‘Natural Solutions’:
Need for Ecosystem-based Adaptation to Climate Change in the Pacific Islands

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PIRT, Suva - July 2015



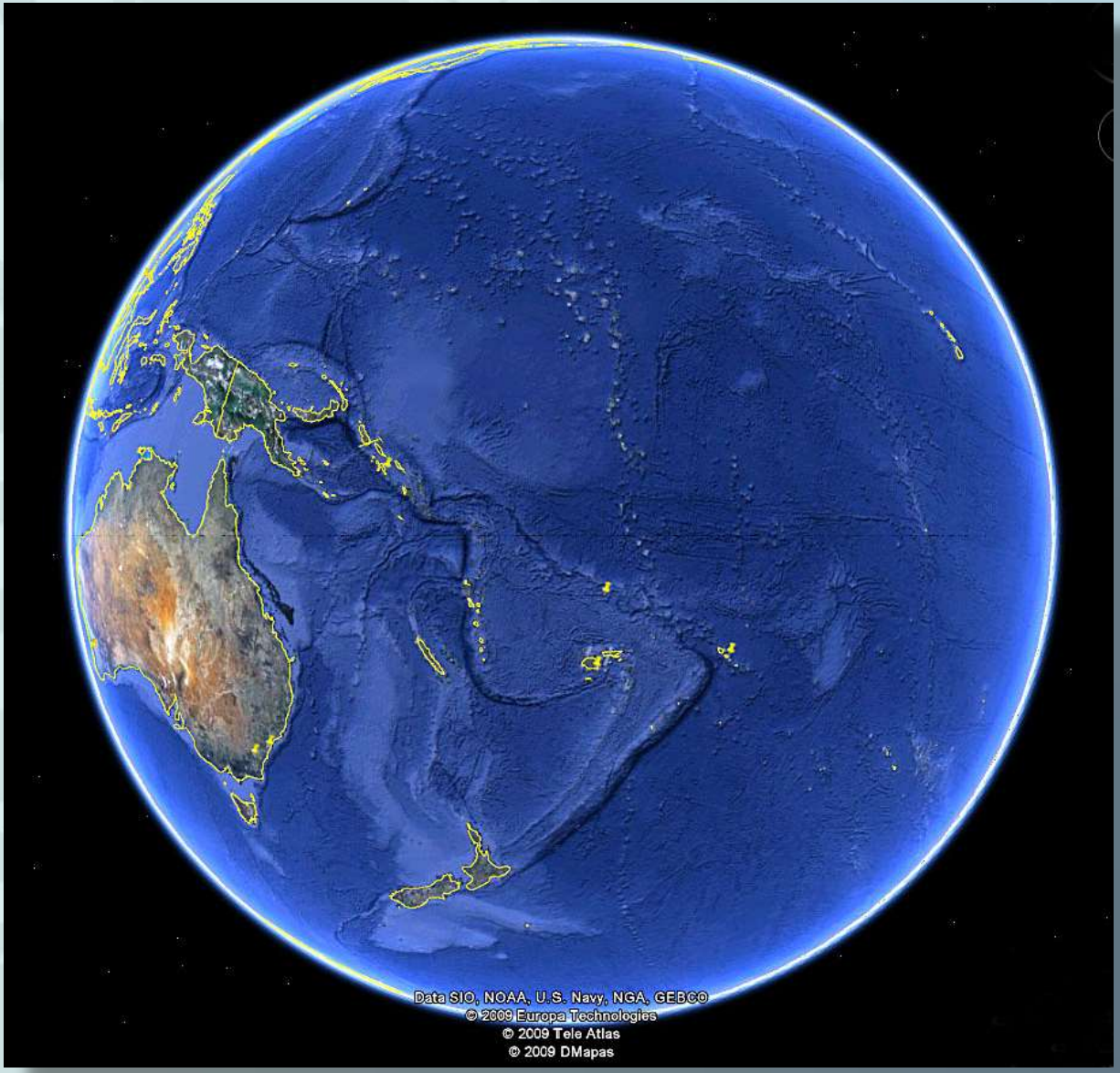


Ecosystem Perspective on Climate Change

Ecosystem Services

