



*The Resilience Performance Assessment (RPA) tool, an innovative solution to measure the balance between adaptation and mitigation investments for infrastructures and territories*

7th December. 15h35 – 16h

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RESALLIANCE  
by  sixense



## At stake : a need for climate change resilience

- Cities and infrastructures are facing **shocks** and **stresses** due to climate change
- Adaptation will cost **\$80 to \$100 Bn per year** and will be borne by urban areas



Shifts in our climate bring potentially

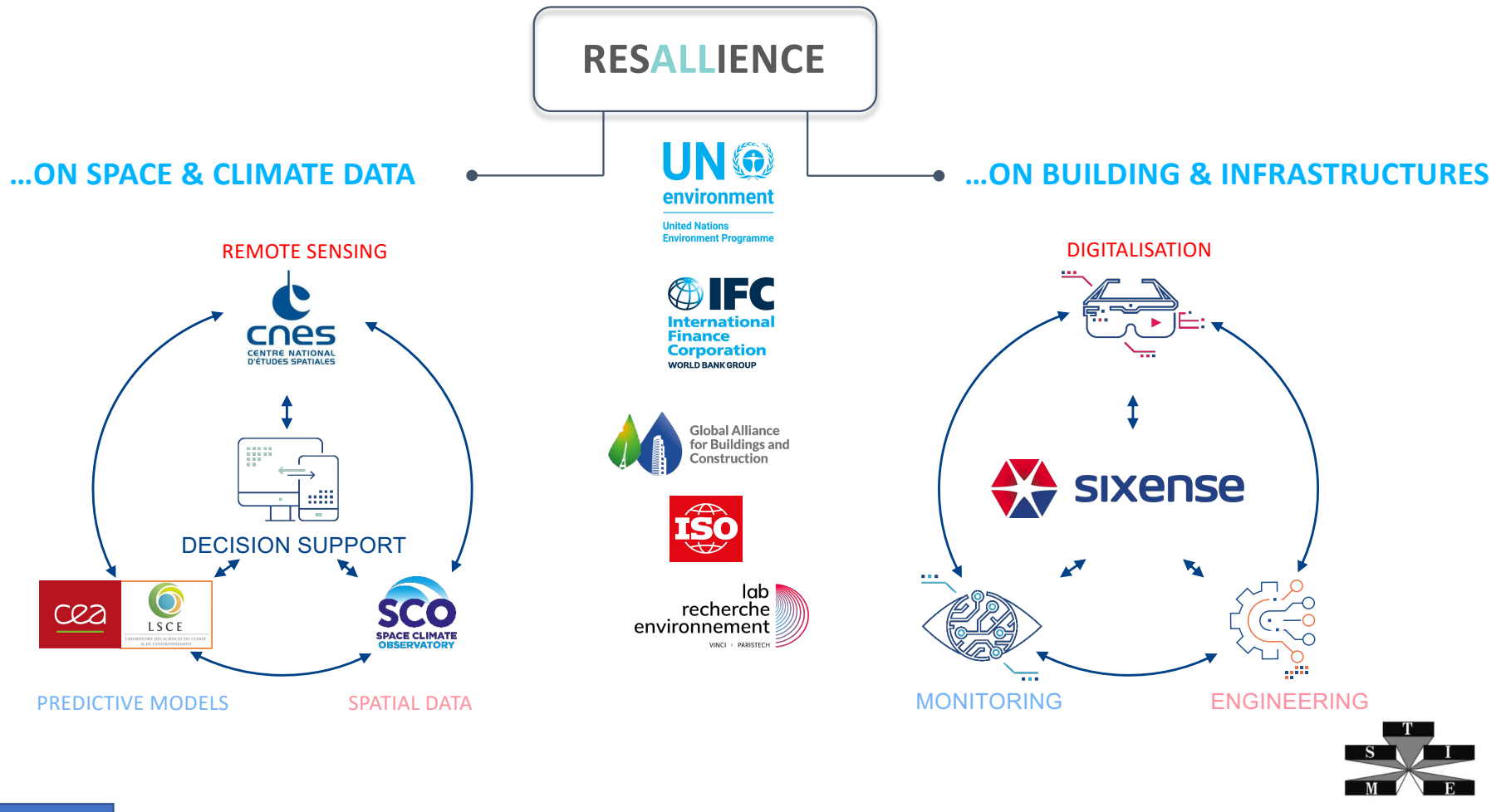
“profound implications for insurers, financial stability and the economy”

