NAPS Community

Community to Support
The National Adaptation Plans
In Latin America

Webinar 2: Assessment of options for adaptation measures: Methods and experiences of selection and prioritization in Paraguay and Uruguay

UN environment

REGATTA
Regional Gateway for Technology Transfer and Climate Change Action in Latin America and the Caribbean

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PRACTICAL ACTION
Technology challenging poverty

NAP-GSP
NATIONAL ADAPTATION PLAN GLOBAL SUPPORT PROGRAMME

Agenda

Welcome to the NAPS Community of Practice

Lili Ilieva. Moderator and climate adaptation expert – Practical Action.

Introduction

Alejandro Moreno, Coordinator of the EUROCLIMA Programme for UN Environment

Cost Benefit Analysis of Climate Change Adaptation Policies

Dr. Roberto D. Ponce Oliva, Research Professor at the Faculty of Economics and Business, Universidad de Desarrollo, Chile

Policy for Climate Change Adaptation: The Case of Uruguay

Mónica Gómez, Ministry of Housing, Spatial Planning and Environment (MVOTMA), Uruguay.

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Introduction

NAPS Community

Community to Support
The National Adaptation Plans
In Latin America

Alejandro Moreno,
Coordinator of the EUROCLIMA Programme
for UN Environment

Universidad del Desarrollo
Universidad de Excelencia

Cost Benefit Analysis of Climate Change Adaptation Policies

Roberto D. Ponce Oliva (Ph.D.)

April 18, 2017

Outline

- Impacts (economic) of Climate Change
- Adaptation Policies
- Prioritization Methodologies
- Challenges of the CBA
- Case study

1. Impacts of Climate Change

- **Δ Temperature**
- **Δ Precipitations**

1. **Health**
   - Mortality and morbidity related to climate.
2. **Agriculture**
   - Crop yields.
   - Demand for irrigation.
3. **Forests**
   - Geographical distribution of the forest.
   - Primary productivity.
4. **Water**
   - Supply and quality of water.
   - Competition for the use of water.
5. **Coastal areas**
   - Erosion.
   - Flood.
6. **Species and natural areas.**
   - Loss of habitat.
7. **Fishing**
   - Ocean acidification

Well-being

2. Adaptation Policies

- Climate Policies: seek to reduce the impacts associated with expected changes in environmental conditions.
  - Adaptation
  - Mitigation
- Adaptation
  - Involves actions to anticipate the adverse effects of climate change, either in a preventive way to minimize damage, or taking advantage of the opportunities the climate change can bring. (*eu-env*).

2. Adaptation Policies

- Why is it crucial to value?
  - Policy actions include changes: economic, social, cultural, and institutional
  - Prioritize based on a common metric ($)
  - The economic criterion is one of the criteria to consider:
    - Political
    - Social
    - Cultural
  - We need to be sure that every **$** invested in climate policies improves the well-being of the population.
    - Opportunity cost!

2. Adaptation Policies

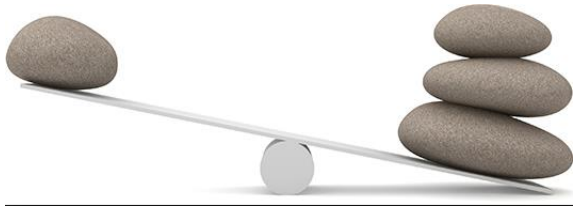
It's a matter of balance!

$$ Impacts

$$ Policies

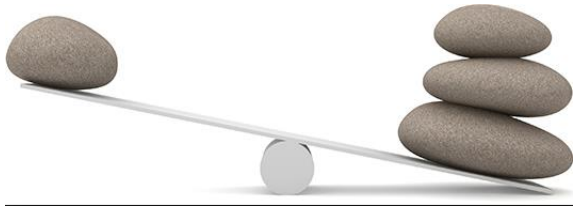
3. Prioritization Methodologies

- Cost-benefit
- Cost effectiveness
- Multi-criteria



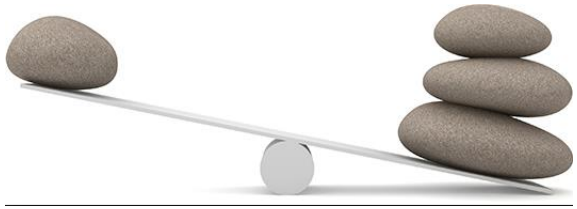
3. Prioritization Methodologies

- Cost-benefit
  - Method widely used in evaluation/prioritization of projects/policies/programs.
  - Theoretical basis: the benefits of a policy result in an increase in welfare, while costs result in a decrease in the well-being of society.
  - To the extent that all benefits of a policy exceed all costs, then the policy passes the CBA.



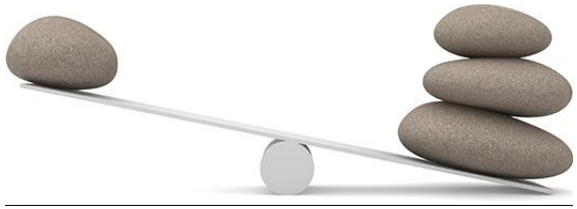
4. Challenges of the CBA

- Benefit aggregation: what groups will be considered to add benefits associated to a specific policy?
  - Local, regional, national, global
  - By age group
  - By gender
  - Other?