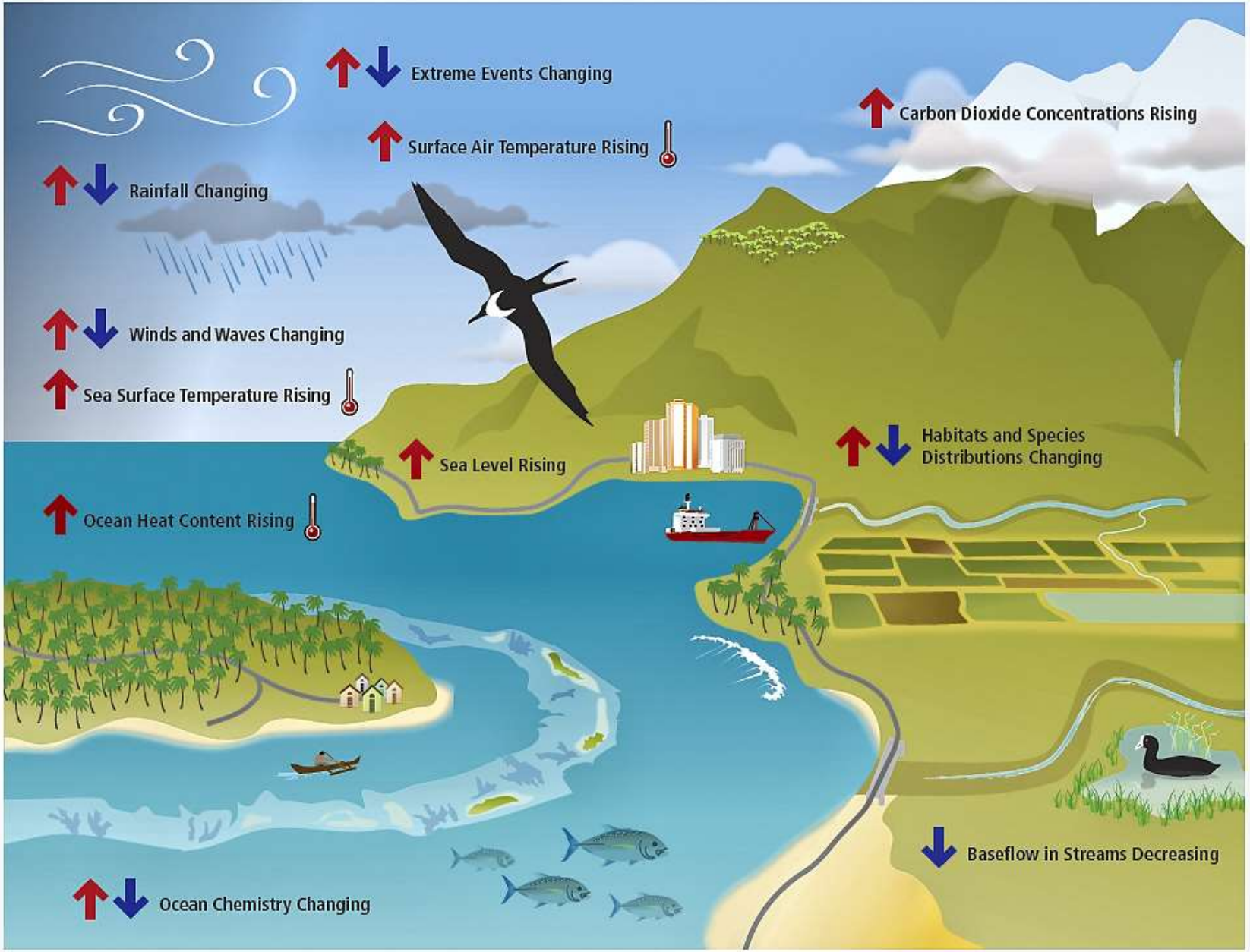


Pacific Islands Region Context: Ecosystem Approach Critical for Climate Change Adaptation

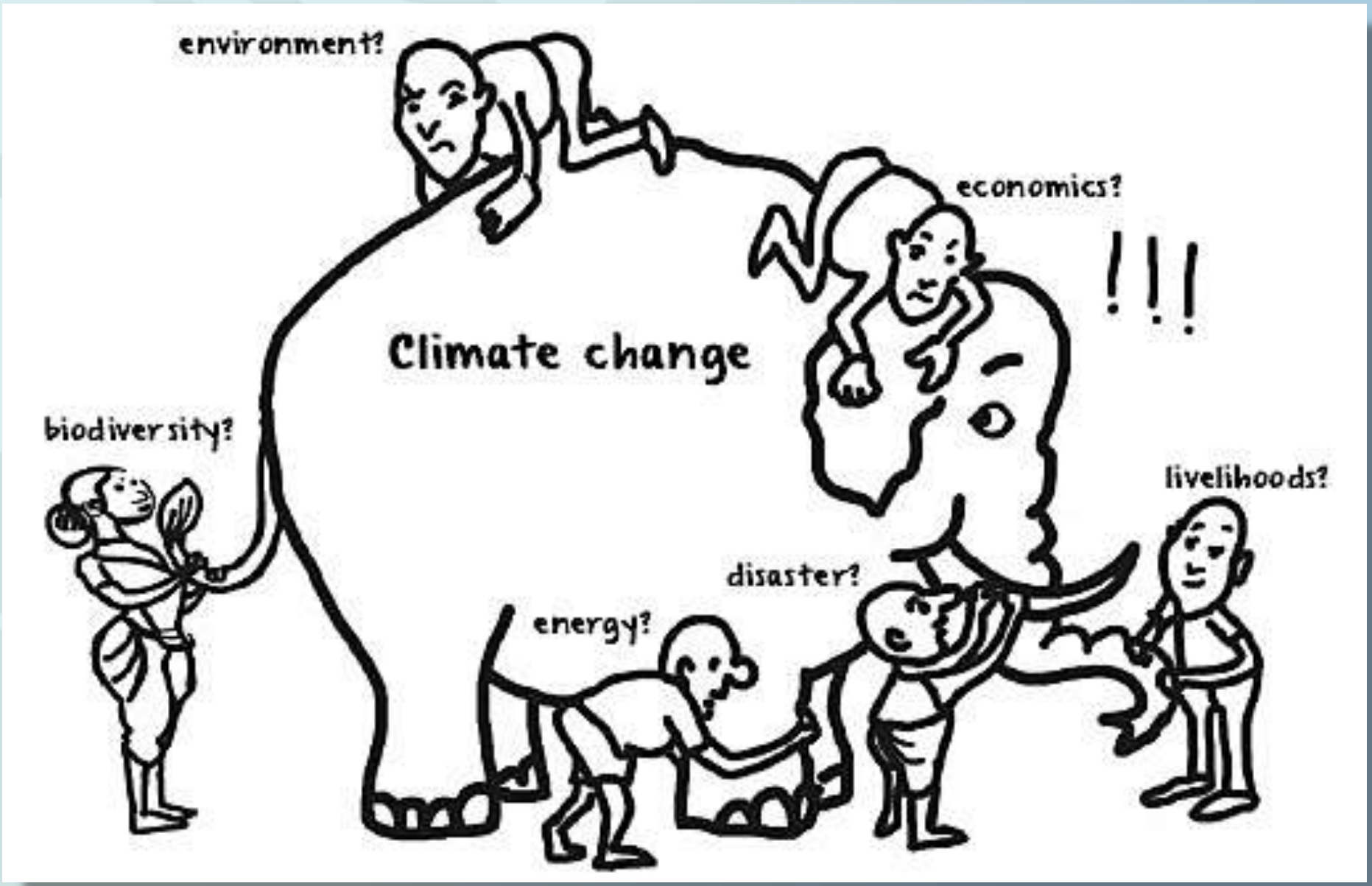


Pacific Islands Region

Climate Change in Pacific Islands Region



Are we making the links to enable effective adaptation?



