



# **A SUSTAINABLE AND REPLICABLE MODEL FOR HIGH-COMPLEXITY TERRITORIES**

**LESSONS FROM SUMAPAZ AND THE CIENAGA FOR NRENS WORLDWIDE**

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# CAN DIGITAL RESILIENCE EXIST IN EXTREME ECOSYSTEMS?



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## High-Mountain Infrastructure

### **Water regulation**

Supplies and stabilizes water systems for Bogotá and the Andean region.

### **Carbon capture**

One of the most efficient natural carbon sinks on the planet.

### **Endemic biodiversity**

Home to unique species such as frailejones.

## Aquatic & Cultural Infrastructure

### **Living communities**

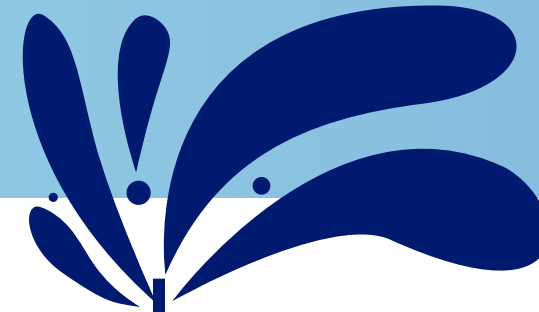
Palafitic cultures entirely dependent on ecosystem stability.

### **Hydrological balance**

Extremely sensitive water-land equilibrium.

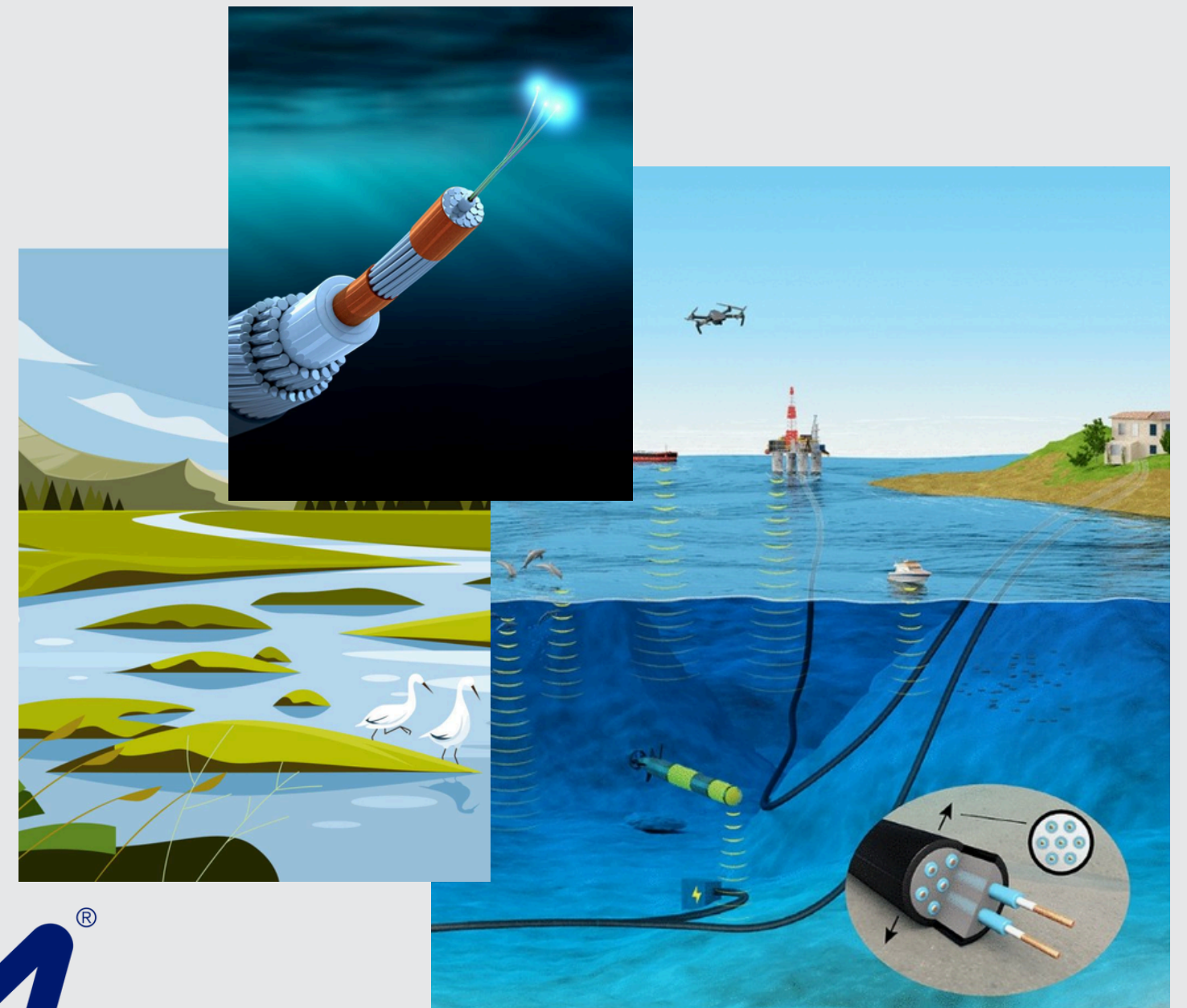
### **Ramsar wetland**

Internationally protected ecosystem of global importance.

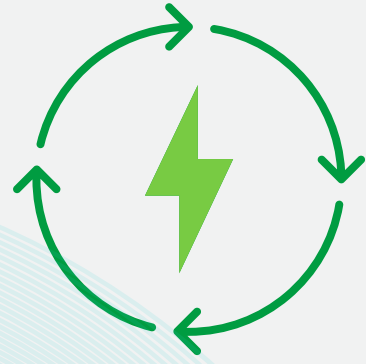


# MOST PROJECTS FAIL BY COPYING URBAN MODELS.

This is not a technology problem.  
It is a contextual design problem.



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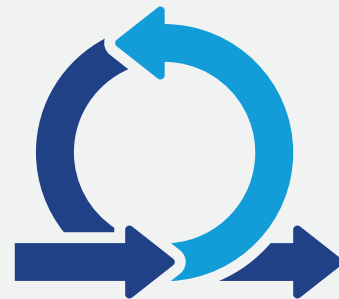
**Sustainable energy**



**Community & ecosystem**

**DIGITAL RESILIENCE IS A SYSTEM, NOT A TOOL**

**Agile methodologies**



**Academic knowledge**



# SUMAPAZ: TECHNOLOGY DESIGNED FOR COLD

Innovation is adaptation, not imposition.



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# CIÉNAGA: WHEN WATER IS THE CHALLENGE

CONNECTING WITHOUT BREAKING THE ECOSYSTEM.



# THE METHODOLOGY (THE REAL VALUE)

This was a project — now, it is a replicable model

- Agile project management.
- ICT implementation frameworks.
- Scientific conservation principles.
- Universities, professors, and students in the field.



## **WHY THIS MATTERS TO NRENS:**

These challenges are already global.

Remote territories.

Strict environmental regulation.

Limited resources.

High social complexity.

# DIGITAL SISU

RESILIENCE IS ALSO CULTURAL

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# THE CALL:

No one can solve this alone.

**Europe advanced by sharing capabilities.**

**Latin America and the Global South must do the same.**

**Sharing methodologies matters more than competing for projects.**



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**Digital resilience in extreme ecosystems is only possible when agile methodologies, academic knowledge, and sustainable technologies operate as a single adaptive system.**

