

# Singapore Symposium on Microgrids

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Mendoza, Rodrigo Palma

November 2022



# Overview of micro-grids in Latin America



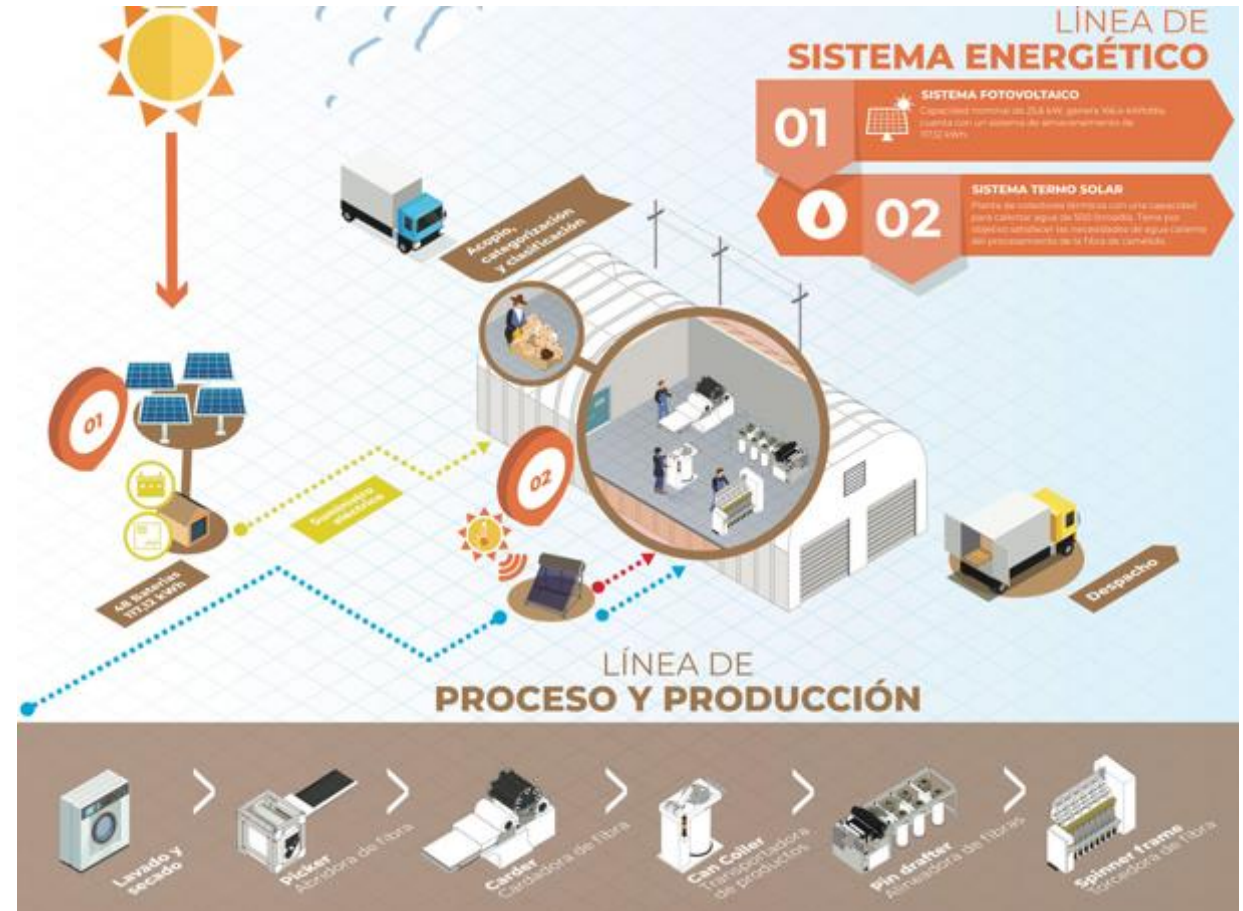
# Chile: Ayllu Solar



# Chile: Ayllu Solar (Visviri)

## Solar energy for a camelid fiber collection and processing center

This project seeks to generate an opportunity for sustainable development for the inhabitants of General Lagos, through the addition of value to the local livestock activity, based on their traditional knowledge, making intensive use of solar energy and helping to improve production processes, enhance livestock traditions and their cultural value.

