An aerial photograph of a tropical atoll, likely in the Pacific Ocean. The image shows several small, dark green islands covered in dense vegetation, surrounded by shallow, turquoise water with visible coral reef structures. The water transitions from a light turquoise near the shore to a deep blue further out. The overall scene is a beautiful representation of a healthy marine ecosystem.

# Status of climate change in the Pacific and potential for EBA: An overview

Sue Stolton, Equilibrium Research

# Presentation overview

- Brief look at climate change impacts
- EBA – an overview of options and possibilities in the Pacific
- EBA – challenges





# Vulnerable ecosystems

- Sea-level rise
- Increasing temperatures
- Changes in rainfall
- Ocean acidification
- Coral reefs
- Increased storm activity

Overall in Melanesia the central mountains of New Guinea and the coral reefs and ocean life in the outer islands of Papua New Guinea most impacted. In the wider Pacific inundation is a major threat.





# Vulnerable species

- Biodiversity hotspot
- High levels of endemism
- Small isolated populations
- New species being described

Mangrove and coastal systems, montane systems and dryland vegetation communities most at risk . Species in high elevation areas, in isolated or outlying mountain ranges, on smaller islands, or exploited for human use and under stress are most vulnerable. Threat and spread of invasive species.



# Vulnerable people

- NTFPs plants for subsistence and well-being
- Soil fertility and agricultural productivity
- Vulnerability to natural disasters
- Coastal/island dwellers livelihoods
- Subsistence fisheries vital for nutrition and food security
- Water stress leading to health impacts



# The challenge

- **Ecosystem-based adaptation (EBA)** is the use of biodiversity and ecosystem services as part of adaptation strategies to help us cope with the adverse effects of climate change  
*but*
- The **Millennium Ecosystem Assessment** estimates that 60% of global ecosystem services are degraded and so these services are rapidly being lost



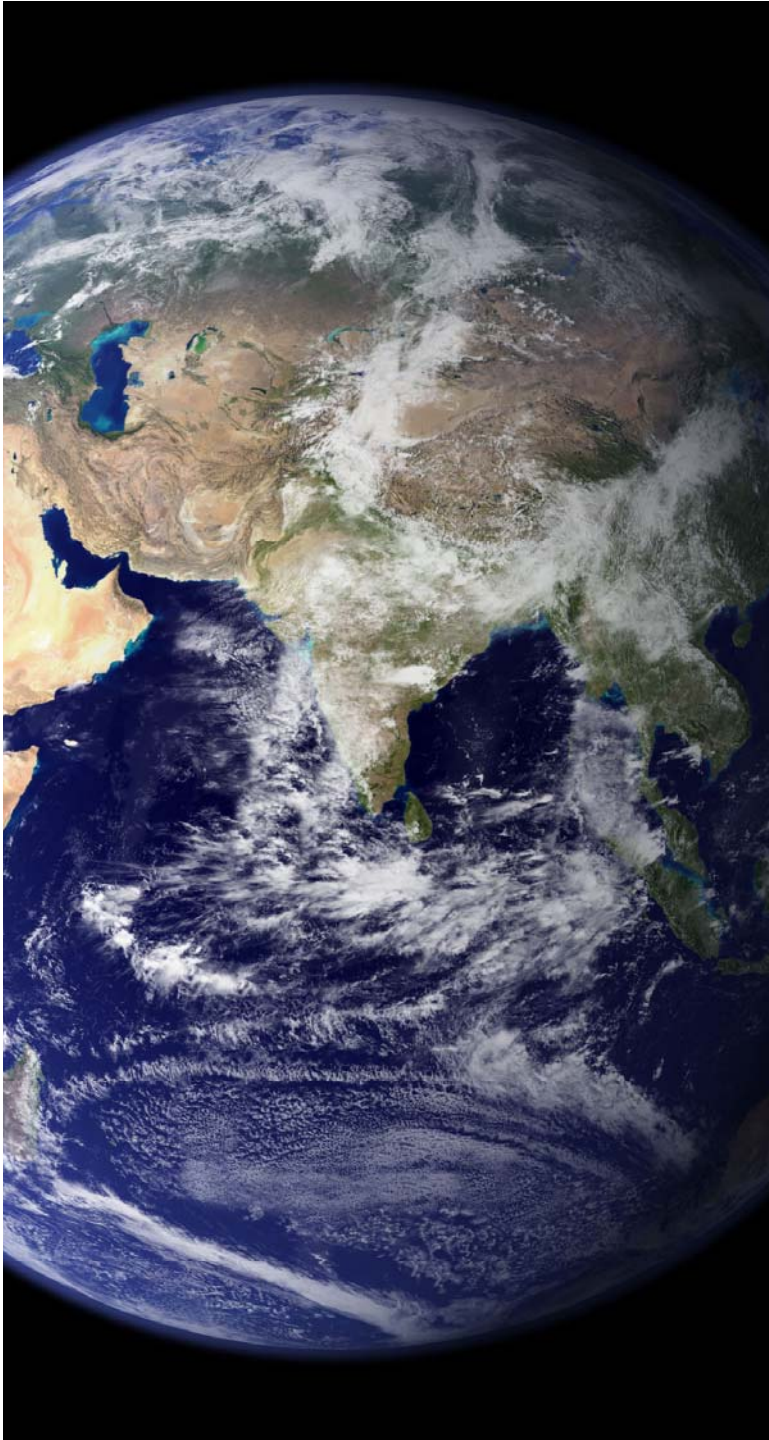
# Habitat destruction

- Long-term threats such as climate change pose a potentially huge threat to ecosystems, biodiversity and human well-being in the region

