

Systems Approaches to Coastal Zone Management in Bali, Indonesia

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The coastal area of Bali, Indonesia consists of a complex mosaic of ecosystems, including offshore marine waters, coral reefs, estuaries, mangrove forests, seagrass beds, beaches and dunes. The marine and coastal waters and adjacent lands support a wide variety of important economic activities such as fisheries, aquaculture, agriculture, forestry, tourism, settlement, transportation and communications. Due to the competing elements of these sectors there exists a high level of competition for coastal resources resulting in incompatible land use and widespread environmental impacts. Furthermore, coastal management in Indonesia and Bali in particular is mostly ad hoc and sectoral. Little cross-sectoral or integrated planning policy exists. Each sectoral agency has its own function and often disregards its cross-sectoral impacts on and relationships with various coastal ecosystems. This has caused overlapping of mandates and conflict of interests among agencies. In addition, current environmental assessments are on a project by project basis. Efforts are needed to incorporate systematic approaches that go beyond projects and seek to understand cumulative interactions on a more regional level.

The purpose of this paper is to examine systems approaches that can be applied to interrelated problems of coastal zone management in Bali. This would include a critique of scoping techniques (delphi, roundtables, workshops), modelling techniques (conceptual, network, simulation, adaptive environmental assessment), integrated resource surveys (geographic information systems, remote sensing, applied human ecology), integrated resource management frameworks (biosphere reserves, parks and protected area conservation, multi-use management plans, linked management) and redevelopment and rehabilitation (structural, non structural).

Appropriate interdisciplinary techniques and frameworks will be proposed as integrated planning and management strategies for the conservation of linked ecosystems, notably coral reefs, mangroves and seagrass beds. Specific policies will be recommended for inclusion in the next five year planning cycle in Indonesia (REPELITA VI, 1994-1999).

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