**X4 cost of climate change (2015-2017 & 2016-2018 & 2018 2020)**

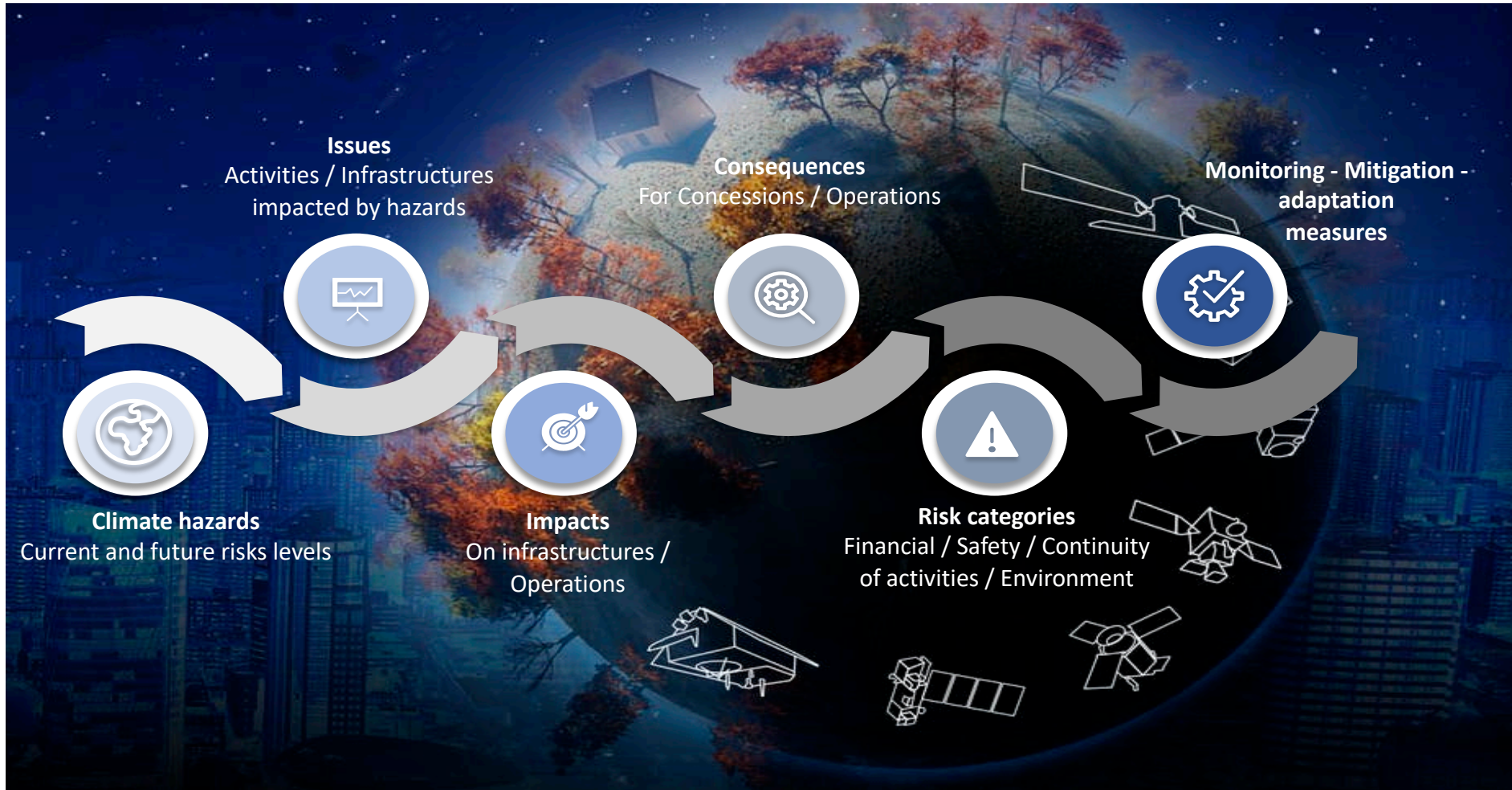
Source: [World Bank](#), 2016



# RESALLIANCE, a design office dedicated to climate change adaptation



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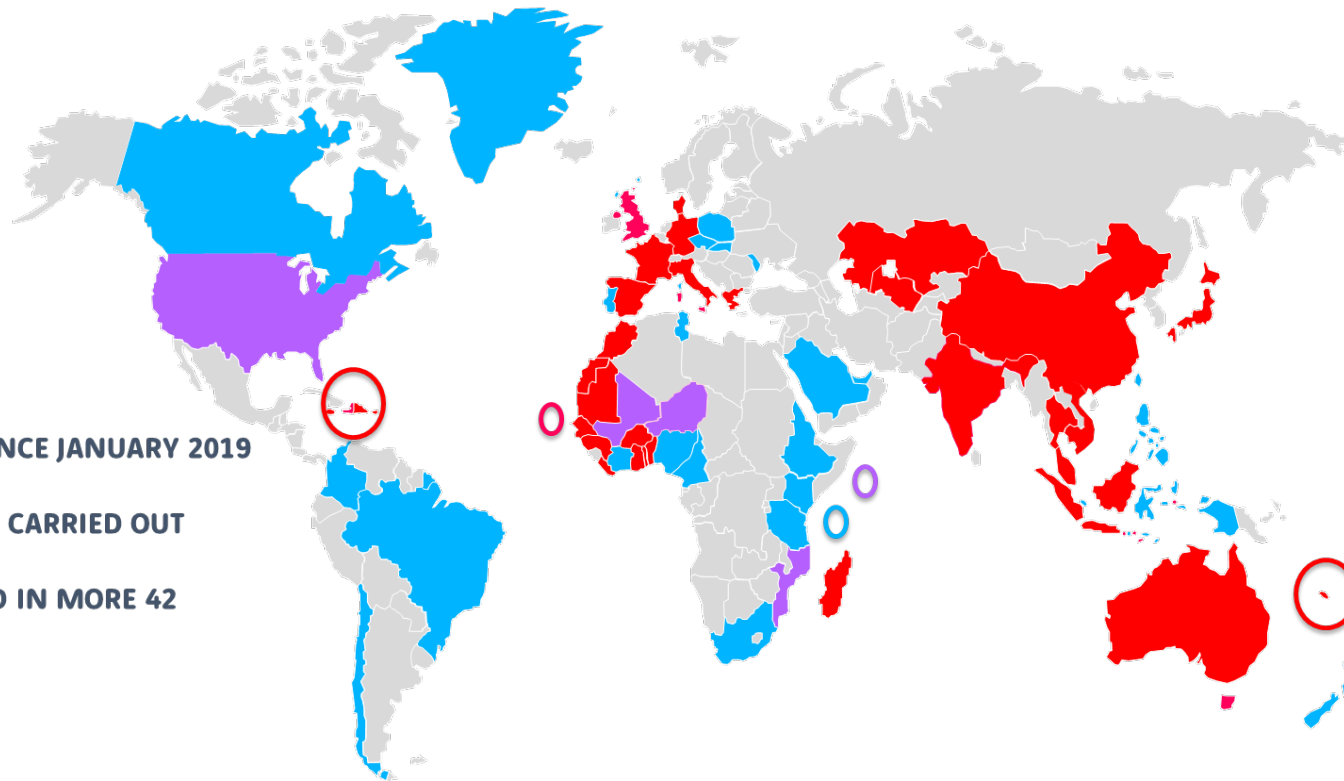


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## LOCATION OF PROJECTS REALIZED, IN PROGRESS, FUTURE & UNDER DEVELOPMENT



### KEY FIGURES SINCE JANUARY 2019

- 65 PROJECTS CARRIED OUT
- DISTRIBUTED IN MORE 42 COUNTRIES



# Towards a reduction of physical and functional vulnerabilities



Dominica, after Hurricane Maria (2017) : 80% of buildings were damaged.