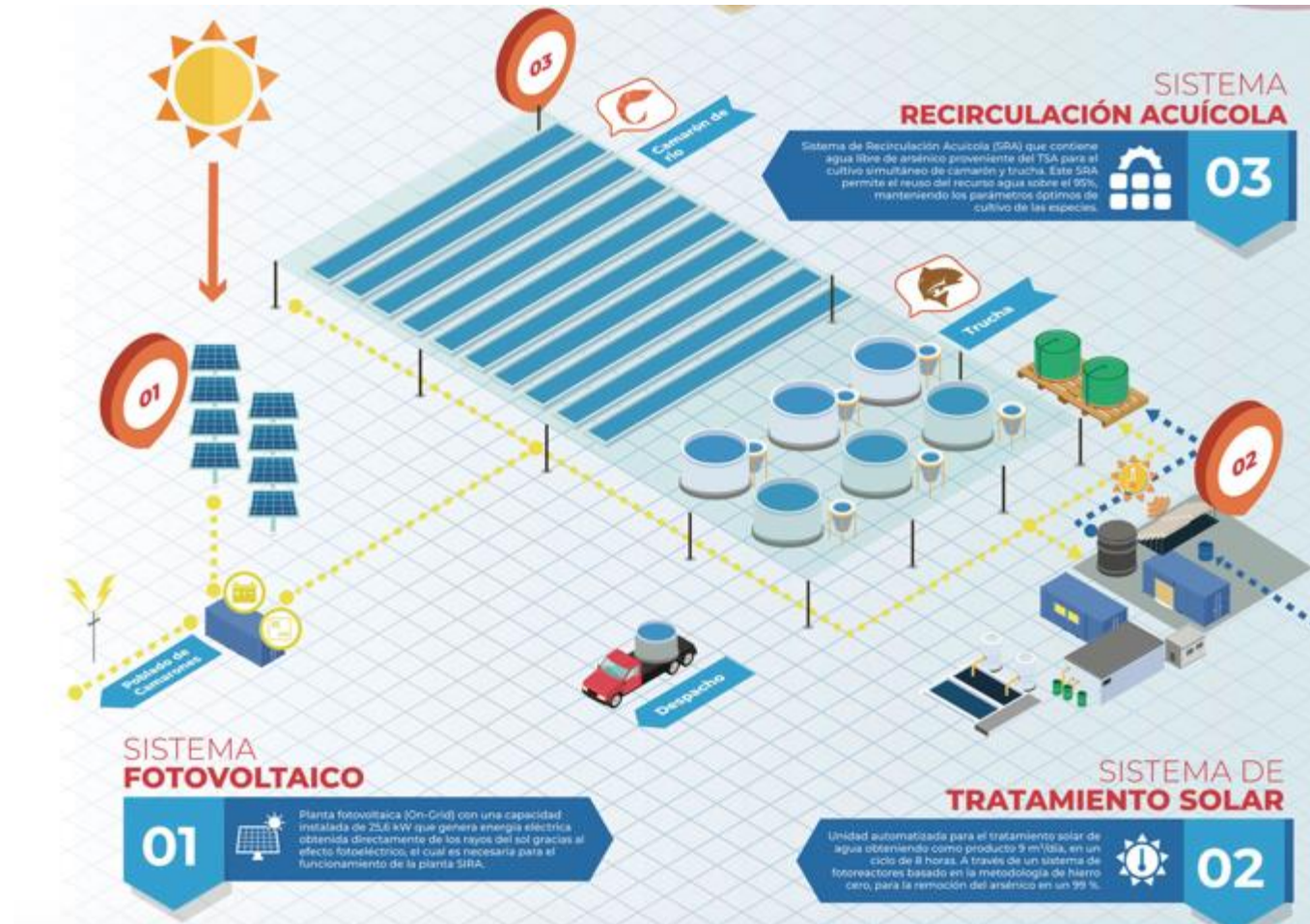




# Chile: Ayllu Solar (Camarones)

## River Shrimp farming through intensive use of solar energy for sustainable development of the town of Camarones

The execution of this project seeks to promote river shrimp and trout farming through intensive use of solar resources. For this, it is necessary to have water of adequate quality for use in aquaculture, based on a technology of low energy consumption that allows the abundant local solar radiation to be used both for energy support and for the photochemical removal of arsenic. In a complementary way, a profitable, scalable and replicable business model will be developed that allows the production of river shrimp and trout in a sustainable way. In this way, promote the socio-economic development of the town of Camarones, Taltape and Maquita, improving the quality of life of its inhabitants



# Cooperation activities and info



Online course: Introduction to Smart microgrids (spanish, portuguese)

PRESENTAN

**CURSO ONLINE INTERNACIONAL**  
Curso gratuito ofrecido en Español y Portugués - subtítulo

**INTRODUCCIÓN A LAS MICORREDES ELÉCTRICAS INTELIGENTES**

RELACIÓN TECNOLOGÍA-COMUNIDAD, DESAFÍOS Y FUTURO DE LAS MICORREDES - CIERRE

16/12/20 - De las 10h a las 13h (UTC -3)

**Guillermo Pielavino** (Argentina)

**Jairo Martínez** (Colombia)

PRESENTAN

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Curso gratuito ofrecido en Español, Portugués e Inglés - subtítulo

**INTRODUCCIÓN A LAS MICORREDES ELÉCTRICAS INTELIGENTES**

CONFERENCIA INAUGURAL

Presentación del Programa CYTED y de la Red MEIHAPER  
Presentación de la Asociación Brasileña de Microrredes  
Presentación del programa del curso  
Introducción a las Microrredes Eléctricas

16/09/20 - De las 10h a las 13h (UTC -3)

**Guillermo O. García** (Argentina)

**Rodrigo B. Otto** (Brasil)

**Eduardo G. Luna** (Colombia)

**Luis H. Callejo** (España)

AUSPICIA: MICORREDES ASOCIACIÓN BRASILEÑA DE MICORREDES

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**INTRODUCCIÓN A LAS MICORREDES ELÉCTRICAS INTELIGENTES**

POLÍTICAS E IMPLEMENTACIÓN DE MICORREDES AISLADAS

Proyecto de Energías Renovables en Mercados Rurales - Argentina  
Implementaciones de Microrredes Aisladas de Muy Baja Potencia - Argentina  
Implementación de Microrredes Aisladas en la Patagonia - Argentina y Chile

23/09/20 - De las 10h a las 13h (UTC -3)

**Pablo Bertinat** (Argentina)

**Guillermo Catuongo** (Argentina)

**Gonzalo Rodríguez** (Argentina)

PATROCINADORES:

AUSPICIA: MICORREDES

<https://meihaper.org/es/eventos-celebrados/>

# Cooperation activities and info





# Cooperation activities and info

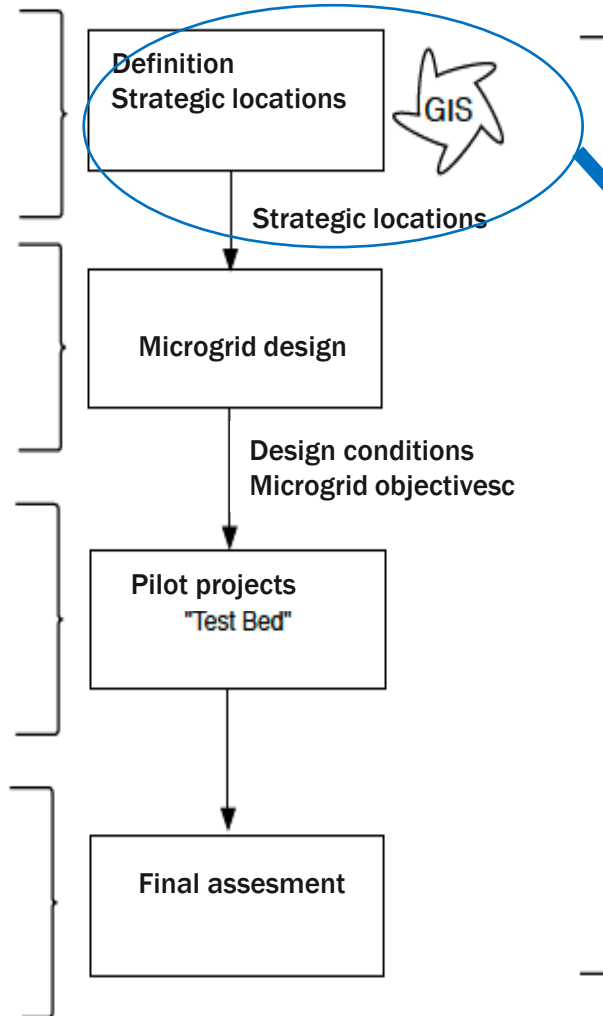
**Criteria:**

- Geographical location
- Supply conditions
- Risk analysis
- Productivity

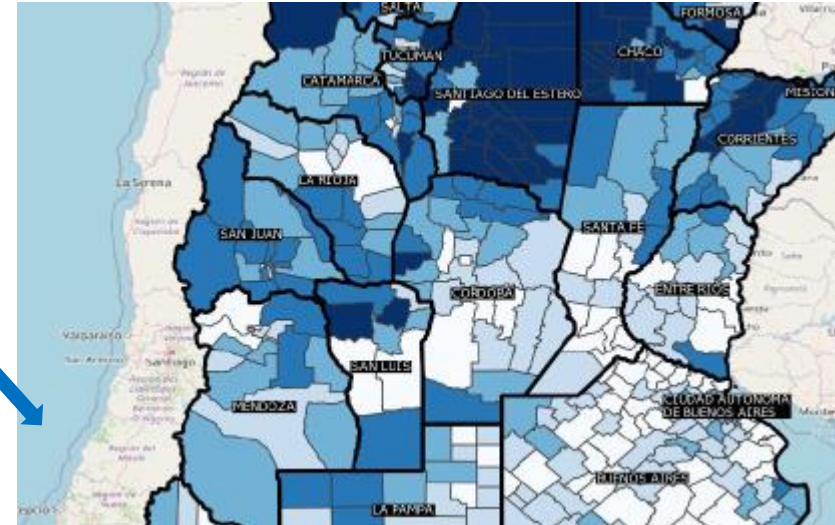
- Location's characteristics
- Local energy resources
- Functionality

