Financial Sustainability for the recovery and resilience of the Mesoamerican Reef

_Innovative financial mechanisms to manage risk and build resilience in reef systems and their dependent populations_

CCAD-MAR Regional Strategic Workshop

23 November 2021
What role do risk financing and insurance play in supporting ecosystems?

**Benefits**
- Natural assets can provide critical ecosystem services and benefits to biodiversity, industries such as tourism and fishing, and risk reduction to coastal communities

**Risk**
- Natural assets and investments in them are vulnerable to natural hazards and human impacts

**Protection**
- Risk financing can provide coverage to ecosystems as natural capital assets themselves, to investments in ecosystems and their conservation, and can support community climate adaptation while incentivising environmental stewardship

**The role of insurance**
- Insurance is only a part of the solution, but it can provide wider co-benefits – such as financial inclusion and supporting climate resilience in communities and unlocking additional investments in natural assets
- Insurance-related methodologies, such as quantitative risk assessment, develop risk awareness and understanding, which can be used to inform evidence-based decision making
- Parametric insurance in particular provides rapid liquidity after an event to facilitate immediate response and recovery
- Risk transfer creates incentives to mitigate risks by generating greater risk awareness and recognising the real financial consequences of risk
MAR Insurance Programme: Introduction
A practical example of putting in place insurance protection for ecosystems

An insurance solution, providing cost-effective cover for hurricane risk to the MAR, will complement and support the holistic strategy of the RRI and the sustainability of the Emergency Fund

Who pays and who is the policyholder?
1. Coverage executed and premium paid

What is covered?
2. Qualifying cyclone event occurs

How much is needed?
3. Insurance pay-out made based on parametric index

Who receives the pay-out and how is it managed and distributed?
4. MAR Fund receives and distributes the pay-out through the Emergency Fund

How is the pay-out implemented?
5. Emergency Response Group A
5. Emergency Response Group X

Who is the policyholder?
What is covered?
How much is needed?
Who receives the pay-out and how is it managed and distributed?
How is the pay-out implemented?
What is parametric insurance?

**Parametric insurance**

- A risk financing instrument that pays out a pre-agreed amount to a policyholder according to pre-defined event characteristics (e.g., wind speed)
- The pre-defined event characteristics are selected such that they effectively proxy loss, damage, or impact
- Thresholds are set to “trigger” pay-outs if pre-agreed event parameters are met

**Indemnity**
- An item has an agreed value and suffers a loss

- The loss is assessed after the event and payment or repair is made to compensate the loss

**Parametric**
- Parametric insurance features a parametric trigger

- Thus a predetermined trigger based on a physical feature of an event defines when the contract is to pay out without any adjustment for the actual loss suffered, hence limiting basis risk is a key consideration of product design
Determining the optimal product design

Current sweet spot for reef insurance

Pure parametric
- Pay-outs based on event intensity in a covered geography
- Very simple and easy to understand, often with large basis risk

Gridded parametric
- Pay-outs based on the spatial distribution of event intensity across a covered geography
- Good to account for mixed impacts, as relationship between event intensity and pay-out is flexible

Parametric index
- Pay-outs based on the spatial distribution of the impacts of event intensity across a covered geography
- Good for covers where there is a robust relationship between event intensity (i.e., hazard parameters) and detailed impacts (i.e., losses / costs)

Modelled loss
- Pay-outs based on estimated loss from a catastrophe model
- Good to cover homogeneous fixed assets where there is a scientifically robust relationship between hazard parameters and physical damage (e.g., property)
Determining the optimal product design

## Payout Rate

<table>
<thead>
<tr>
<th>Hurricane Category</th>
<th>C100</th>
<th>C75</th>
<th>C50</th>
<th>Core</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
</tr>
<tr>
<td>1</td>
<td>0%</td>
<td>5%</td>
<td>5%</td>
<td>10%</td>
</tr>
<tr>
<td>2</td>
<td>0%</td>
<td>5%</td>
<td>10%</td>
<td>20%</td>
</tr>
<tr>
<td>3</td>
<td>5%</td>
<td>10%</td>
<td>20%</td>
<td>40%</td>
</tr>
<tr>
<td>4</td>
<td>10%</td>
<td>20%</td>
<td>40%</td>
<td>80%</td>
</tr>
<tr>
<td>5</td>
<td>20%</td>
<td>40%</td>
<td>80%</td>
<td>100%</td>
</tr>
</tbody>
</table>

*The execution of this Agreement shall not have any effect with respect to, or in connection with, any sovereignty claims over any territory (land, insular and maritime) claimed by the Republic of Guatemala and/or Belize; nor shall it have any effect over the rights and/or claims of either country over such territory.*
Programme options

An insurance programme is how products are distributed and administered and how the underlying risk in those products is aggregated and funded.