*but*

- Short-term pressures such as land use change and resource use are a more immediate challenge and are likely to increase the impacts of climate change and decrease the effectiveness of EBA





# Adapting to climate change

- Measures are needed to maintain the **resilience of ecosystems** by reducing pressures and threats and under new climatic conditions caused by climate change —so that they can continue to maintain biodiversity and supply essential ecosystem services





# The opportunity

- **Protect:** maintain ecosystem integrity, buffer local climate, reduce risks/impacts from storms, droughts and sea-level rise
- **Manage:** maintain essential ecosystem services that help people cope with changes in water supplies, fisheries, spread of disease and agricultural productivity
- **Restore:** ecosystem resilience to cope with change



# EBA – the potential

Protecting, managing and restoring natural systems through the conservation of biodiversity, can contribute to climate change responses in many ways:

- **Water:** protected/well-managed forest and wetlands provide both purer water and (especially in tropical montane cloud forests) increased water flow



- **Fish resources:** marine and freshwater protection conserves and rebuild fish stocks and spillover can replenish fishing grounds
- **Health:** habitat protection to slow the expansion of vector-borne diseases that thrive in degraded ecosystems; as well as conserving traditional medicines and providing compounds for pharmaceuticals; and space for recreation and mental health benefits





- **Food:** maintaining crop wild relatives helps facilitate crop breeding; pollination services; protecting soil fertility
- **Natural disasters:** EBA can help to reduce the impact of all but the largest natural disasters:
  - **Landslides:** by stabilising soil to stop slippage or slow movement once a slip is underway
  - **Fire:** natural vegetation can limit encroachment in fire-prone areas



- **Floods:** by providing space for floodwaters to disperse and through natural vegetation absorbing the impacts of flooding
- **Storm surges:** intact natural systems such as coral reefs, barrier islands, mangroves, dunes and marshes can all help block storm surges
- **Drought and desertification:** effective management systems can control grazing pressure and intact watersheds help to keep vital water resources in soils



**A report from IUCN-WCPA, The Nature Conservancy,  
United Nations Development Programme,  
Wildlife Conservation Society, The World Bank and WWF**

**The full report can be downloaded at:  
[cmsdata.iucn.org/downloads/natural\\_solutions.pdf](https://cmsdata.iucn.org/downloads/natural_solutions.pdf)**





# EBA in the Pacific

Natural ecosystems can:

- Buffer against sea-level rise by protecting shorelines
- Protect against and adapt to impacts of natural disasters such as flooding, tidal surge, land slip and drought, all of which will increase under climate change



- Forests (particularly on slopes), coastal mangroves, coral reefs and wetlands can absorb impacts of severe weather events
- Strong evidence that protecting areas of ocean or freshwater can provide benefits in terms of increased fish abundance that extend well beyond the borders of the protected area and thus help to sustain fishing communities



- Well managed forests and wetlands can help to reduce stress on both water quality and quantity, by helping to maintain adequate supplies of pure water. (Not all forests function in this way and a thorough understanding of management needs is important to maximise the EBA).
- Overall health of an ecosystem is one of the factors that determines the likelihood of invasive species taking hold





# Challenge for EBA

- **Information base:** do we know enough to assess likely climate change impacts to plan responses
- **Policy:** enabling environment linking biodiversity and climate change policy
- **Trade-offs:** guidance on how we manage climate impacts on biodiversity and ecosystem-based adaptation strategies



- **Resilience:** research and management advice to understand how we build resilience to climate change
- **Monitoring:** when EBA projects are implemented is monitoring and assessment adequate to evaluate effectiveness
- **Partnerships:** with relevant sectors and communities – disaster relief agencies, aid agencies, water companies, fishers, farmers etc



- **Integrity of protected areas:**  
ensure that protected areas are capable of delivering potential services by ensuring:
  - effective management of current areas
  - more protection, particularly in under-represented areas such as freshwater and marine areas
  - use of all governance and management types





# What are we doing here?

- Design a project on: *Pacific biodiversity and climate change: Ecosystem-based adaptation analysis and needs assessment (PBCCEBAANA)*
- Need a snappy title
- More importantly we need your experiences, knowledge and ideas
  - Day 1 – focus on EBA experiences, tools for EBA. Knowledge gaps and how we can fill those gaps
  - Day 2 – focus on small and large scale project design

# **EBA in the Pacific**

- **What are your experiences of climate change in your country/territory?**
- **Are there any examples of ecosystem-based adaptation in your country/territory?**