## A need to anticipate and prioritize CAPEX/OPEX



### A need to adapt in a holistic way:

- **Ensure security of citizens, workers and users**
- **Evaluate assets at risk:** climate hazard forecast and vulnerability analysis
- **Service continuity:** administrative, water supply, sanitation network, telecommunications, risk management, transports and logistics
- **Supply in products and essential materials** (food, construction, health etc.)
- **Maintenance of infrastructures**



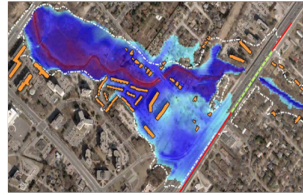
### How to balance between investing and inaction ?

- **Evaluate assets at risk:** climate hazard forecast and vulnerability analysis
- **Which impacts on activities for which certitude ?**
- **Which depreciation for which efficiency** at short, medium and long term ?
- **Which adaptation solutions** in terms of processes and service continuity ?
- **Which benefits and amenities** for territories ?



# The RPA, a solution to support adaptation and mitigation strategies

Valorization of spatial data  
Climate change impacts modeling  
Warning system design

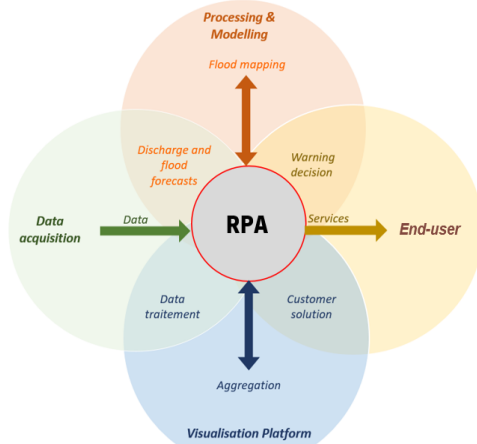


Processing & Modeling

Investment costs calculation vs cost of inaction  
Efficiency and rentability calculation  
More virtuous economic strategies planning  
Anticipation with a multi-risk warning system



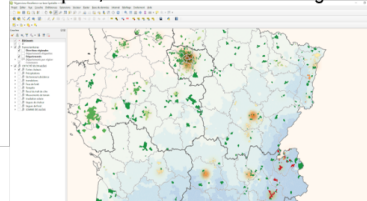
Use of spatial data



CAPEX/OPEX and investments rentability calculation

Climate change current and future impacts mappings  
Infrastructures action planning in their territorial context

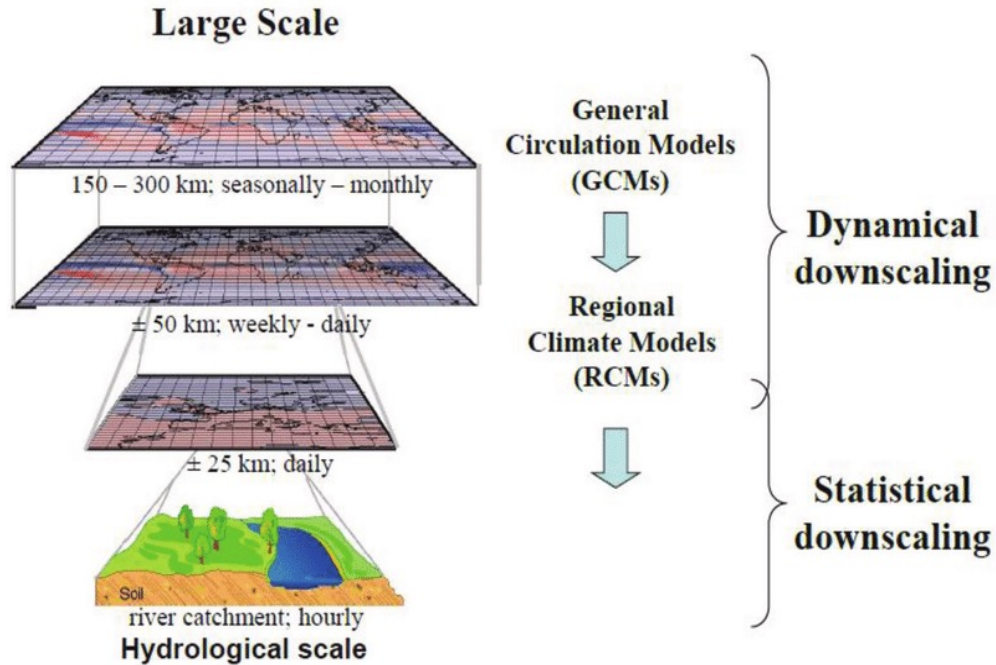
A hypervisor to pilot, communicate and strengthen capacities