How are pay-outs rapidly, efficiently implemented for reef response, leveraging regional, national, and local capacity?

- Coherent regional pay-out governance and distribution processes, linked to on-the-ground reef response groups
- Separate pay-out governance and distribution processes at the national or individual reef site level

What are the risk pooling options?

- Single policy for all reef sites
- Separate policies per county
- Separate policies per reef site
- Separate / multiple policies for individual reef beneficiaries

Who is/are the policyholder(s)?

- MAR Fund
- Governments
- Reef managers
- Reef beneficiaries
### Programme options: Benefits of risk pooling

<table>
<thead>
<tr>
<th>Key benefits of pooling the risk of multiple reef sites under a single policy</th>
<th>Minimise insurance cost by reducing annual volatility in pay-outs, which reduces the amount of capital risk-takers need to allocate to cover the extreme years which, in turn, reduces the premium price</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Minimise frictional costs with a single insurance policy placement and administration process</td>
</tr>
<tr>
<td></td>
<td>Maximise operational efficiency with a coherent regional pay-out governance and distribution process, which increases the predictability of post-event response funding and incentivises more robust contingency planning</td>
</tr>
<tr>
<td></td>
<td>Streamline implementation of reef response by maximising collaborative action and peer learning, contributing to stronger regional conservation outcomes</td>
</tr>
<tr>
<td></td>
<td>Enable a regional premium financing strategy that recognises the MAR as a global public good</td>
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</table>
Beyond Hurricanes: Exploring the possibilities for coral reef insurance

- We recently worked with The Nature Conservancy to assess the feasibility of insuring coral reefs from a range of hazards in Florida and Hawaii, including:

<table>
<thead>
<tr>
<th>Insurable</th>
<th>Uninsurable</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hurricanes (wind speed)</td>
<td>Coastal construction, overfishing, wastewater discharge, damage from diving etc</td>
</tr>
<tr>
<td>Marine heatwaves and cold-water abnormalities (SST)</td>
<td>Oil spills and ship grounding</td>
</tr>
<tr>
<td>Stormwater runoff (precipitation)</td>
<td>Coral disease</td>
</tr>
<tr>
<td>Tsunami (wave height)</td>
<td>Ocean acidification</td>
</tr>
</tbody>
</table>

- In the study, potential ways of funding insurance premiums were also explored: for example, vessel registration fees, a coral reef protection act, tourist development taxes, local government taxes, and an interlocal entity.
Beyond Reefs: Protection for business model of Marine Managed Area (MMA)
Building the resilience of blue businesses, with applications across the blue economy

- Fill a hole in revenue from user fees if a major hurricane impacts significantly on tourism arrivals
  - Experience from the Caribbean demonstrates that impacts on tourism can be very significant (e.g., Granvorka & Strobl, 2013; Hurricane Maria in Puerto Rico in 2017)
- MMA user-fees are particularly vulnerable to hurricane impacts, as storm conditions may impact marine activities more heavily than net tourism
  - Fill a hole in revenue from user fees if a major hurricane impacts significantly on the ecosystem services provided by the MMA so that visitors are not willing to pay fees to dive or visit offshore areas by boat
  - Provide additional financing required for rapid reef clean up, protecting conservation outcomes
  - Provide financing to cover additional medium-to-long-term conservation efforts required as a result of hurricane impacts
  - Cover physical damage or destruction of capital assets such as boats, docks, buoys etc.

This is a “cat-in-a-box” coverage design, with three trigger levels providing for progressively larger payments as event intensity, and thus overall impact, increases.

<table>
<thead>
<tr>
<th>Hurricane Category</th>
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<tbody>
<tr>
<td>TS - Cat 2</td>
</tr>
<tr>
<td>Cat 3</td>
</tr>
<tr>
<td>Cat 4</td>
</tr>
<tr>
<td>Cat 5</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Category</th>
<th>Trigger Rate (% of Limit)</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>25%</td>
</tr>
<tr>
<td>4</td>
<td>50%</td>
</tr>
<tr>
<td>5</td>
<td>100%</td>
</tr>
</tbody>
</table>

The highest category which a storm reaches within the purple box would be used to evaluate the trigger level for that storm.