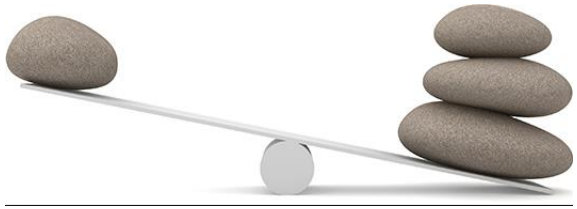
4. Challenges of the CBA

- What is the relevant time period for evolution?
  - Climate policies are characterized by incurring in short-term costs, which allow to enjoy benefits in the long term.
  - Short-term evaluation: greater cost relevance
  - Long-term evaluation: greater relevance of benefits



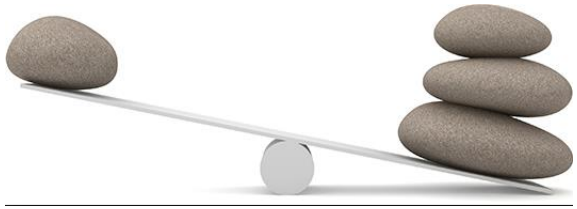
4. Challenges of the CBA

- Discount rate
  - The discount rate indicates that a benefit obtained today does not have the same value as the benefit obtained in the future.
  - Discount Options
    - Exponential discount
    - Hyperbolic discount
  - In any case, the choice of discount rate has ethical implications



4. Challenges of the CBA

- Example: relevance of discount rate
  - Provision to pay (DAP) ecosystem services associated with a network of marine protected areas in Chile.
    - Exponential discount
      - Relevant period: 10 years
      - Actual Value DAP: 10 USD
    - Hyperbolic discount
      - Relevant period: 300 years
      - DAP Actual Value: 15 USD



5. Case Study

"Comprehensive Sanitation Program for the Bay of Asunción and the Urban Streams (PR-L1029)"

The objective of this consultancy was to determine the economic value of the change in welfare associated with the improvement of ecosystem services.

New environmental conditions would reduce the capacity of the ecosystem to treat wastewater.

5. Case Study

- Intervention Options
  - Sanitation Project on Lake Ypacarai
  - Sanitation Project in Bahia de Asunción
  - Sanitation Project in both places

5. Case Study

- Results on water quality

Quality level	Bay/Lake
1. Bad	• Water contaminated with large amounts of litter and seaweed all year round. • Beach disabled for 9 months a year • Water not allowed to swim and perform all kinds of water sports during 9 months a year due to the high risk of contracting skin and stomach diseases. • 9 months include the summer period. • No presence of birds and fish. In the case of the lake, the water is greenish and foamy and may have strong odor.
2. Regular	• Dirty water with garbage and seaweed during about mid-year. • Beach enabled all year round. • Disabled water for swimming and water sports for 6 months a year months due to risks of skin and stomach diseases. • The 6 months include the summer period. Severe reduction of number of birds and fish.
3. Good	• Clean water but with pollution episodes of about 3 months with garbage and algae. • Beach enabled all year round. • Water enabled for swimming and for water sports almost all year, except for 3 months due to risks of skin and stomach diseases. • The 3 months correspond to the summer season. Small decrease of the number birds and fish.
4. Very Good	• Clean water but with pollution episodes with garbage and algae for about 3 months. • Beach enabled all year round. • Water enabled for swimming and for water sports almost all year, except for 3 months due to risks of skin and stomach diseases. • The 3 months correspond to the summer season. Small decrease of the number birds and fish.

5. Case Study

- Direct Beneficiaries
  - Recreation, economic activities (tourism), communities with better health.
- Indirect beneficiaries
  - Cultural, ethical or existence benefits
- Costs
  - Construction costs of the sanitation system

5. Case Study

- Methodologies used
  - Transfer of benefits: Effects on health
  - Choice experiment: effects on recreation and biodiversity
  - Changes in productivity: effects on tourism

5. Case Study

- Water quality: Regular - Regular

Benefits in US $	
Health	7.6 household/year
Recreation, landscape and biodiversity	85.3 household/year
Tourism	0

Costs in US $	
Lago Ypacaraí	40 million investment
	750,000 per operational year
Bahía de Asunción	17 million investment
	340,000 per operational year
Total	57 million investment
	1,09 millions per operational year