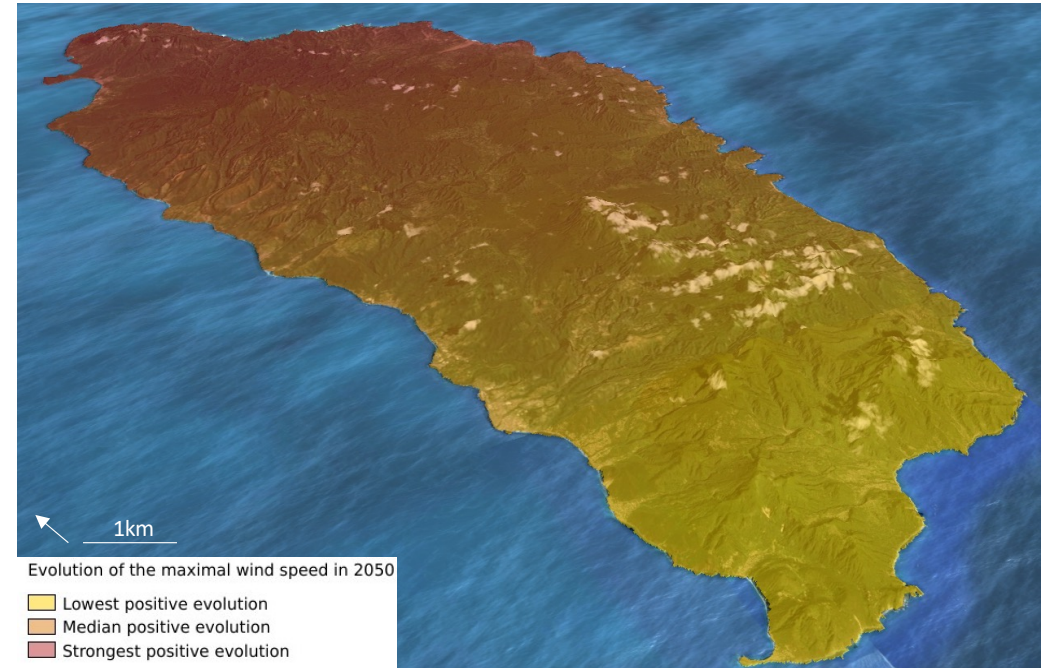
Transport and logistic stream optimisation  
Process adaptability  
Capacity building