Non-Climate Change Environment Issues

Mining and Logging

Pollution and Waste



Coastal Development

Unsustainable Fishing

Invasive Species

Emerging Uses

Threats identified by Choiseul communities + other known issues



Direct human impacts

- Rapidly increasing human population
- Unsustainable harvest of fish
- Logging deforestation
- Logging ponds
- Poor agricultural practice
- Mangrove removal
- Inappropriate coastal defences
- Proposed mining operations
- Invasive species
- Nutrient and sediment flow
- Inappropriate rubbish disposal

Climate change threats

- Sea level rise
- Increasing air and sea temperatures
- Rainfall increases
- More intense tropical cyclones
- Ocean acidification

Natural disasters

- Cyclones and tsunamis
- Drought
- Earthquake

Infrastructure needs

- Limited access to fresh water
- Lack of communication infrastructure
- Distance to markets
- Limited basic services
- Limited energy generation

Social challenges

- Reduced self reliance
- Cultural transition
- Gender inequities
- Foreign logging workers


PM 6040



Marine ecosystem impacts



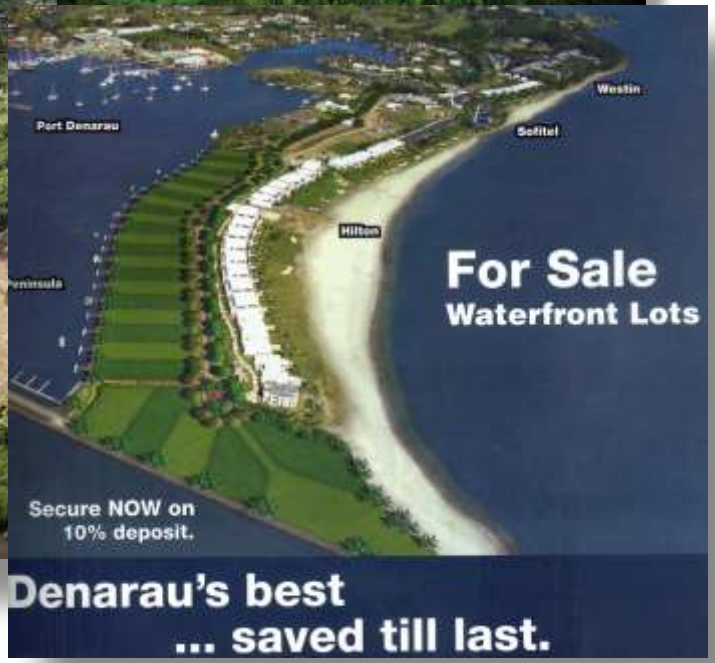
Damaging to catchments and water supplies










Port Denarau
Westin
Sofitel
Hilton
For Sale
Waterfront Lots
Secure NOW on
10% deposit.
Denarau's best
... saved till last.


POWER






© Chris Jordan




THE SNAKE THAT ATE GUAM
By Adele Conover
You could live in this tropical paradise for 30 years and never see one. You might wonder why no birds sing in the rain forest. But you'd catch on if it snapped at your derriere while you sat on the




WANTED
GIANT AFRICAN SNAIL
LOOK FOR THEM! REPORT THEM!
888-397-1517
A major landscape and agricultural pest, even eats stucco on homes
Public health threat - known to carry rat lungworm that may cause meningitis in humans
Able to reproduce rapidly - one snail can lay 1,200 eggs in a year
Can grow to up to 8 inches in length - no natural enemies
We need your help to stop this pest!
www.freshfromflorida.com/pi
USDA
PLANT INDUSTRY


Honiara


Port Vila
Image © 2013 TerraMetrics
© 2013 Google


Nuku'alofa


Bikenibeu 'Bikenibeu


Papeete
Faa'a
Fautau'a
Tipaeru'i













Lower Capacity for Resilience

Non-CC Impacts



Climate Change Impacts

Lower Capacity for Resilience





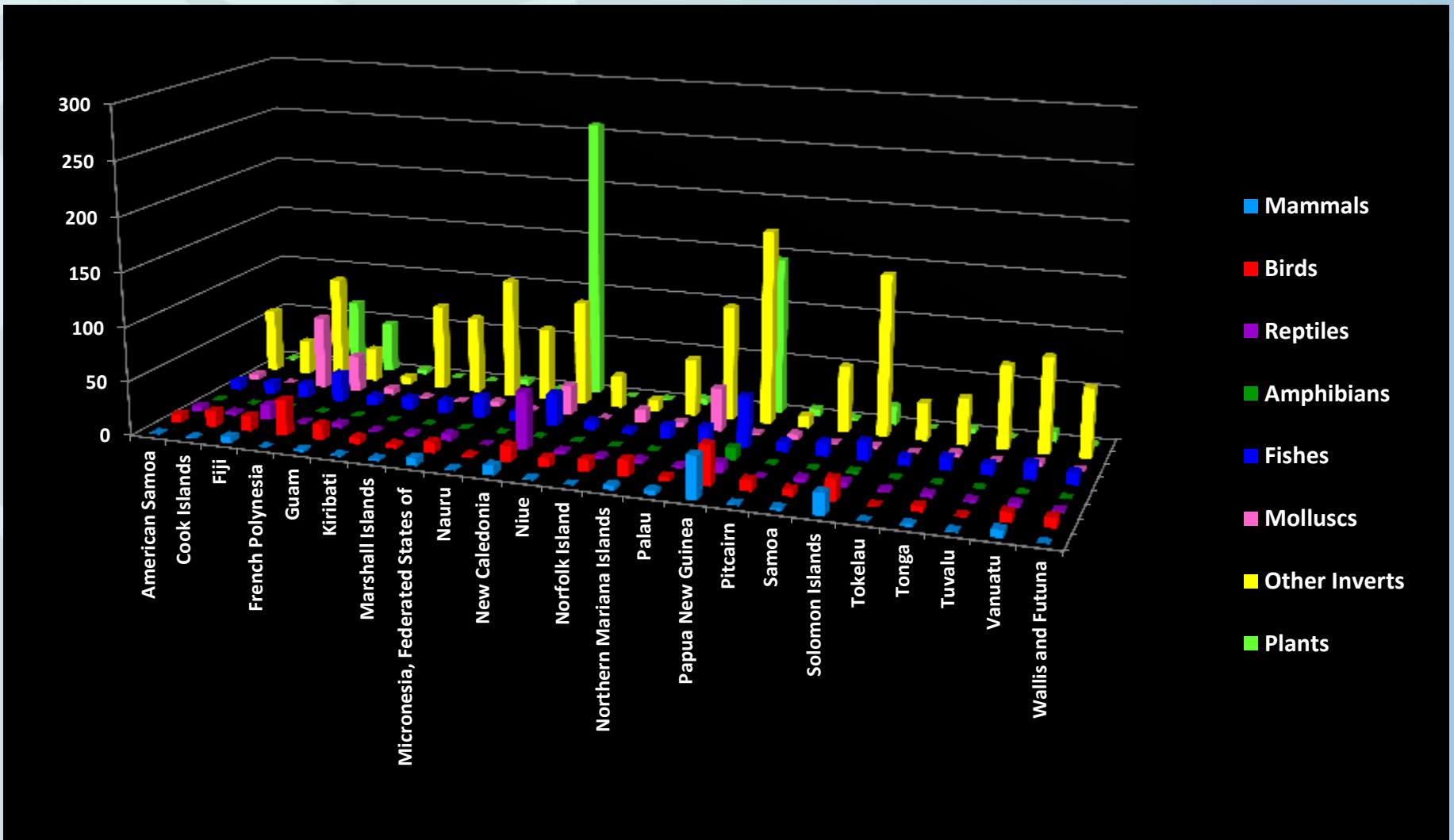







Threatened Species by Pacific Islands Country & Territory

- 21% mammals
- 13% birds
- 5% amphibians
- 60% reptiles
- 25% invertebrates
- 28% plant species



