sequestration, groundwater recharge, water purification, wildlife refuge functions and provision of scientific and educational value
- The Ramsar site has a total annual impact on the GNP amounting to P1.2 billion, or 2.6% of the total national GNP.

# Wetlands or Wastelands in Uganda

- One third (71,100 ha) of Pallisa District in Eastern Uganda is occupied by wetlands
- Wetland goods and services generate high economic benefit but little was known of value
- Direct use → agriculture, handcraft and building materials, fish and wild vegetables, medicines, transport
- Indirect use → Flood control, water purification and maintenance of year round water supplies
- Wetland goods and services = US\$34 million/year to Pallisa District



# Zambezi Basin, South Africa

- Zambezi runs through Angola, Botswana, Namibia, Zimbabwe, Malawi and Mozambique
- Associated with a large number of wetlands
- Products and services → flood recession agriculture, fish, wildlife, grazing, forest resources, natural products and medicines, and tourism
- Market prices used to estimate value of wetlands
  - i.e. Fish catches valued at local sale price, Tourism earnings used to calculate wildlife value
- Marginal value of \$145 million/year for 10 major wetlands (\$48/ha)



# Tropical rainforest tourism, Costa Rica

- Monteverde Cloud Forest Biological Reserve is an important tourist destination
- Surveyed Costa Rican visitors on information about costs of visiting Reserve
  - Out of pocket expenses (food, petrol)
  - Fixed costs (park fees)
  - Travel time
- Travel costs yielded an annual consumer surplus of US\$2.4-2.9 million, or \$35 per domestic visit → value of rainforest for tourism

# Lower Shire Wetlands and Barotse Floodplain

- Lower Shire Wetlands and Barotse Floodplain cover an area of 1.5 million hectares in Malawi, Mozambique and Zambia
- Generate important goods and services including flood attenuation
- Value of flood attenuation estimated through costs of damage avoided by conserving wetlands (indirect use)
  - Temporary relocation of people
  - Replacement of roads and rail infrastructure
  - Loss of farm fields and livestock
  - Settlements destroyed
- Flood attenuation value for wetlands and flood plain = US\$3 million

# Phnom Bokor National Park, Cambodia

- Covers an area of ~1,500 km<sup>2</sup> in the coastal zone of south-west Cambodia
- Forms watershed that includes Kamchay River
- Planned Kamchay hydropower scheme to meet electricity demand
- Continuing degradation of watershed would affect operation and profitability of dam
  - Increased sediment → reduce service life of dam
  - Reduced storage capacity → power generation losses
- Lack of investment in upper watershed management in the Park would result in loss of revenues of \$2 million
- Influence on decision-making for land use and water management

# Please share your experiences

## Do you have...

- Examples of valuation studies?
- Assessments/inventories of the benefits of ecosystem services in your river basin?
- Costs and benefits of watershed conservation?