RSTC-TC-S1 WP.8
Date: 5 February 2020
Original: English

First Series Technical Consultation of the Regional Scientific and Technical Committee for the GEF Pacific Ridge to Reef Programme

Nadi, Fiji 5th February 2020

Session 3, Topic 1

R2R conceptual Framework on spatial prioritization procedure

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Summary:

The paper presents the steps to adapt and apply a fine-scale spatially-explicit decision support framework to support planning for upscaling future R2R investments at the national and local scale. The land-sea framework can help identify where to prioritize terrestrial conservation initiatives that maximize downstream benefits and test proposed terrestrial and marine protection/restoration policy actions and model their effects on marine resources. We adapted the framework to Vanuatu and implemented it at the national scale and in an IW R2R project demonstration site, Tagabe watershed (Efate Island). Our study found that deforestation resulting from urbanization and commercial agriculture expansion increases sedimentation while forest restoration mitigates sedimentation. Our results supported previous studies in showing a negative effect of sediments on coral abundance and fish biomass. Accordingly, our models projected increases in both corals and fishes that scaled with area of forest restored so that more trees resulted in more corals and fishes. Marine protection was also shown to support fishery outcomes. Conversely, an increase in urbanization (and associated deforestation) caused declines in coral cover and reef fisheries. A combination of terrestrial forest restoration and marine protection from fishing resulted in the best outcomes for coral reefs and associated fisheries. Outcomes include: 1) Identification of priority conservation areas on the land that will have the greatest impact on marine conservation in Vanuatu; 2) testing of policy actions prior implementation, and 3) development of a decision support tool to identify synergies and trade-offs in habitat conservation across terrestrial and marine ecosystems at an archipelago scale.

Research questions:

The RSTC technical consultation is invited to:-

(i) To discuss the national R2R efforts in Vanuatu and provide management insights for linked watershed and reef systems, we address the following three research questions:
   a. Where are the coral reef areas potentially vulnerable to change in sediment runoff?
   b. Which watersheds are linked to coral reef areas through sediment runoff?

c. Where are the land areas most prone to sediment erosion that can be prioritized for conservation?

(ii) To discuss the local R2R efforts in Vanuatu and provide management insights for linked watershed and reef systems, we address the following three research questions:

a. How does sediment runoff influence coral reef benthic and fish indicators?
b. Where do proposed forest restoration actions or forest loss from agriculture expansion and urbanization impact coral reefs due to differences in sediment runoff?
c. How do marine areas respond to proposed marine management actions alone and in combination with forest and agriculture land-use restoration and urbanization scenarios?