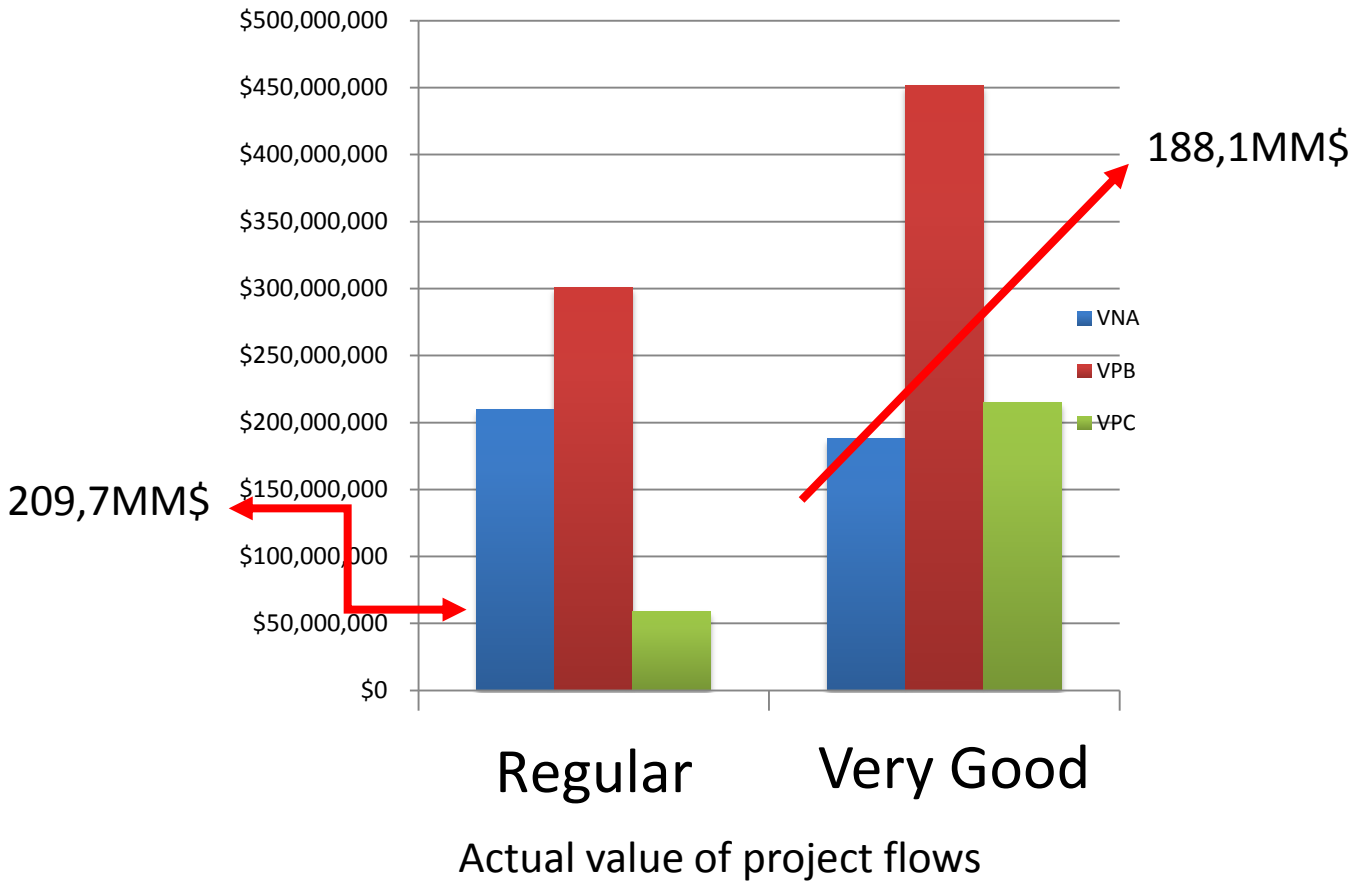
5. Case Study

- Water quality: very good- very good

Benefits in US $	
Health	7.6 household/year
Recreation, landscape and biodiversity	130.7 household/year
Tourism	310.314 total/year

Costs in US $	
Lago Ypacaraí	150 million investment
	3 millions per operational year
Bahía de Asunción	57 million investment
	1.14 millions per operational year
Total	207 million investment
	4,14 millions per operational year

Costs versus Benefits



- The evaluation was projected to 30 years with a discount rate of 12% per year.

Final Conclusions

- **The use of CBA depends on the level of information available**
  - ***All* costs and *All* benefits**
- **Technical aspects**
  - **Discount rate, evaluation perion**
- **Other considerations**
  - **Social, cultural, and institutional aspects**

MVOTMA
Ministerio de Vivienda
Ordenamiento Territorial
y Medio Ambiente

PNUMA

REGATTA
Portal Regional para la Transferencia de Tecnología y la Acción frente al Cambio Climático en América Latina y el Caribe

POLICY FOR CLIMATE CHANGE ADAPTATION

THE CASE OF URUGUAY

May 4th, 2017

CONTEXT OF URUGUAY

Uruguay is a developing country with medium income and high human development (UNDP)

CONTINENTAL TERRITORY: 176,215 km2
TERRITORIAL SEA: 140,000 km2
POPULATION: 3,251,526 inhab.

CONTEXT OF URUGUAY

MVOTMA

•**NATURAL RISKS:**

•They are closely associated with climatic events (droughts, floods, cold waves and heat, phenomena of micro- and macro scale - hail and tornadoes).

Heat wave record
December 2013

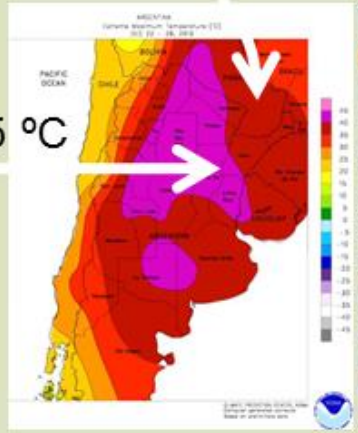
30 – 35 ºC

- **SEQUIAS: La Niña event**

Economic damages

- 1999-2000: > US $ 200 million
- 2008 - 2009: > US $ 950 million

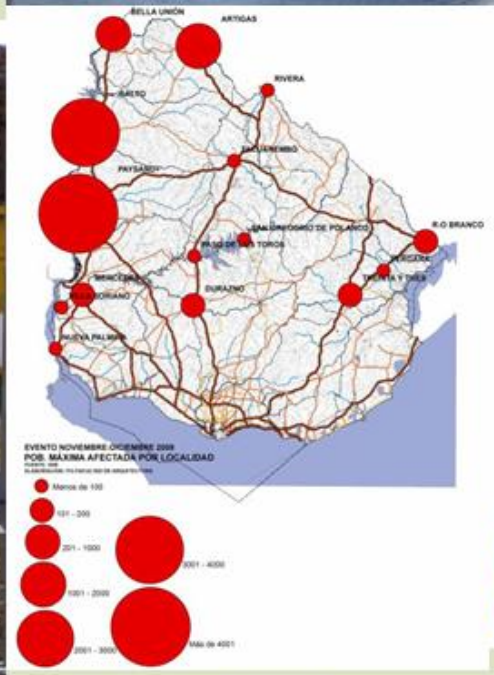
40 – 45 ºC



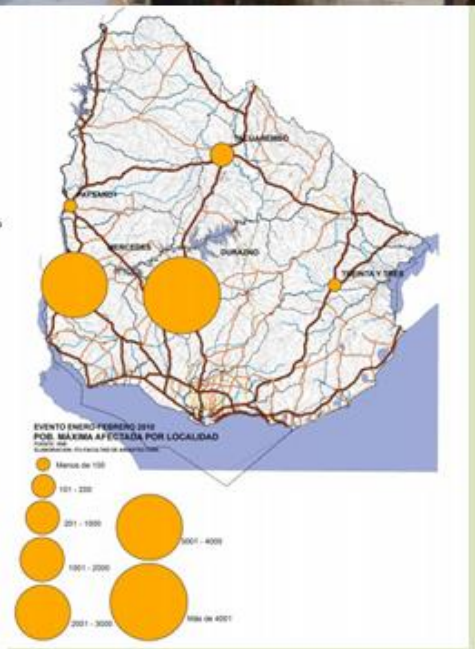
CONTEXT OF URUGUAY

- **FLOODS: El Niño Event**
- 2007: 14,000 people evacuated, estimated cost of losses > US $ 21 million