- Control and Monitoring
- Local controls
- EMS

- Operation requirements
- Operation and monitoring
- Performance assesment



Key elements  
Good practices



## Catastro

Tras validar la información con los organismos locales, se obtienen **79 localidades entre las 5 macrozonas** aptas para ser alimentadas con una solución tipo Micro-red, 63 de ellas con información completa para su dimensionamiento.

En base a estas, se seleccionan y visitan en terreno **18 comunidades representativas**.

Localidad	Macrozona	Origen	Producto	Comuna
Elvira (Categoría 1)	Norte	Alfaro y Potosí	Alfaro	Comodoro Rivadavia
Elvira (2)	Norte	Tucumán	El Tucumán	Comodoro Rivadavia
Elvira (3)	Norte	Tucumán	El Tucumán	Comodoro Rivadavia
Elvira (4)	Norte	Tucumán	El Tucumán	Comodoro Rivadavia
Elvira (5)	Norte	Tucumán	El Tucumán	Comodoro Rivadavia
Elvira (6)	Norte	Tucumán	El Tucumán	Comodoro Rivadavia
Elvira (7)	Norte	Tucumán	El Tucumán	Comodoro Rivadavia
Elvira (8)	Norte	Tucumán	El Tucumán	Comodoro Rivadavia
Elvira (9)	Norte	Tucumán	El Tucumán	Comodoro Rivadavia
Elvira (10)	Norte	Tucumán	El Tucumán	Comodoro Rivadavia
Elvira (11)	Norte	Tucumán	El Tucumán	Comodoro Rivadavia
Elvira (12)	Norte	Tucumán	El Tucumán	Comodoro Rivadavia
Elvira (13)	Norte	Tucumán	El Tucumán	Comodoro Rivadavia
Elvira (14)	Norte	Tucumán	El Tucumán	Comodoro Rivadavia
Elvira (15)	Norte	Tucumán	El Tucumán	Comodoro Rivadavia
Elvira (16)	Norte	Tucumán	El Tucumán	Comodoro Rivadavia
Elvira (17)	Norte	Tucumán	El Tucumán	Comodoro Rivadavia
Elvira (18)	Norte	Tucumán	El Tucumán	Comodoro Rivadavia
Elvira (19)	Norte	Tucumán	El Tucumán	Comodoro Rivadavia
Elvira (20)	Norte	Tucumán	El Tucumán	Comodoro Rivadavia
Elvira (21)	Norte	Tucumán	El Tucumán	Comodoro Rivadavia
Elvira (22)	Norte	Tucumán	El Tucumán	Comodoro Rivadavia
Elvira (23)	Norte	Tucumán	El Tucumán	Comodoro Rivadavia
Elvira (24)	Norte	Tucumán	El Tucumán	Comodoro Rivadavia
Elvira (25)	Norte	Tucumán	El Tucumán	Comodoro Rivadavia
Elvira (26)	Norte	Tucumán	El Tucumán	Comodoro Rivadavia
Elvira (27)	Norte	Tucumán	El Tucumán	Comodoro Rivadavia
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Elvira (29)	Norte	Tucumán	El Tucumán	Comodoro Rivadavia
Elvira (30)	Norte	Tucumán	El Tucumán	Comodoro Rivadavia
Elvira (31)	Norte	Tucumán	El Tucumán	Comodoro Rivadavia
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Elvira (33)	Norte	Tucumán	El Tucumán	Comodoro Rivadavia
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Elvira (62)	Norte	Tucumán	El Tucumán	Comodoro Rivadavia
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Elvira (65)	Norte	Tucumán	El Tucumán	Comodoro Rivadavia
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Elvira (69)	Norte	Tucumán	El Tucumán	Comodoro Rivadavia
Elvira (70)	Norte	Tucumán	El Tucumán	Comodoro Rivadavia
Elvira (71)	Norte	Tucumán	El Tucumán	Comodoro Rivadavia
Elvira (72)	Norte	Tucumán	El Tucumán	Comodoro Rivadavia
Elvira (73)	Norte	Tucumán	El Tucumán	Comodoro Rivadavia
Elvira (74)	Norte	Tucumán	El Tucumán	Comodoro Rivadavia
Elvira (75)	Norte	Tucumán	El Tucumán	Comodoro Rivadavia
Elvira (76)	Norte	Tucumán	El Tucumán	Comodoro Rivadavia
Elvira (77)	Norte	Tucumán	El Tucumán	Comodoro Rivadavia
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Elvira (79)	Norte	Tucumán	El Tucumán	Comodoro Rivadavia