Ecosystem-based Adaptation:

By taking into account the ecosystem services on which people depend for their livelihoods and social and economic security, EbA integrates sustainable use of biodiversity and ecosystem services in a comprehensive adaptation strategy (CBD 2009)

Need to fully integrate non-climate change issues

Benefits of Ecosystem-based Adaptation

- Aligns with and enhances poverty alleviation and sustainable development strategies
- More accessible to rural and poor communities – cost effective
- Increases local engagement and action, drives resource management to rural communities
- Enables vulnerable communities to participate directly in resource management decisions

Benefits of Ecosystem-based Adaptation

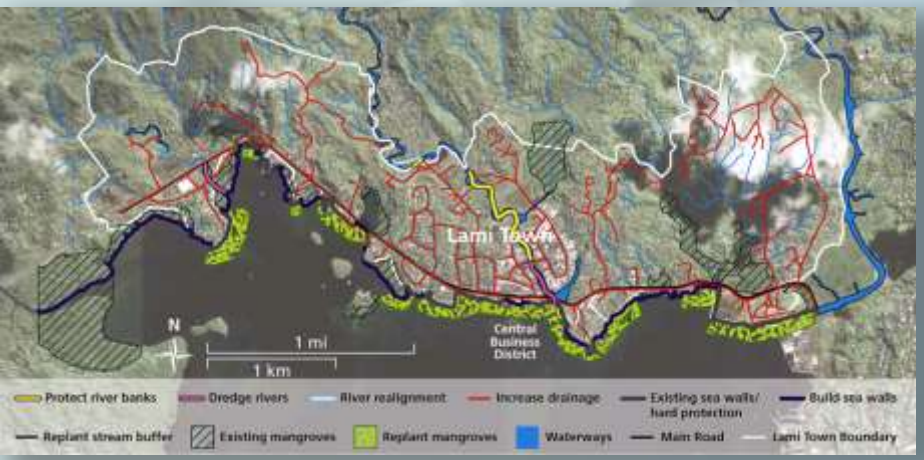
- Precautionary and addresses risk management – ensures that, long-term, natural resources that provide resilience are not destroyed by short-term or emergency responses to crisis
- Provides both protective and provisioning services
- Can contribute to climate change mitigation
- Builds on existing investments in biodiversity conservation


A comparative analysis
ecosystem-based adaptatio
and engineering optio
for Lami Town


Ecosystem-based adaptation and
climate change vulnerability
in Choiseul Province, Solomon Islands
Synthesis report
USAID
SPREP
giz


Legal Frameworks for
Ecosystem-Based Adaptation to
Climate Change in the Pacific Islands
Ben Boer and Pepe Clarke
SPREP
PROE


Pacific Island Biodiversity, Ecos
and Climate Change Adaptatio
Building on Nature's Resilienc


Lami Town
Central Business District
N
1 mi
1 km
Protect river banks
Dredge rivers
River realignment
Increase drainage
Existing sea walls/ hard protection
Build sea walls
Replant stream buffer
Existing mangroves
Replant mangroves
Waterways
Main Road
Lami Town Boundary


Village without adaptation
Most vulnerable to climate change impacts
No management of ecosystem services
Village with hard engineering adaptation options
Effective in reducing potential damage
No management of ecosystem services
Village with ecosystem based adaptation (EbA)
Natural buffers reduce climate change impacts
With secondary benefits from ecosystem services
UPSLOPE
Deforestation:
- causes greater landslide risk & higher flood levels
- results in biodiversity loss
RIVERSIDE
Removal of riverside vegetation:
- causes reduced freshwater quality
- increases flooding risk
COASTAL
Removal of coastal vegetation & mangroves:
- causes erosion & coastal flooding
- degrades fish & crustacean habitat
MARINE
Inappropriate watershed management:
- reduces water quality
- degrades health of fisheries and reefs
Improved drainage:
- reduces landslide risk & groundwater recharge
- but can increase sediment flows to rivers and reefs
Artificial banks, dredging & river realignment:
- reduces flooding risk
- but can cause poor freshwater quality & loss of biodiversity
Seawalls:
- reduce erosion in targeted areas
- but can cause erosion nearby & reduce fish & crustacean habitat
- heavy building material can be projected inland by tsunamis & storm surges
Increased aquaculture & access to fisheries technology:
- supplements declining fisheries
Intact & replanted forests:
- reduce landslide risk & less sediment flow to rivers & reefs
- provide building material, crops & firewood & store carbon
Intact & replanted riverside vegetation:
- reduces sediment flows & flooding risk
- protects freshwater supply & biodiversity
Intact & replanted coastal vegetation & mangroves:
- reduce coastal erosion & flooding
- provide building material, crops, firewood & store carbon
Integrated ridge to reef management:
- protects intact habitats & biodiversity
- supports healthy fisheries & reefs
Original illustrations: Sevaloni Tora Symbiotic: Courtesy of the Integration and Application Network University of Maryland Center for Environmental Science (ian.umces.edu/symbiotic)