- 2009-2010: 14,886 people evacuated



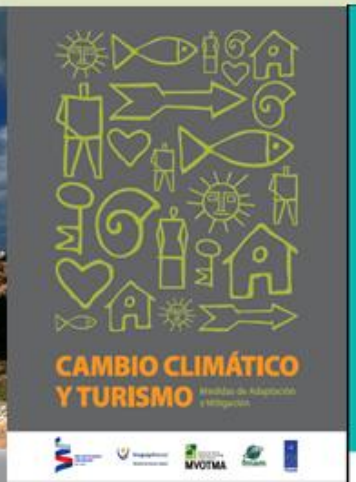
Evento 2009

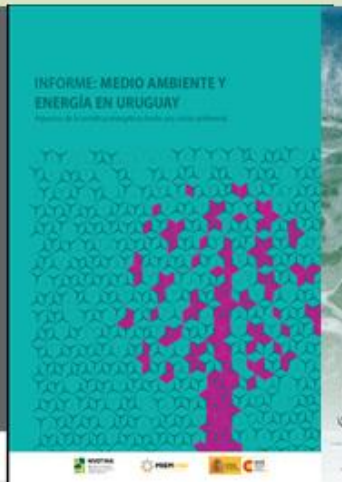


Evento 2010

PUBLIC POLICY APPROACH

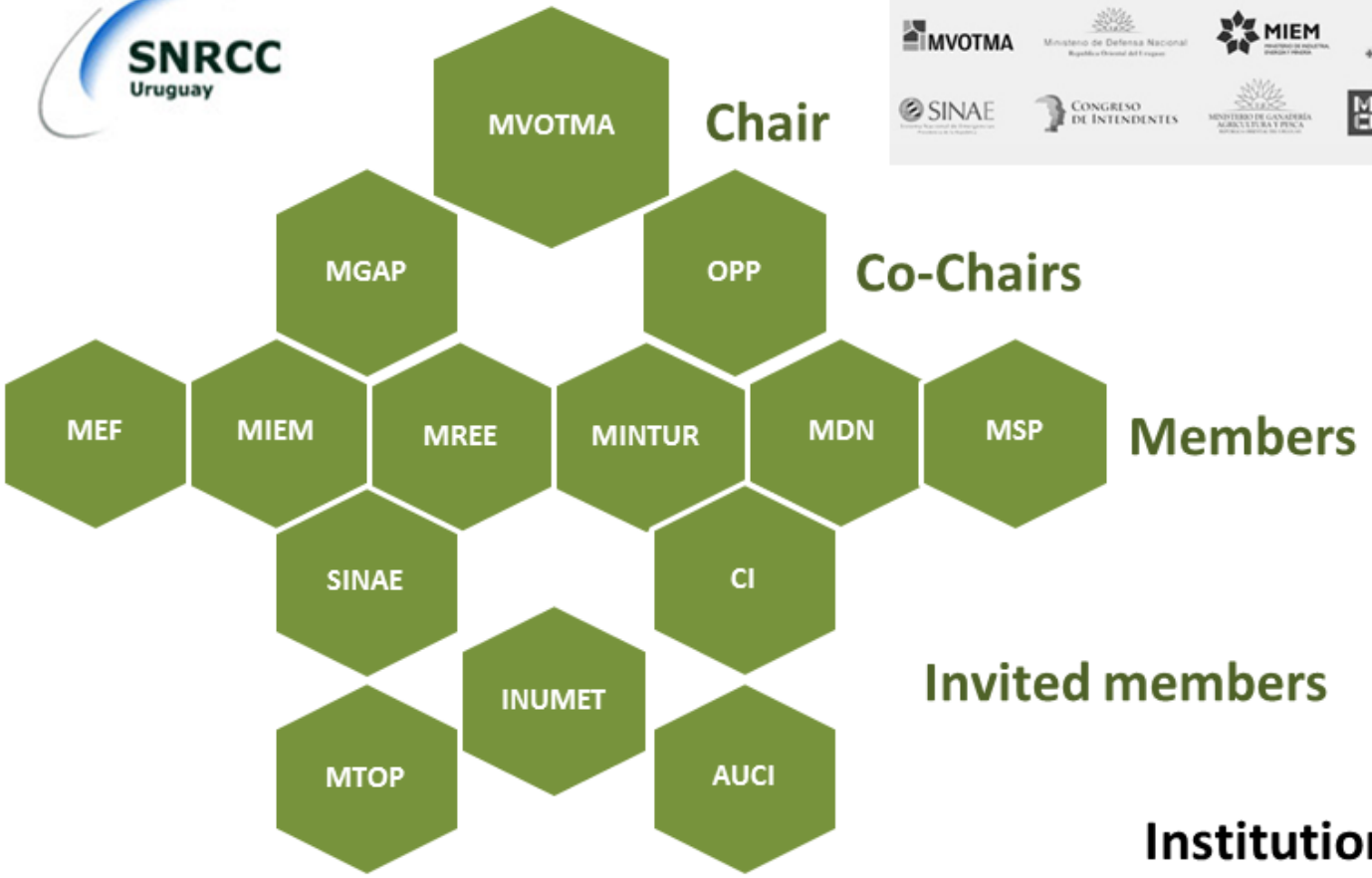
- *1994. Beginning of the Work on topic CC topic in the country: Creation of the UCC*
- *1997. Initial Communication on CC to the UNFCC.*
- *2004. Second National Communication.*
- *2004. Program of General Measures of Mitigation and Adaptation to CC (PMEGEMA)*
- *2010. Third National Communication to the UNFCC2010. Climate Change National Response Plan.*
- *2016. Fourth National Communication.*
- *2017. National Policy on Climate Change.*