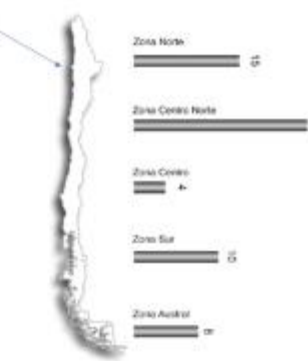
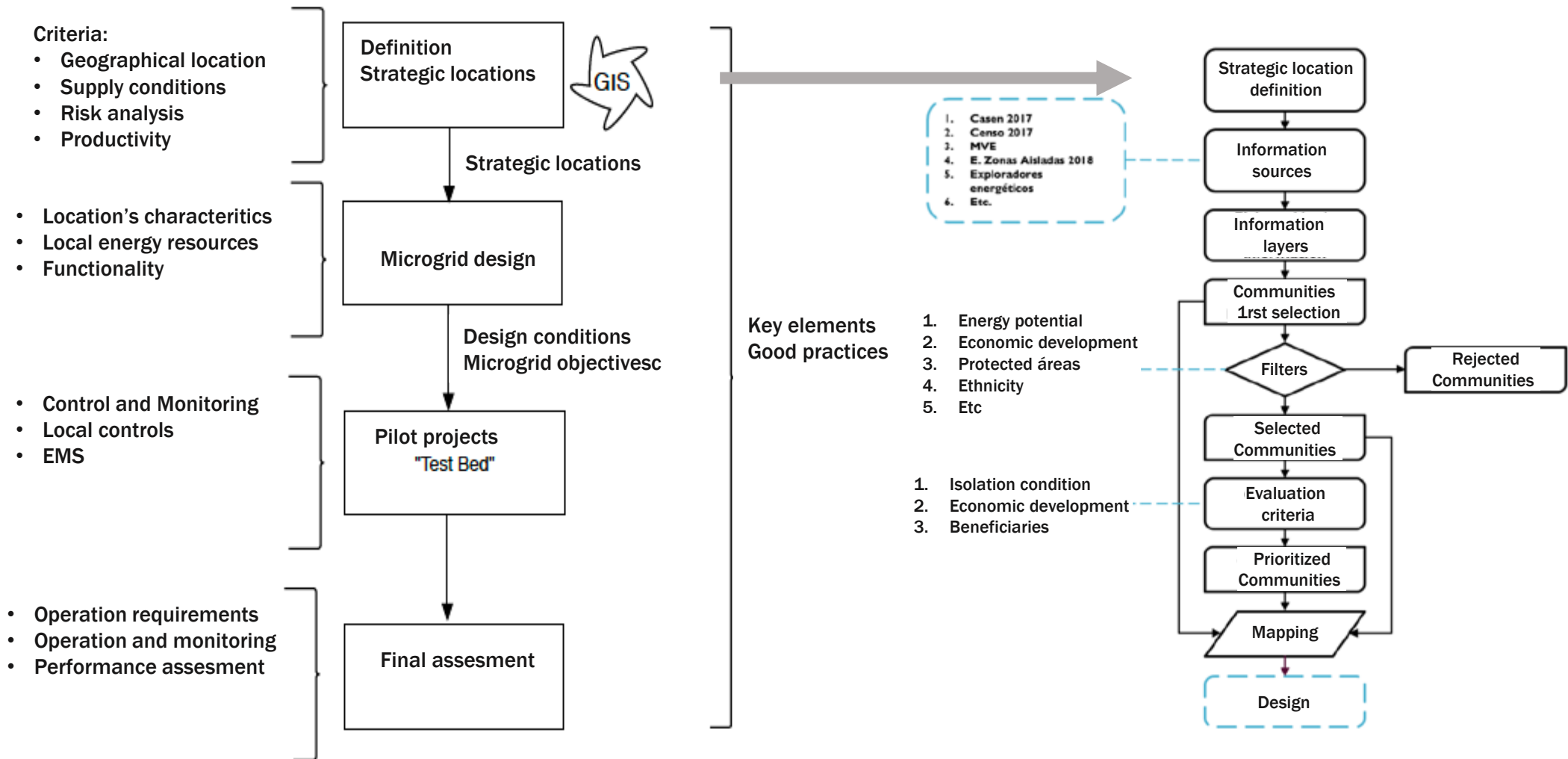


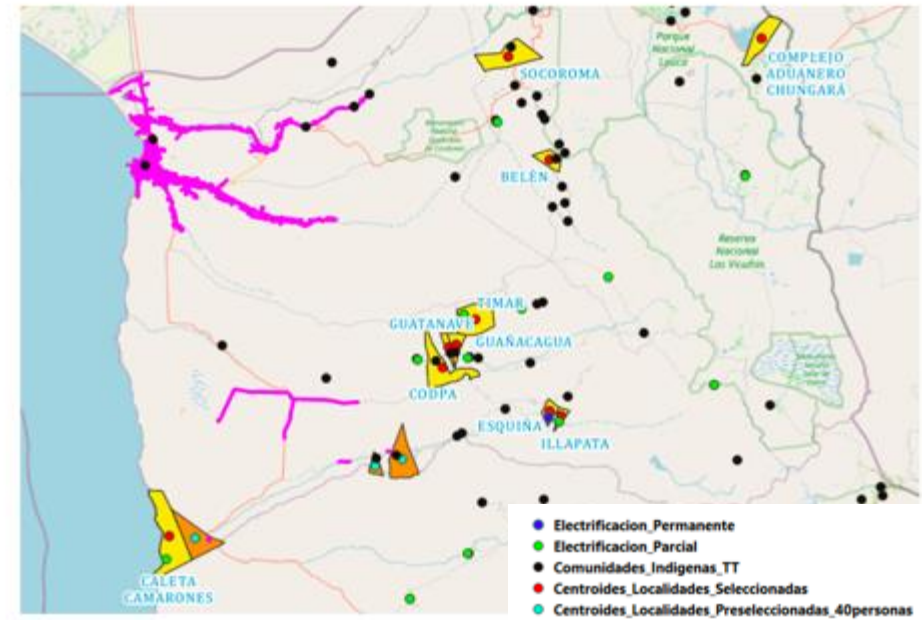
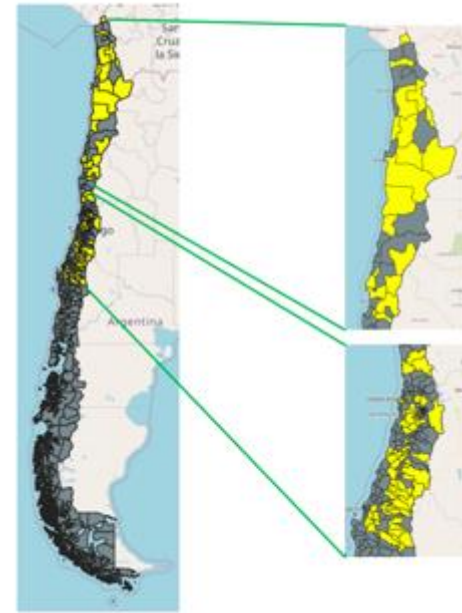
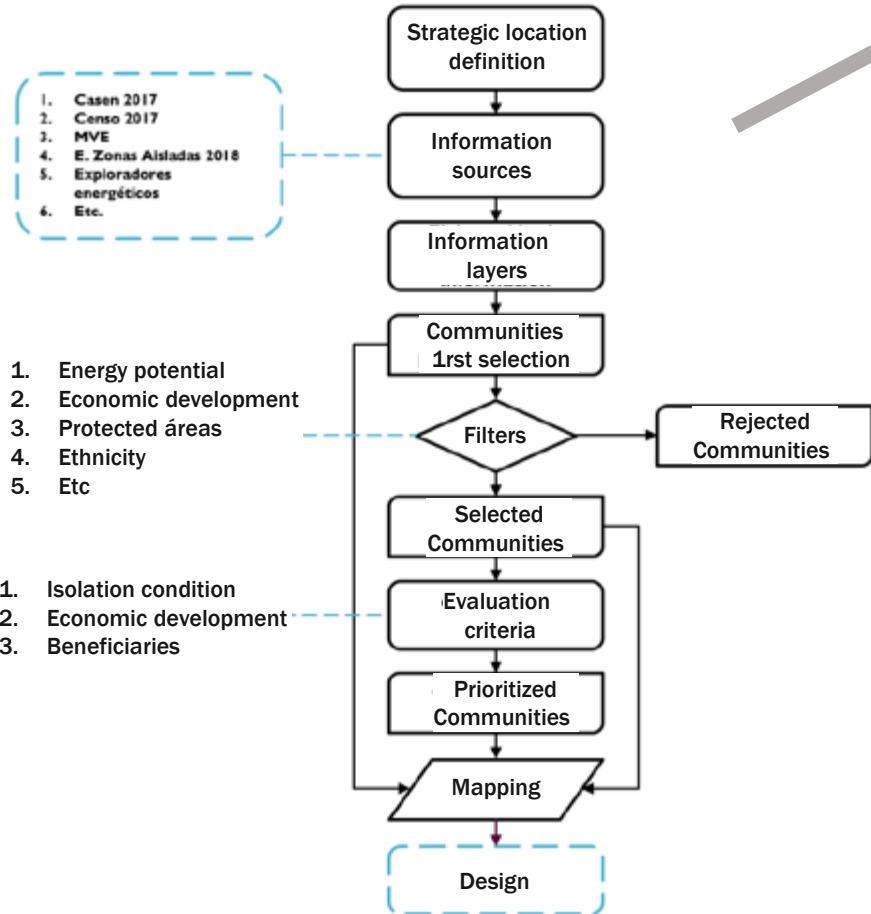
Tabla 1. Localidades representativas de cada macrozona.



