



The Research Group  
Ecology, Evolution & Genetics

has the honor to invite you to the public defence of the PhD thesis of

## Meenakshi Shankar Poti

to obtain the degree of Doctor of Sciences

Joint PhD with Université Libre de Bruxelles

Title of the PhD thesis:

**Navigating environmental change and governance  
in Indian Ocean small islands:  
Mangrove social-ecological and governance responses  
in the Andaman and Nicobar Islands, India**

### Promotors:

Prof. dr. Farid Dahdouh-Guebas (ULB-VUB)  
Prof. dr. Jean Hugé (Open University of the  
Netherlands)  
Em. Prof. dr. Nico Koedam (VUB)

The defence will take place on

**Friday, November 15, 2024 at 4:00  
p.m. in ULB, Forum C, Plaine Campus,  
Boulevard du Triomphe, Ixelles**

### Members of the jury

Prof. dr. Iris Stiers (VUB, chair)  
Prof. dr. Martine Vercauteren (ULB, secretary)  
Prof. dr. Esméralda Longepe (Université de  
Paris 1 Panthéon Sorbonne, FR)  
Prof. dr. Nibedita Mukherjee (Brunel University  
London, UK)

### Curriculum vitae

Meenakshi holds an Erasmus Mundus Master's in Tropical Biodiversity and Ecosystems (TROPIMUNDO) from Université libre de Bruxelles, Vrije Universiteit Brussel, and Università degli Studi di Firenze (2016-2018). She has interned at the European Commission's DG Environment and has experience in science communication and youth environmental advocacy at various international forums including the UNESCO MangRES project in Latin America and the UN CBD. During her PhD, she co-authored 8 peer-reviewed articles and presented 11 oral presentations and 9 posters at 8 international conferences.

### Abstract of the PhD research

This PhD thesis focuses on environmental change and the resulting governance responses (or lack thereof) in small island social-ecological systems (SESs) in the Indian Ocean. To mitigate the growing risks and impacts of environmental change, effective governance responses are essential. First, a systematic literature review was conducted, providing an overview of environmental change drivers, response types, actors involved in the responses and a conceptual scheme of response effectiveness in nine small island states and territories in the Western Indian Ocean (WIO). The findings show that while these island SESs face similar drivers and impacts, their response strategies—ranging from institutional and social measures to infrastructural and ecological restoration—differ widely. Response effectiveness depends on resource availability, knowledge integration, governance structures, and ongoing learning and monitoring processes. Ignoring these context-specific nuances can undermine response effectiveness, leading to conflict and maladaptation. Subsequently, the focus of this thesis rests on the Andaman and Nicobar Islands (ANI) in India. Despite the growing strategic and developmental interests, centralised governance systems, complex migration history, multicultural population, and ecological importance, the ANI have received limited research and policy attention. A survey was conducted with 105 researchers and practitioners, identifying four primary drivers of change in the ANI—socio-economic development; demographic changes; environmental hazards and climate change; and governance and policy—along with 24 research and management priorities. This is followed by the specific case study of mangrove SESs in the ANI, particularly following the 2004 Sumatra-Andaman earthquake and tsunami. This event resulted in drastic topography changes—land subsidence in Nicobar and South Andaman and land upliftment in North Andaman—altering sea levels and tidal patterns and severely disturbing mangrove ecosystems. We used semi-structured interviews with 62 stakeholders and document analysis to assess mangrove governance and associated stakeholder perceptions in the Andamans. The findings highlight governance challenges due to post-tsunami conditions, top-down governance arrangements, mainland influence, and poor inter-departmental coordination. Finally, we applied the Adaptive Cycle (AC) framework to examine the responses of both human communities and mangrove ecosystems to the 2004 tsunami and coastal subsidence in the Nicobar Islands, which led to a 97% loss of mangroves and the formation of new intertidal areas. By integrating social and ecological insights, this thesis contributes to the development of a knowledge base that can inform future research and decision-making processes in small island SESs that face multiple drivers of change.