NATIONAL RESPONSE SYSTEM TO CC

SNRCC Uruguay



Institutional integration

PUBLIC POLICY APPROACH

TYPE OF RESPONSE

PRODUCTION (Agriculture, Livestock, Forestry, Water Resources, Biodiversity, Insurance)

COAST (Aquatic Ecosystems, Fisheries, Coastal Areas, Tourism)

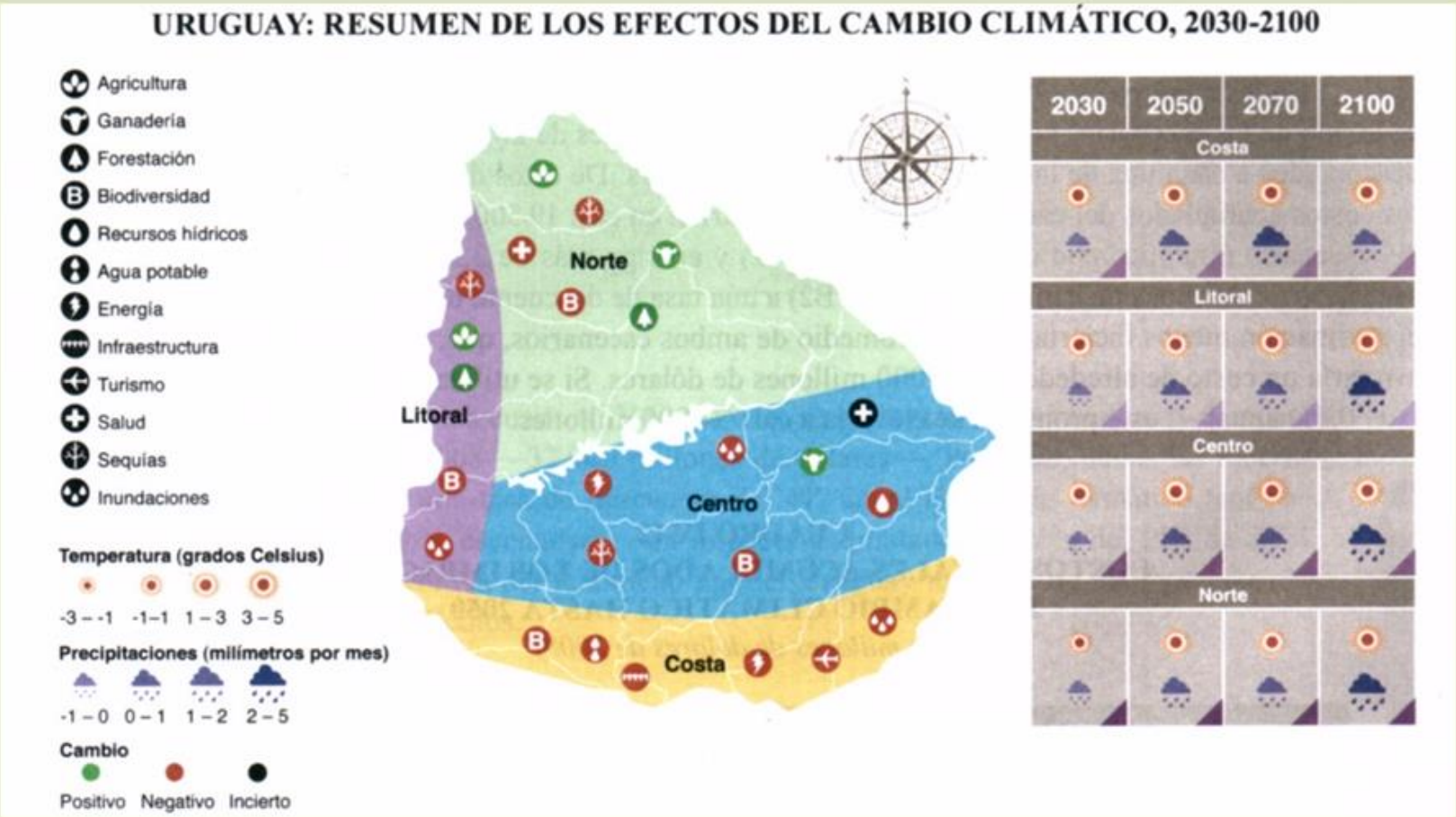
POPULATION CENTRES (Services, Tourism, Urbanism, Construction, Health)ENERGY (Water Resources, Infrastructure, Transportation)