Understand the Options




HITACHI

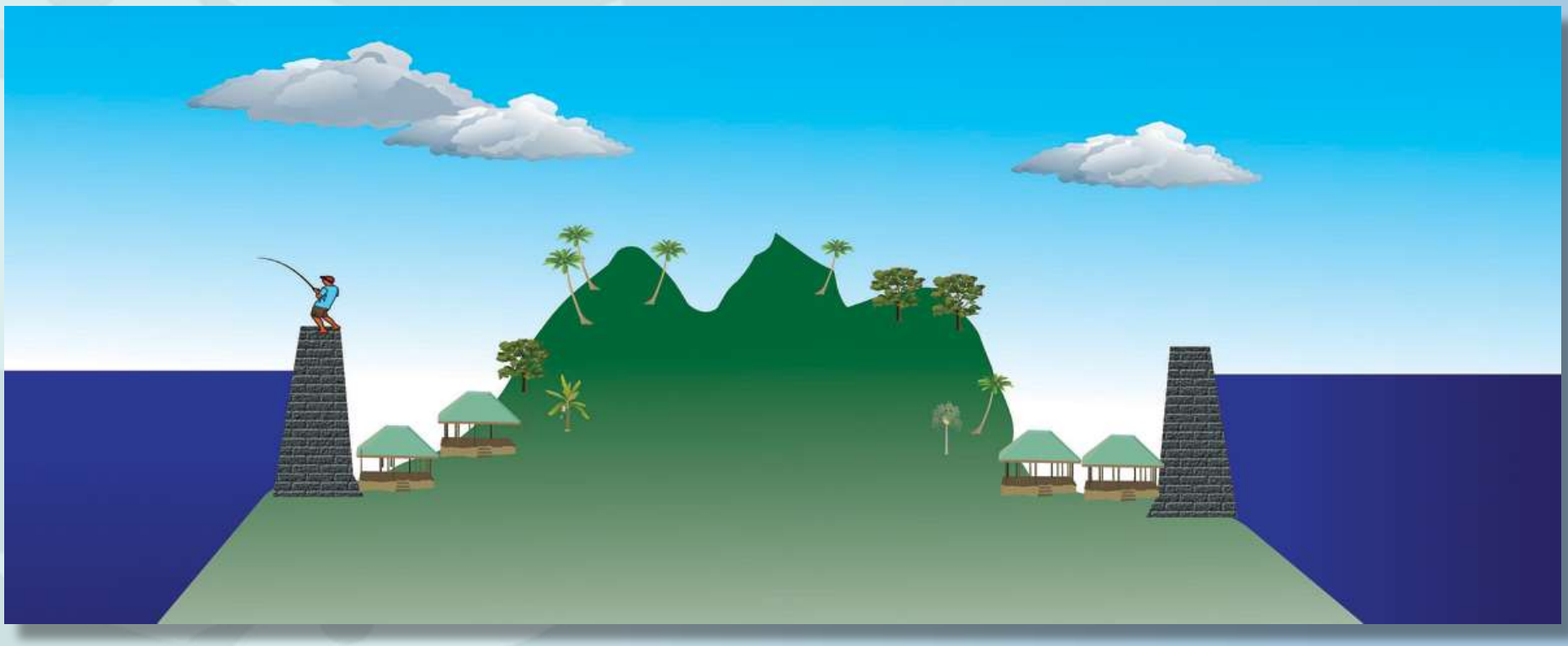







Location of "seawall" boulders after 2009 Tsunami
Key
Boulders
Cubic meters
0.0 - 0.1
0.2
0.3 - 0.4
0.5 - 0.6
0.7 - 0.9

A long term plan?