# Cooperation activities and info



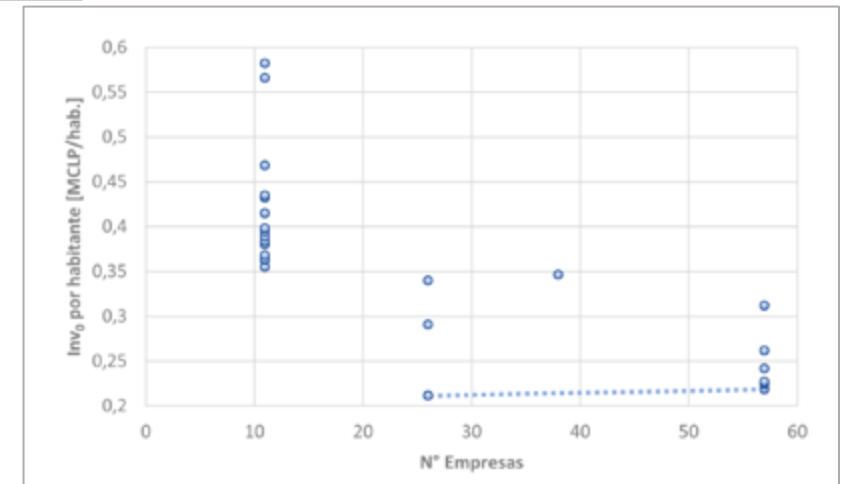
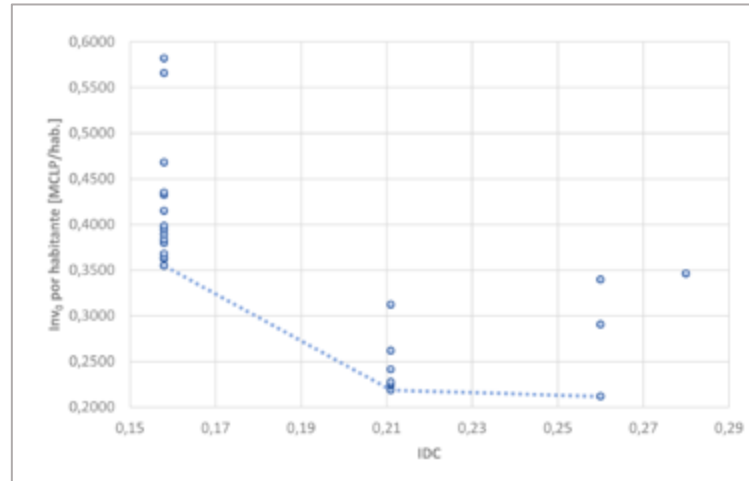
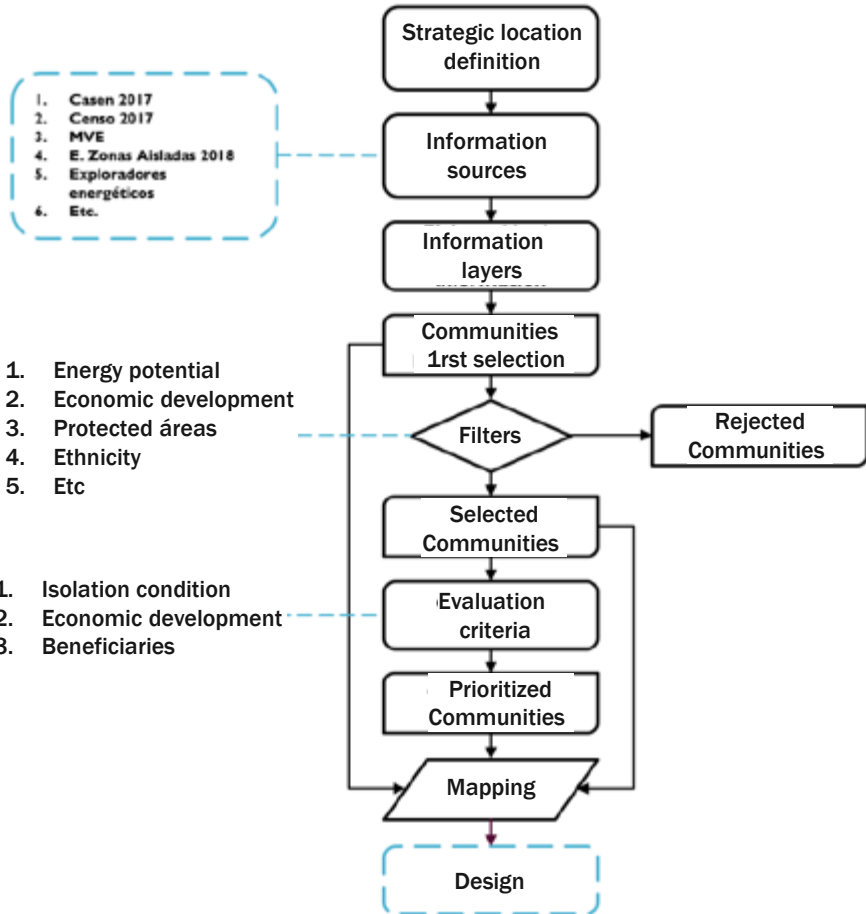
# Cooperation activities and info