INFORMATION AND MONITORING

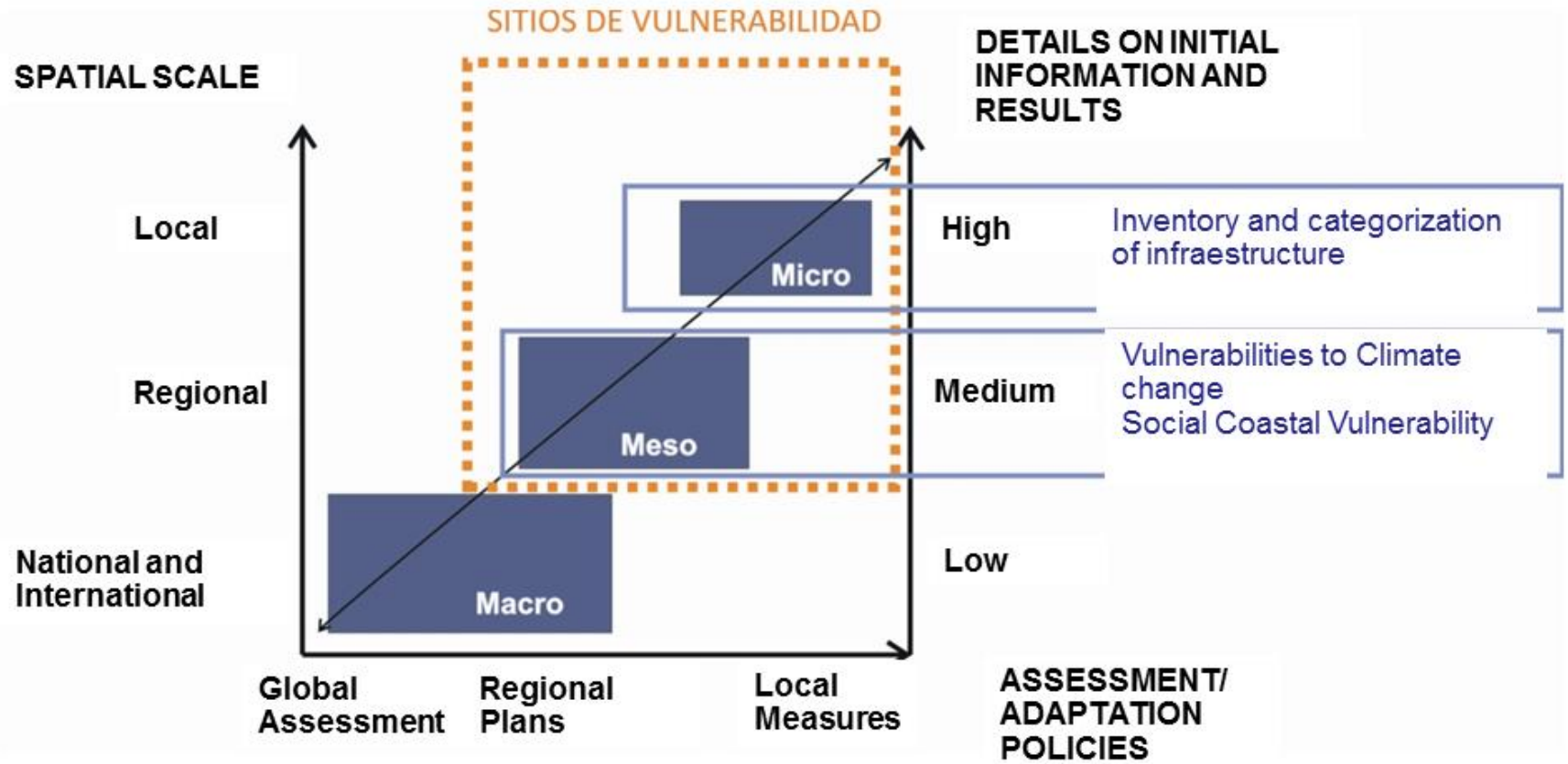
PROBLEM AND VULNERABILITIES

MVOTMA

SYNTHESIS MAP ON THE ECONOMIC IMPACTS OF CLIMATE CHANGE



PUBLIC POLICY: Scales



NATIONAL SCALE: Agricultural and Livestock Policy

DESCRIPTION OF ADAPTATION MEASURES TO VARIABILITY AND CLIMATE CHANGE

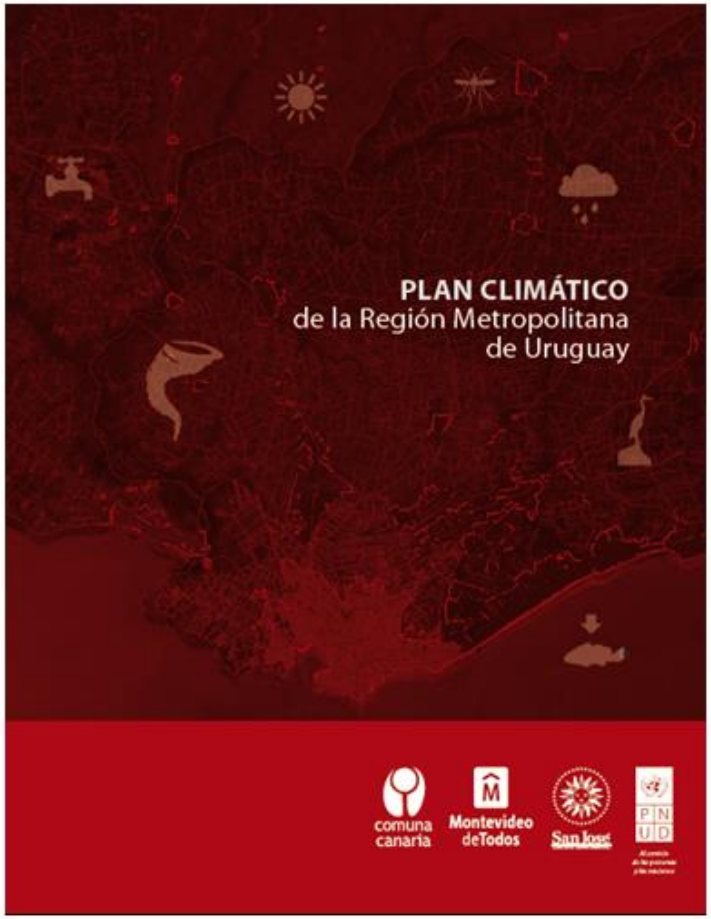
Measure	Main features	Type unit	Resilience Strategy
Gestión multipredial y/o asociativa del agua para fines productivos en ganadería.	Associative field for irrigation of crops for stock and strategic feeding of key partner producer categories. Exercise with calves.	Irrigation of 250 ha Self catering breeders of population unit Basalto with up to 750 ha of surface.	Efficient and Sustainable use of rainwater and surface runoff. Management and enhancement of organizational skills to deal with climate risks.
Adopción de sistemas de producción basados en un manejo sustentable del Campo Natural (CN) (priorizando el uso de una carga adecuada).	Management of CN based on monitoring status and availability. Load adjustment. Decision making system for preventive measures.	Production plant of cattle breeder up to 750 ha.	Efficient use and sustainable production to CN.
Forage banks managed by organizations	Production of wet grain of sorghum in associative way.	Analysis based on a case study as the basis of modeling.	Management and enhancement of organizational skills to deal with climate risks.
Incorporation of piles of shade and shelter.	Identification of factors of positive effects of the measure.	For breeding farms of up to 750 ha.	Decreased of caloric stress,Improving of well-being and prevention of skin diseases.