Increasing Recognition of Need for Ecosystem Approach

Maldives

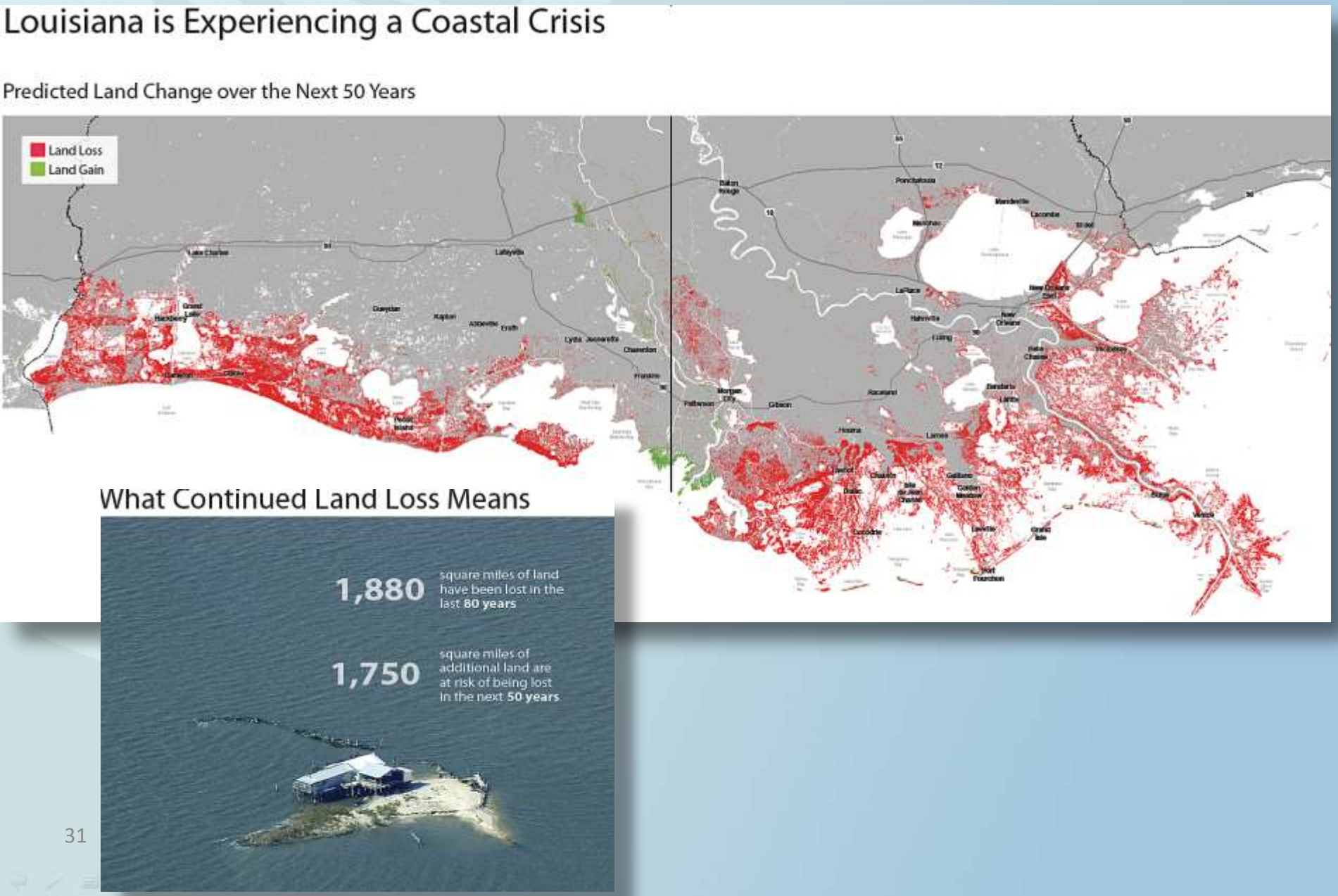




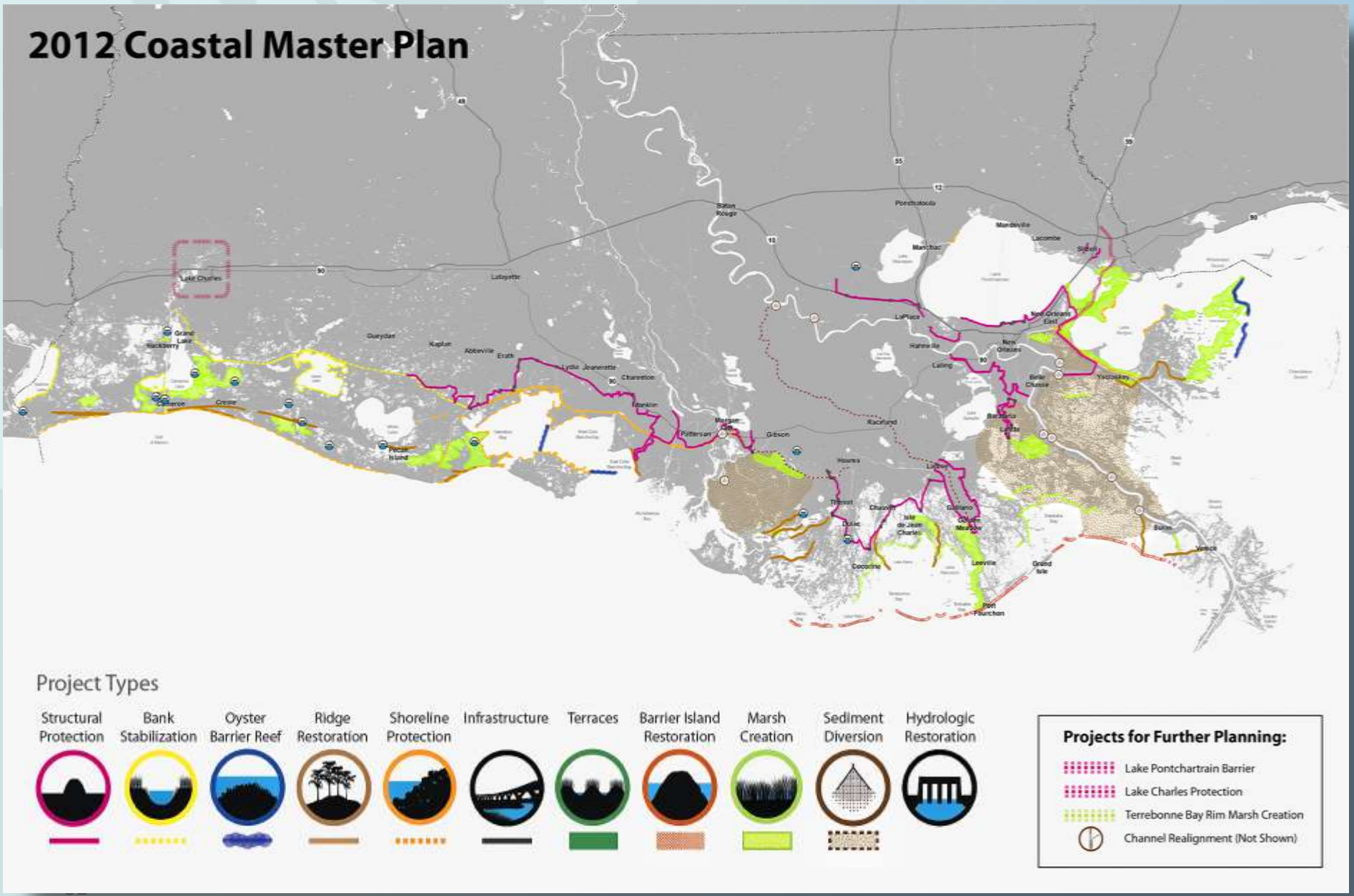
- Change to using ecosystems to improve resilience - cheaper, environmentally more sound, and longer lasting than capital- and technology-intensive counterparts.

- Sea wall around Malé cost $54 million, or $12.4 million per km. Maldives has 2,002 km coastline – seawall $24.8 billion enterprise. With current annual GDP, it would take more than three decades to raise the funds