PRIORIZATION IS BASED ON INVESTMENT COSTS, HUMAN DEVELOPMENT INDEX, AND ECONOMIC ATIVITY AT THE LOCATION

Source: José Ortiz

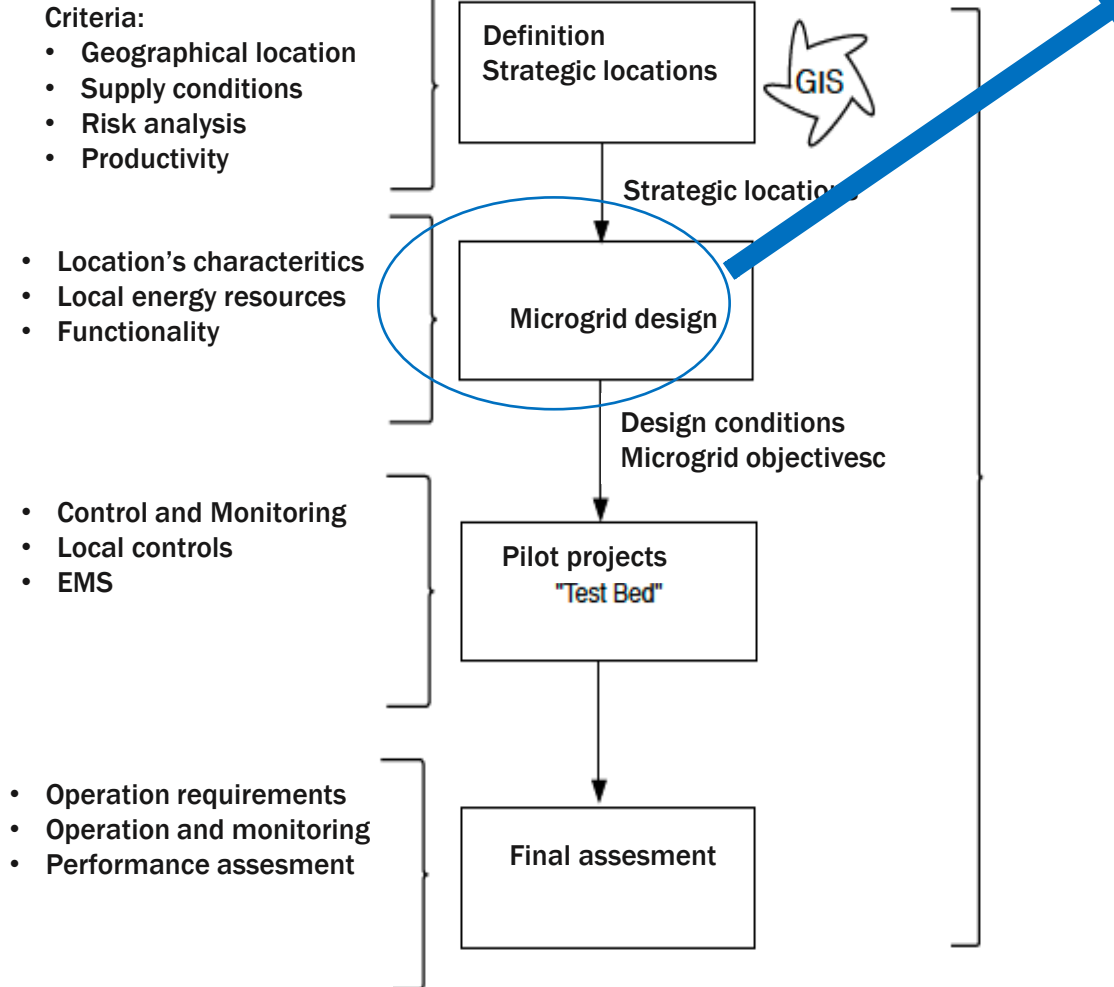
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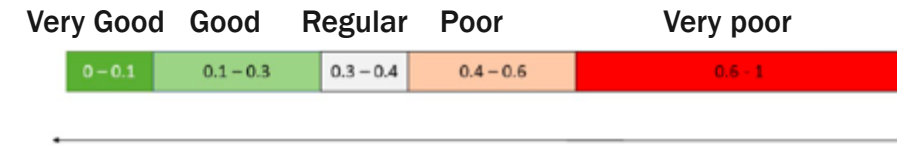
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# Cooperation activities and info



## Sustainability Index

Economic  
Social  
Environmental



**Positive:**  
 High sustainability  
 Economic viability  
 No (few) social conflicts  
 Low environmental impact

**Negative:**  
 Low sustainability  
 Non economic viability  
 Social conflicts may appear  
 Recommendations ...





# Cooperation activities and info

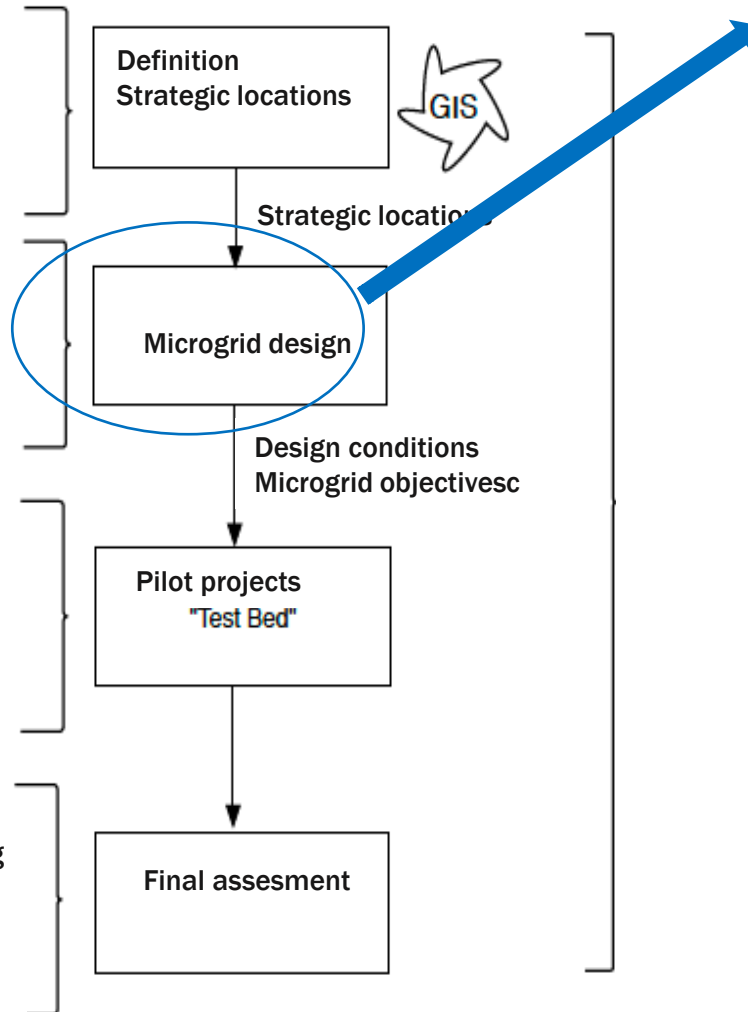
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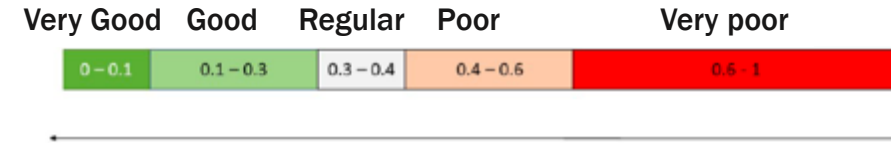
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## Sustainability Index

Economic  
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**Positive:**  
High sustainability  
Economic viability  
No (few) social conflicts  
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**Negative:**  
Low sustainability  
Non economic viability  
Social conflicts may appear  
Recommendations ...

