

Principles for integrated island management in the tropical Pacific

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We propose a new approach for island-wide planning and implementation of ecosystem management in the Pacific, recognizing a lack of replicability, sustainability and cost-effectiveness in other approaches. 'Integrated island management' (IIM) operates through coordinated networks of institutions and communities focused on sustainable and adaptive management of natural resources. IIM enables simultaneous and cost-effective achievement of ecosystem-based management, climate change adaptation and disaster risk reduction while conserving biodiversity, maintaining ecosystem services and securing human health and well-being. We present ten guiding principles for IIM, and then use these to evaluate 36 case studies from the Pacific islands. Most case studies were pilot or demonstration projects with little evidence of planning to ensure long-term financial and human capacity needs were sustained, beyond the life of the projects, or could be replicated at significant scales. Management outcomes in the Pacific will be enhanced by: (1) building on foundations of customary management practice and social networks; (2) working holistically across relevant ecological and governance scales, through coordinated but decentralized and nested institutions; (3) empowering local communities to participate in integrated planning and implementation; and (4) embedding IIM practice into national systems for long-term sustainability and replication. These also ultimately depend on the context and externalities, beyond the control of practitioners. Cost-effectiveness and appropriateness are also critical for successful IIM in the Pacific islands but ultimately there is little alternative for effective biodiversity conservation.

Key words: integrated island management, sustainability, institutional coordination, socio-ecological systems, participatory management, climate adaptation, vulnerability

INTRODUCTION

ISLANDS are isolated, promoting unique biological and cultural attributes but equally making them highly vulnerable to physical, biological and anthropogenic disturbance, particularly in the Pacific (Elton 1958; Connell 1984; Barnett 2001; Barnett 2011). Islands have highly specialized species (MacArthur and Wilson 1967) and connectivity between land and sea (Jenkins *et al.* 2010), as well as between different island ecosystems. As a result, natural or anthropogenic disturbances can seriously affect species and ecological processes in adjacent and connected ecosystems (O'Neill 2001). In small Pacific Islands with tight feedback loops between ecological and social systems, resource limitations become readily apparent, forcing people to rapidly adjust and adapt to environmental and climate change (Berkes 2012).

Various environmental management approaches have been applied to safeguard ecosystem functionality and service provision and maintain or increase the adaptive capacity of Pacific Island socio-ecological systems. These include climate change adaptation (CCA); community-based adaptive management (CBAM);

customary management (CM); disaster risk reduction (DRR); ecosystem-based adaptation (EBA); ecosystem-based management (EBM); ecosystem-based fisheries management (EBFM); integrated coastal zone management (ICZM); integrated water resource management (IWRM); and water, sanitation and hygiene (WASH; Table 1). They overlap considerably (e.g., Mercer 2010; Govan *et al.* 2011; Aswani *et al.* 2012) and yet, they are often implemented through narrowly focussed projects or duplicated across different agencies, consequently wasting resources that could have been more efficiently allocated with more coordinated planning and implementation.

The Pacific Island region (the 'Pacific') has over-invested in expensive pilot projects, with little evidence of successful replication, scale-ability or long-term sustainable practice (Billé 2010). Most environmental management projects, regardless of the island or coordinating organization, suffer lapses in continuity and hence overall success because of frequent turnovers in key personnel, short-term funding cycles and changing financial landscapes. Successful environmental management typically requires large investment at the outset, tapering over time.

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