Louisiana, USA

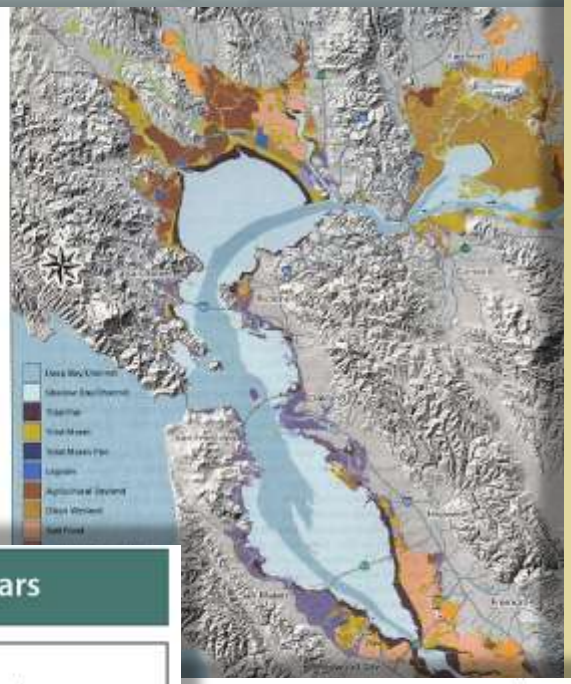


Louisiana, USA



San Francisco Bay, USA

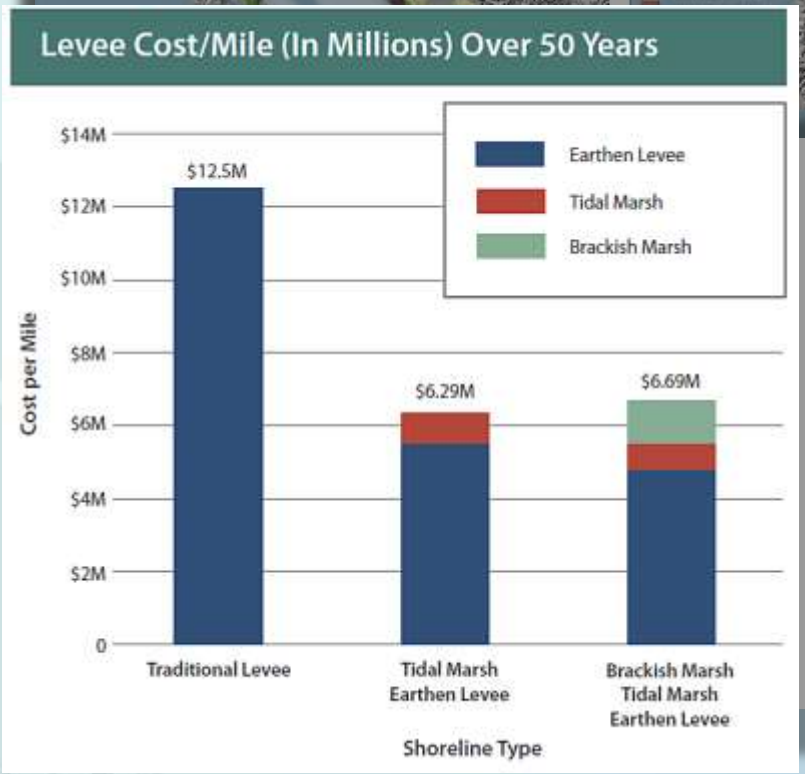


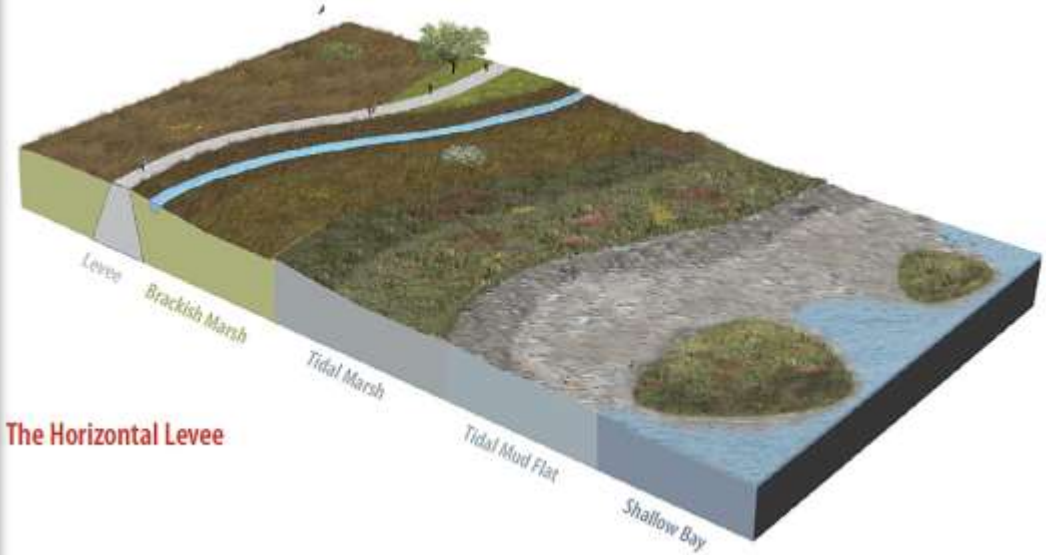


SAN FRANCISCO BAY AREA
SHORELINE AREAS
POTENTIALLY EXPOSED
TO SEA LEVEL RISE

Area potentially exposed to an approximate 16-inch sea level rise
Area potentially exposed to an approximate 55-inch sea level rise
No data