NATIONAL SCALE: Agricultural and Livestock Policy

FORAGE BANKS MANAGED BY ORGANIZATIONS: Barriers, impact and challenges of the measure

Barriers	Impact	Policy instruments challgenges
At producers level: Lack of experiebce for the management of organisational practices. Need of financial capacities (for small producers mainly) **At a regional level:** Lack of services and infrastructure. **At the experience level:** -Limited equippment -Operational costs -Need for working capital	• Facilitate the incororation of new practices of strategic impact in production. • Favour the productive integration and actors integration in the territory • Icrease social capital.	1. Organisation of training instances for associative ventures. 2. Caution for the support in the identification and development of multiple responses in line with needs and specific contexts. 3. Design of financial instruments based on management comminttments. 4. Facilitation of technical asistance mechanisms during identificacion and feasibility analysis of the venture. 5. Develop synergies with other supporting policies.

REGIONAL SCALE: Metropolitan Climate Plan



Mapa 3 . Mapa de impactos relacionados con el cambio climático asociados a actividades agropecuarias (Canelones, Montevideo y San José)

Tormentas
Sequía
Granizo
Exposición solar
Eventos extremos
Cambio en el régimen de precipitaciones
Falta de información
Incendio
Erosión del suelo
Efluentes
Residuos
Plaga y enfermedades
Estrés térmico
Seguridad alimentaria
Inundaciones en áreas productivas
Estrés hídrico
Especies invasoras
Contaminantes agroquímicos
De alto impacto

FUENTES DE INFORMACIÓN: Elaboración del proyecto en conjunto con técnicos y responsables departamentales del sector agropecuario. Mapeo de base con datos provisorios de AGESIC-IDE.