# A GIS-based tool to visualize climate change hazard exposure



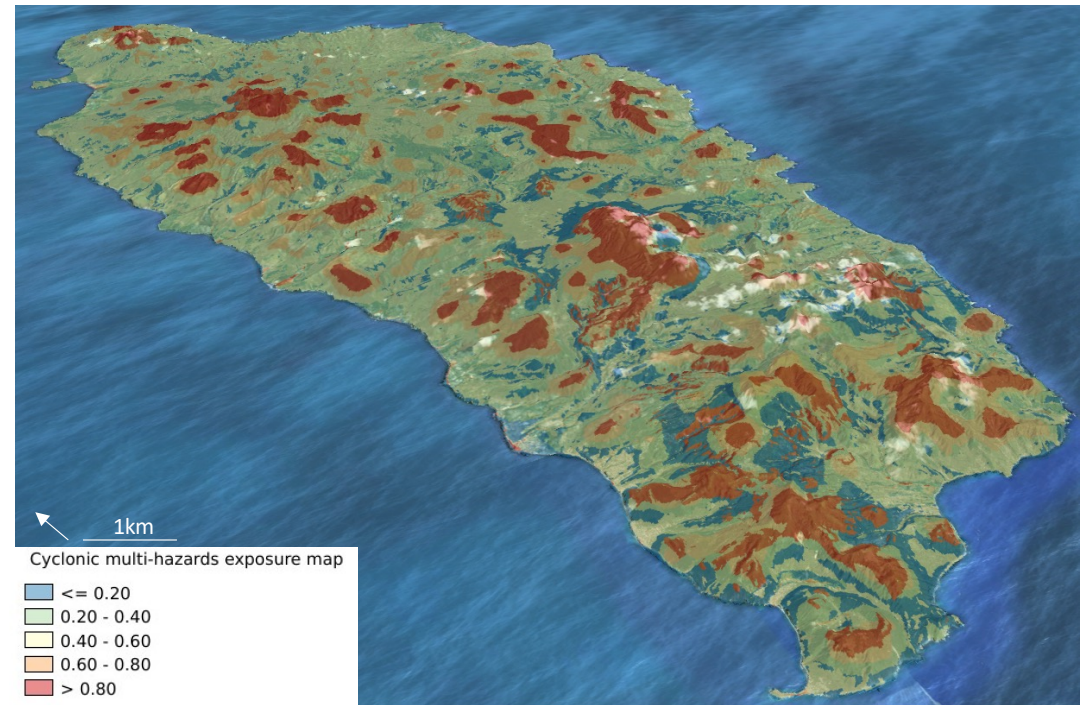
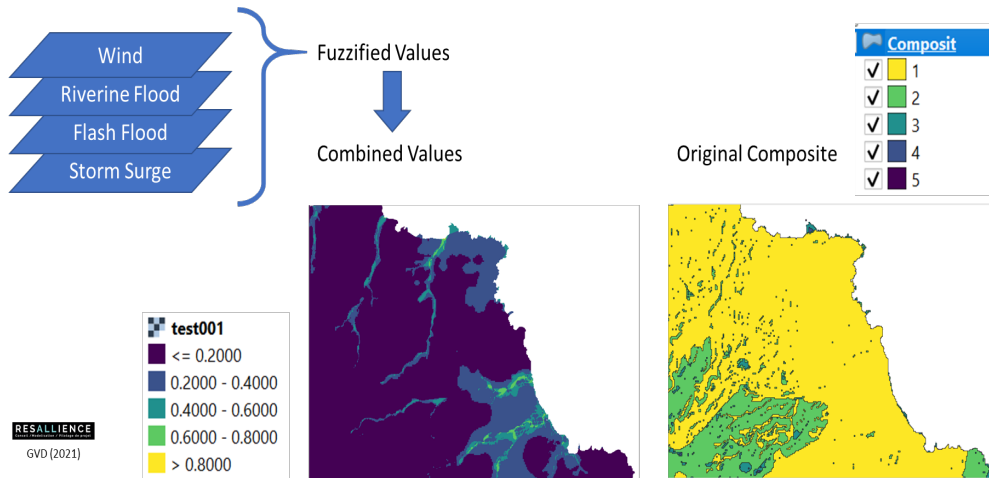
Adapted from Willems, 2011 in Siwila et al., 2013