## Final results:

Local microgrids	Regional microgrid
$I_{sostG} = 0.33$	$I_{sostR} = 0.49$



# Cooperation activities and info

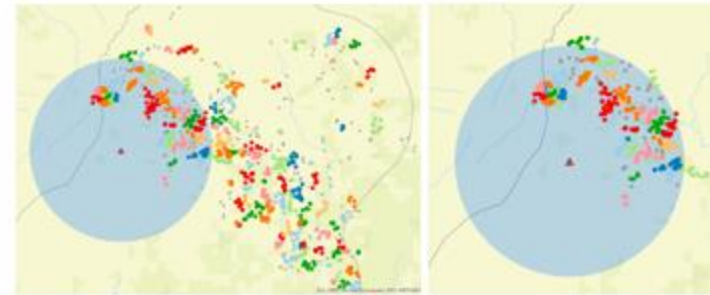
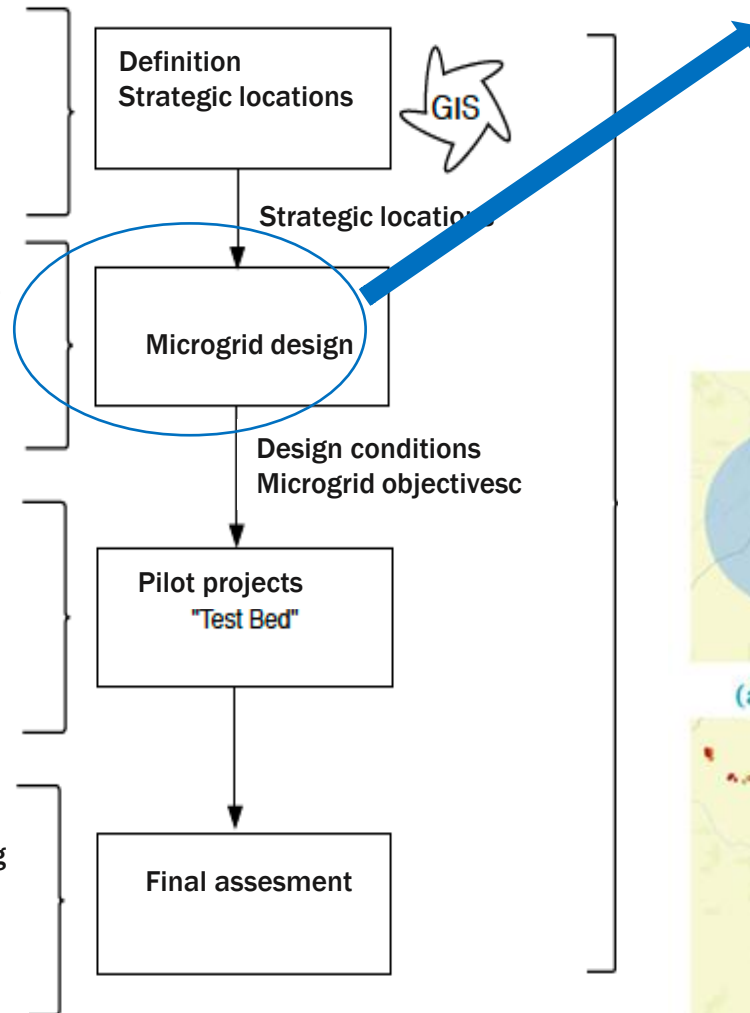
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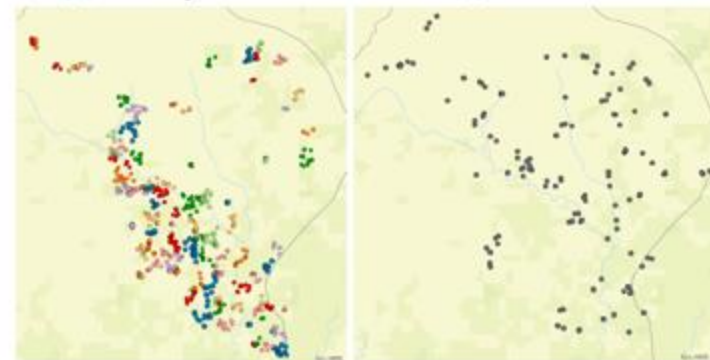
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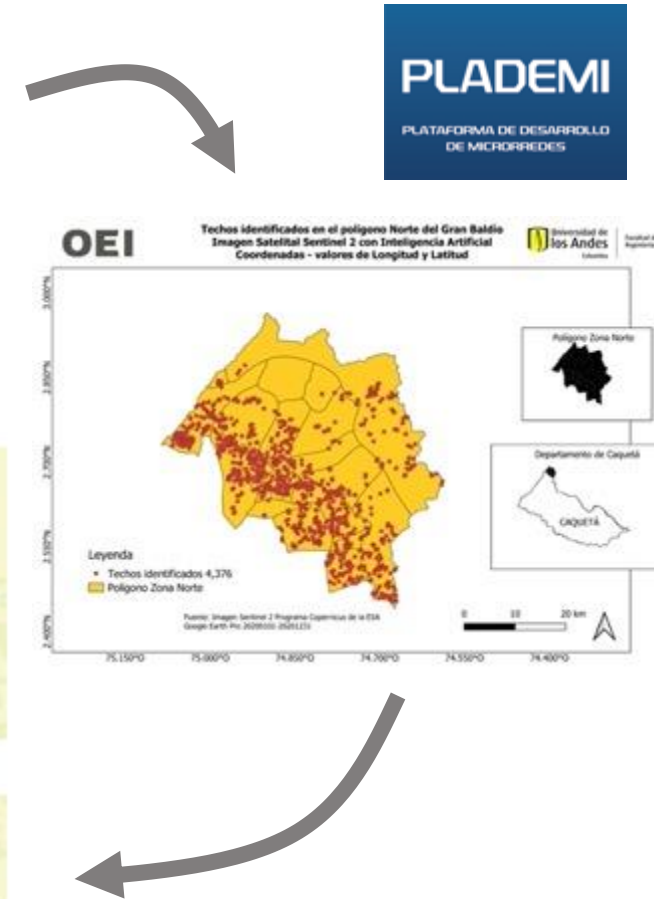
(a) Datos y área de 15km

