

A matrix approach to tropical marine ecosystem service assessments in South east Asia

ABSTRACT

Ecosystem service assessments are increasingly used to support natural resource management, but there is a bias in their application towards terrestrial systems and higher income countries. Tropical marine applications are particularly scarce, especially in SE Asia. Given the growing coastal population and expansion in blue economy sectors in SE Asia, evidence to support effective marine planning, such as ecosystem service assessments, is urgently needed. Data deficiencies for marine systems, especially (but not only) in lower income countries is a significant obstacle for ecosystem service assessments. To overcome this, we develop an ecosystem service potential matrix which combines evidence taken from an extensive literature review together with expert opinion. The matrix includes both natural and modified habitats as the service providing units. The ecosystem service potential for habitats are scored at the macro level (e.g. mangrove) due to insufficient evidence to score micro-habitats (e.g. fringe, basin or riverine mangroves). The majority of evidence is available for biogenic habitats (mangroves, coral reefs and seagrass meadows) with comparatively little for sedimentary habitats. While provisioning, regulating and cultural services are scored, published evidence is more readily available for provisioning and regulating services. Confidence scores, indicating the uncertainty in the ecosystem service potential scores are included in the matrix. To our knowledge this is the first attempt to systematically capture the provision of ecosystem services from tropical marine habitats. Although initially developed for four marine biosphere reserves and protected areas in SE Asia, the generic nature of the evidence included suggests that the matrix constitutes a valuable baseline for marine ecosystem service assessments within SE Asia and provides a robust foundation for development in future work.