## 2. Methodology

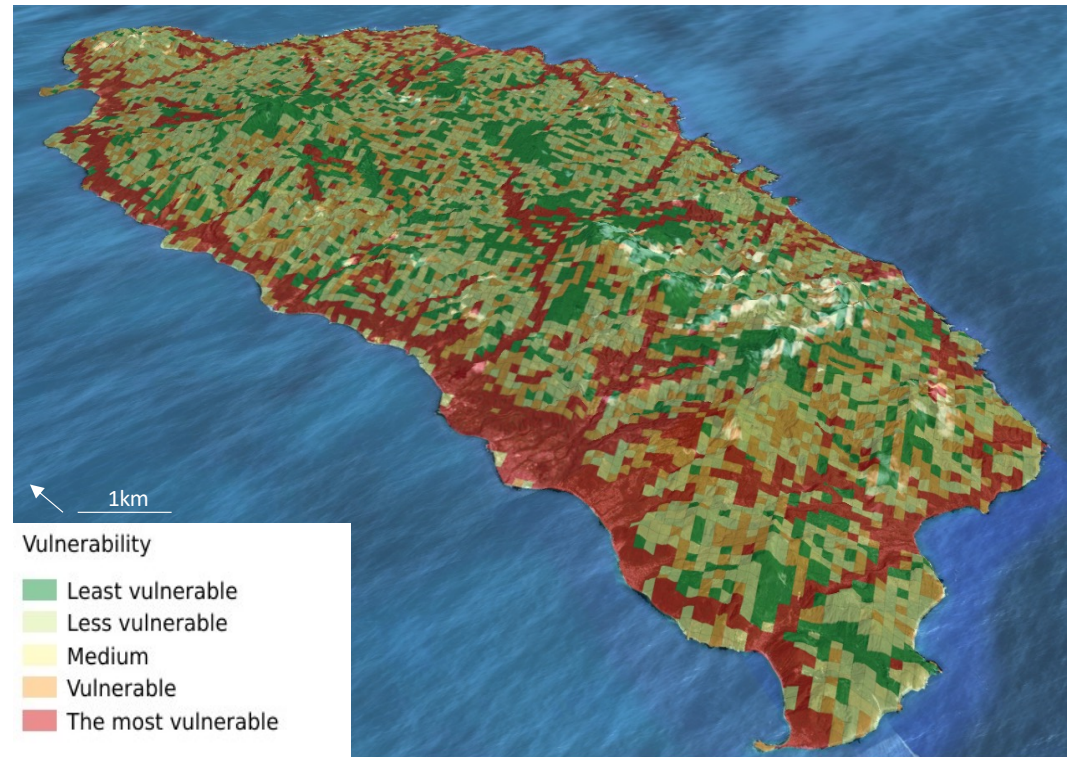


# A GIS-based tool to spatialize complex risks impacts



## A GIS-based tool to assess territorial vulnerabilities

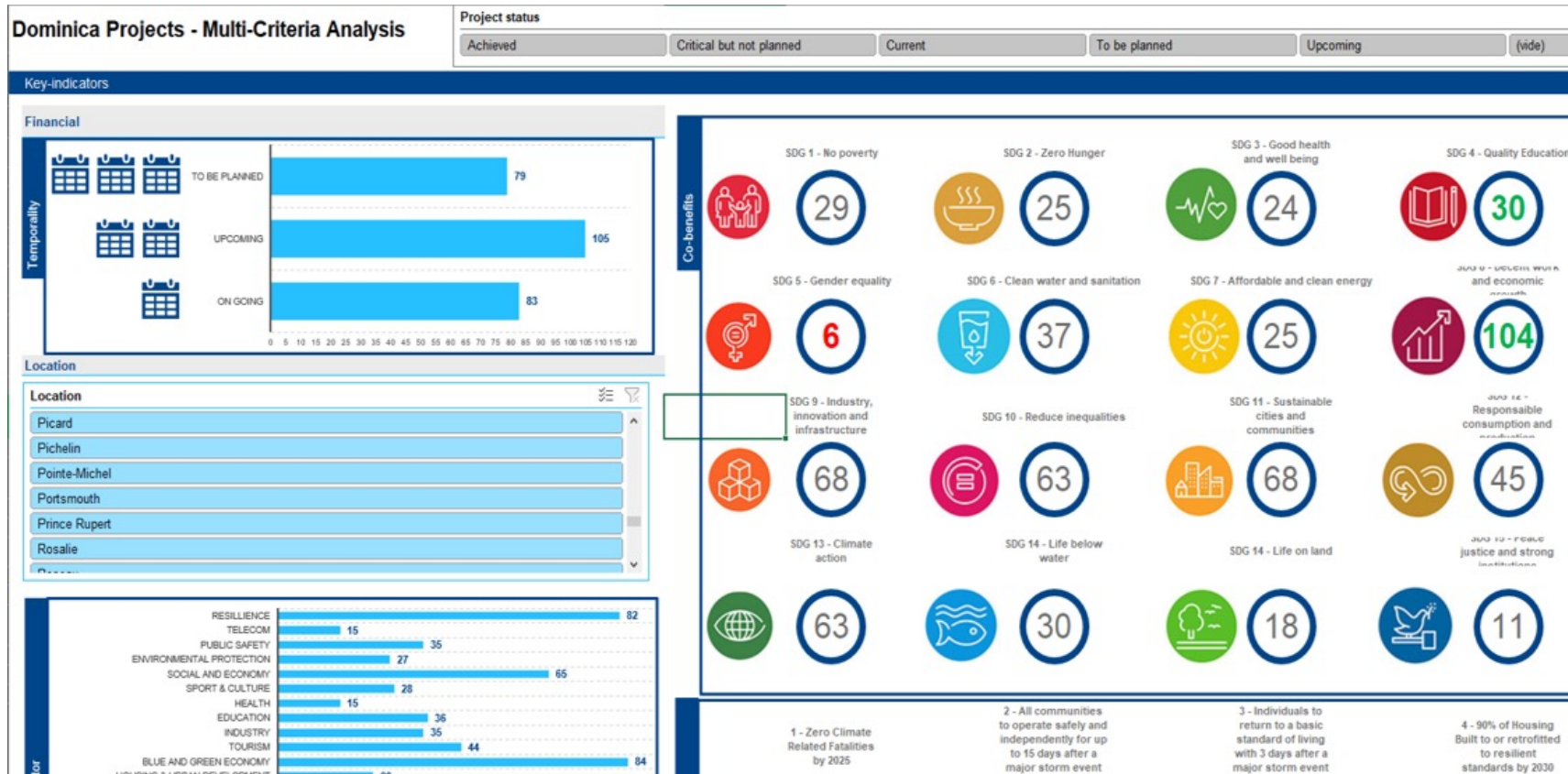
Aggravation/ mitigation	System	Asset
↗	Residential buildings	Residential buildings
↗	Economic buildings	Economic buildings
		Tourist sites
		Quarry locations
↘	Health buildings	Hospitals
	Administrative buildings	Administrative and services buildings
	Emergency buildings	Emergency shelters
↗	Transport infrastructures	Major and secondary roads
		Airports
↗	Networks	Water supply and sanitation networks
		Electricity network
		Telecommunications



Principal Component Analysis (PCA) based quantification of the vulnerability



# An analytical dashboard to prioritize adaptation and mitigation strategies



## Conclusion : The RPA, an innovative solution

- An innovative solution composed of **two operational tools : a GIS and an analytical dashboard** for **infrastructures, buildings and territories**
- The RPA addresses **climate change adaptation & mitigation** issues in **investment policy statements**
- The RPA can be a support for:
  - **Applying** climate change adaptation & mitigation **tools, metrics and analyses**
  - **Integrating** climate change adaptation & mitigation **factors into evolving research and analysis**
  - **Advocating** climate change adaptation & mitigation **training for investment professionals**



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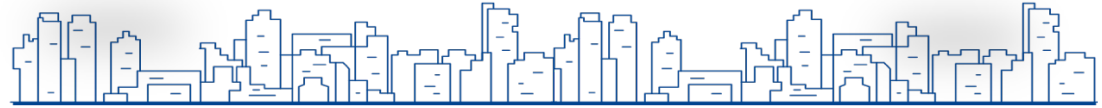
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