(b) Extensión de red

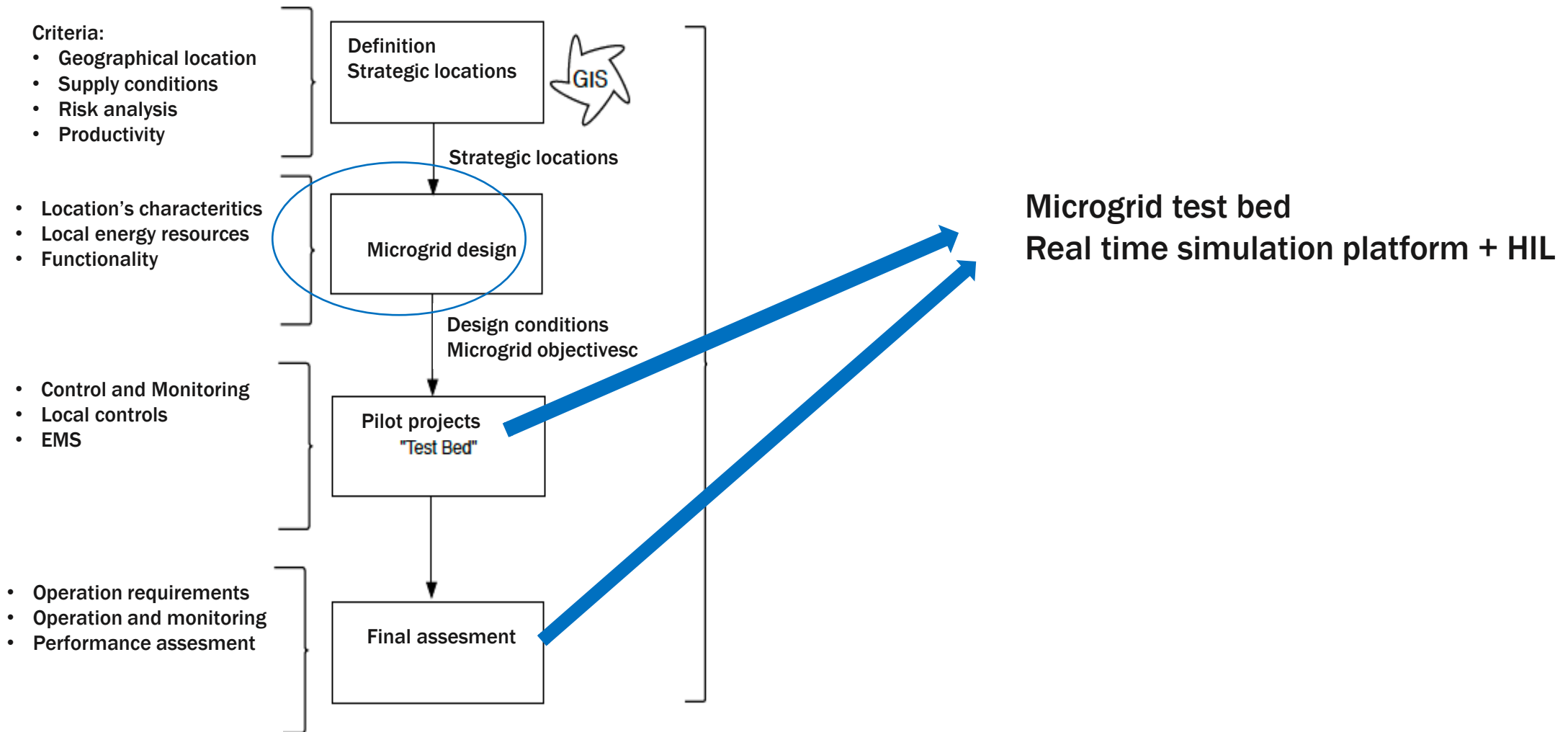


(c) Microrred

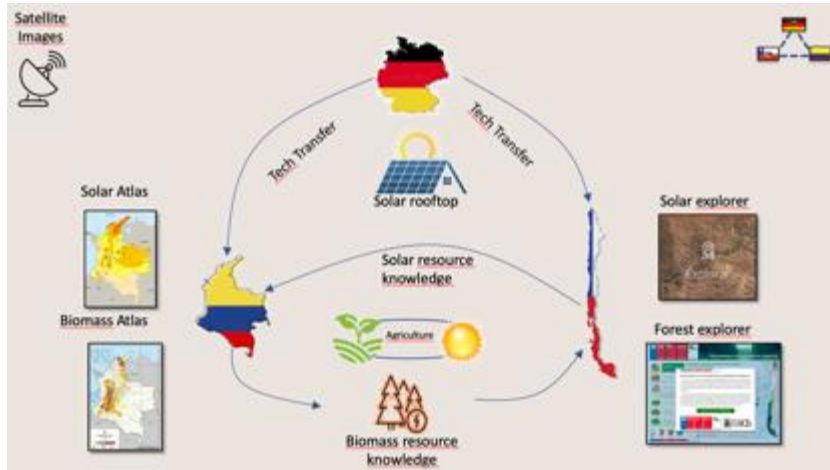
(d) SHS



# Cooperation activities and info



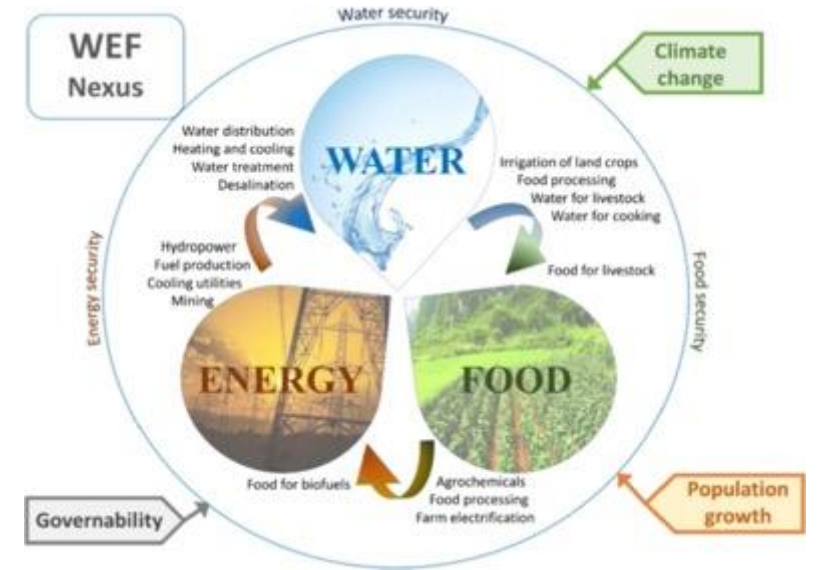
# Cooperation activities and info



Yuca/Mandioca



## Agro PV + microgrids



Jürgen Mahlkecht, Ramón González-Bravo, Frank J. Loge, *Water-energy-food security: A Nexus perspective of the current situation in Latin America and the Caribbean*, Energy, Volume 194, 2020.

Agro production improved  
Energy and Water Access  
Distribution grid resilience and reliability  
Agro + prosuming

Source: Andrea Cusva, Rocío Sierra





THANK YOU