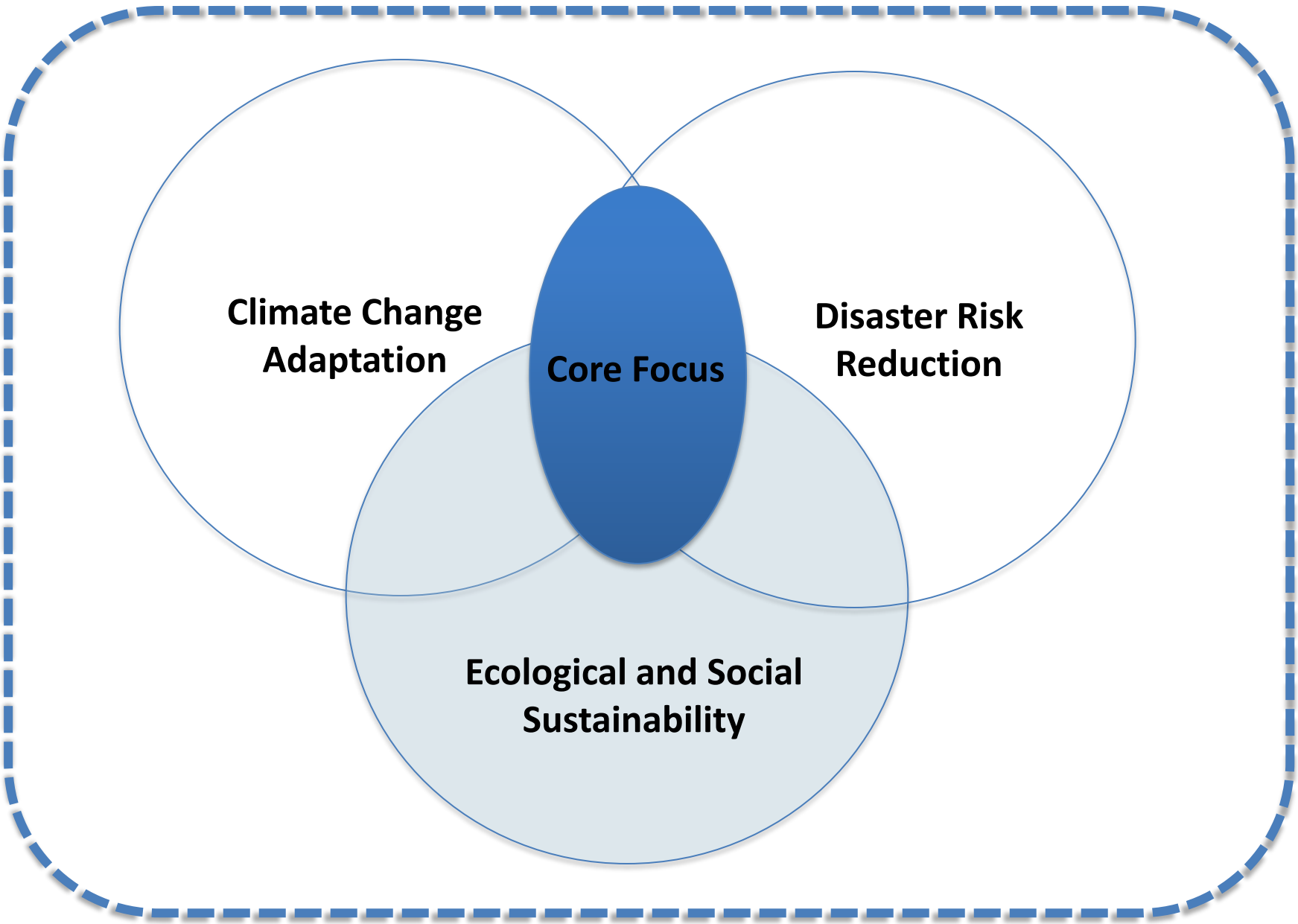






What Needs to Change

- **Integration** of climate change adaptation **options** with the **ecosystem approach**
- **Holistic** – all adaptation options reviewed in the **context of sustainability: livelihoods, ecosystem services protected**
- **Non-climate change issues receive equal** weight in government policy and its implementation
- **Donors** to **fund holistic national level approaches**, **not only community level**
- Funding focus on **developing EbA solutions/models**
- **Governments** need to undertake **national scale long-term development planning** and infrastructure relocation
- **Ecosystem and socio-economic resilience analysis and mapping (ESRAM) completed to integrate CC and non-CC threats into ecological and social vulnerability and opportunity assessments as a basis for adaptation planning at national, provincial and community levels**


ECOSYSTEM APPROACH
Climate Change Adaptation
Disaster Risk Reduction
Core Focus
Ecological and Social Sustainability

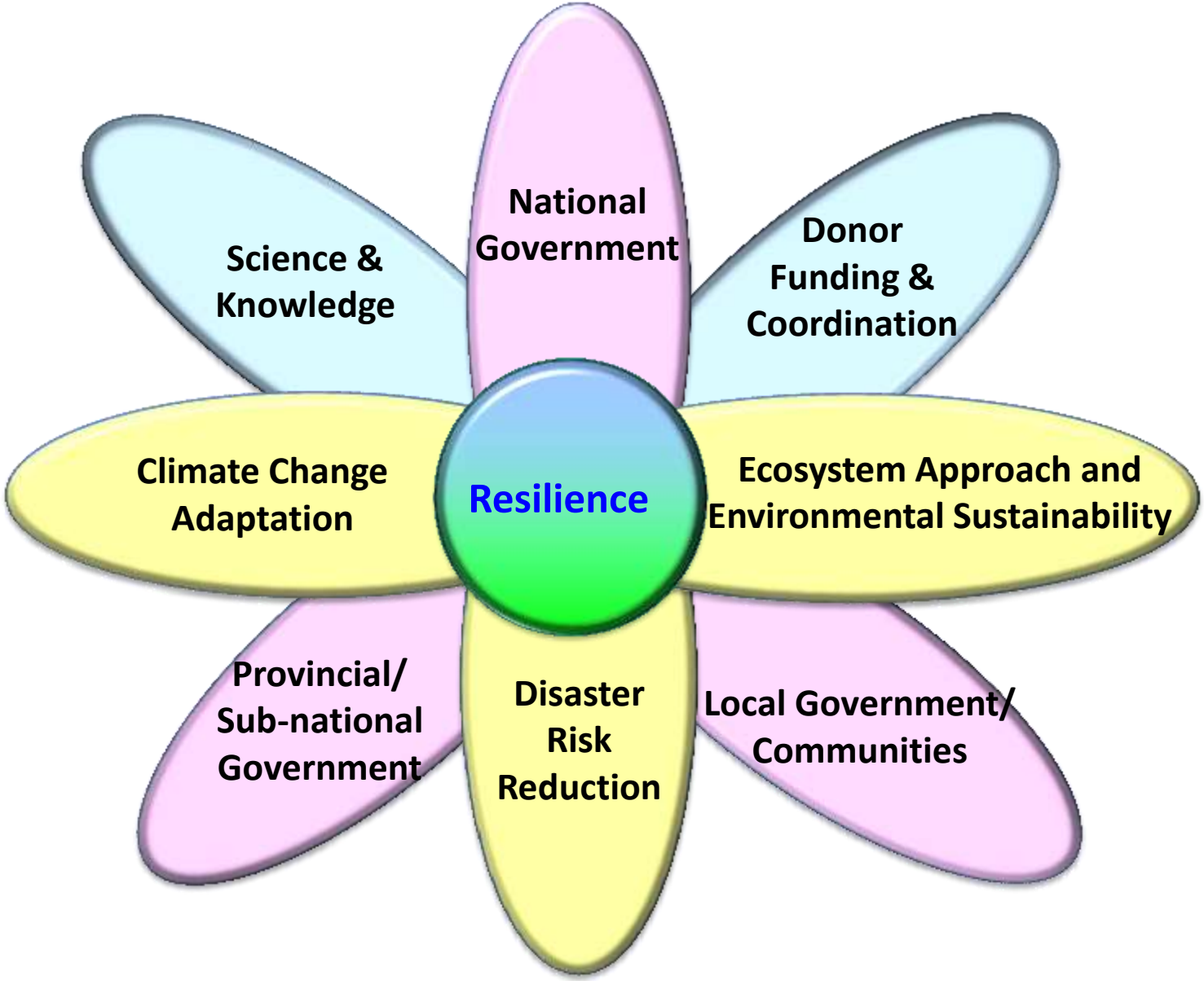
Landscape Scale that includes Community and Ecosystem Focus



National policy implementation ⟷ **Sub-national policy implementation** ⟷ **Community engagement**

Country-wide integrated planning

Whole-of-island integrated planning, ridge to reef approach, watershed management, etc


National Government
Donor Funding & Coordination
Ecosystem Approach and Environmental Sustainability
Local Government/ Communities
Disaster Risk Reduction
Provincial/ Sub-national Government
Climate Change Adaptation
Science & Knowledge
Resilience

Thanks