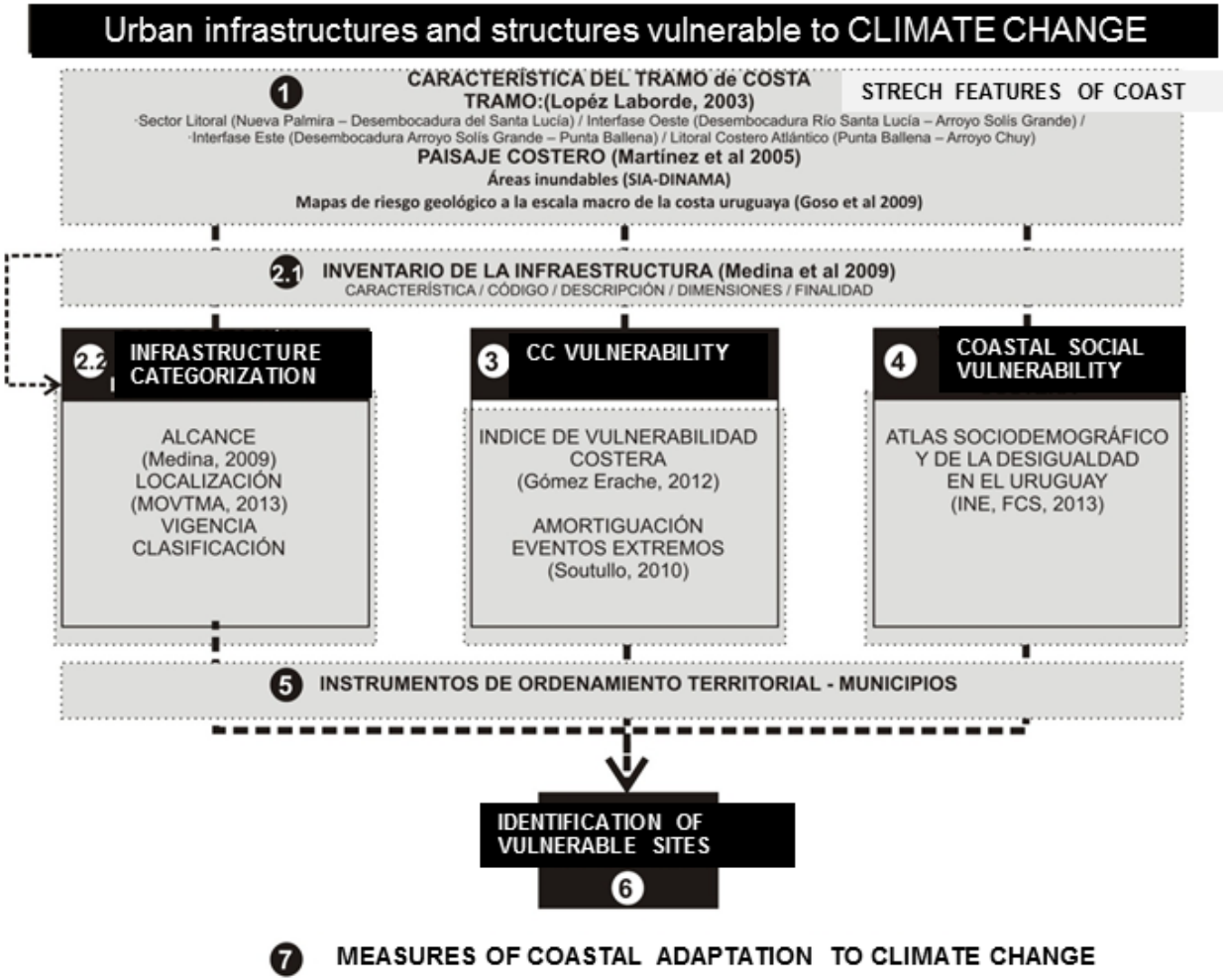
COSTERO

REGIONAL SCALE: Metropolitan Climate Plan

LE C4 **Protection of biodiversity and coastal water systems**

CODE	ACTION	PRIORITY			TYPE	MAMANGEMENT
		IC	IM	ISJ		
METROPOLITANO						
PROY C4.1	Establishment and strengthening of a systematic monitoring system of Río de La Plata for the evolution of the quality of the water, biota, oceanographic variables, including algan blooms.	●	●	●	IE	METROPOLITANA
PROY C4.2	Establishment of preventive measures for the adaptation in coastal areas to contribute to the protection of biodiversity and ecosystems; as well as to deacrease vulnerability of population.				RE	DEPARTAMENTAL
PROY C4.3	Strengthening of the inter-institutional coordination for the incorporation of climate change and vulnerability into the water integrated management of coastal basins.				GF	METROPOLITANA
PROY C4.4	Impact studies and patterns of acuatic ecosystems against climate change.				IE	METROPOLITANA
PROY C4.5	Definition of protection areas for the preservation of marine fauna.				RE	METROPOLITANA

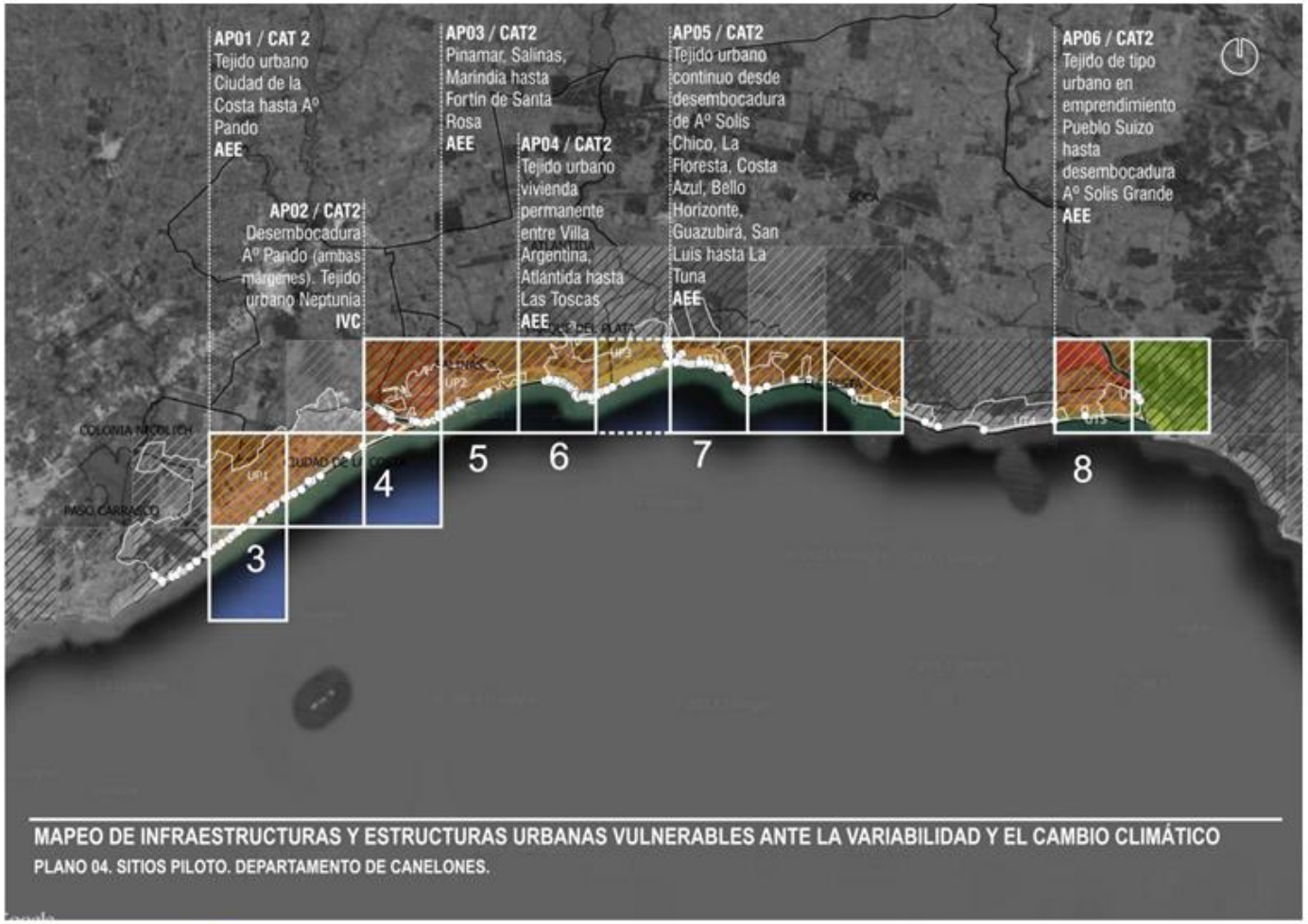
LOCAL SCALE: Coastal Zone



Infrastructure and vulnerable urban structures in the face of variability and climate change.

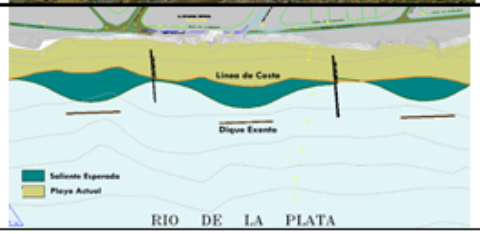
Identification of priority sites.

LOCAL SCALE: Coastal Zone



LOCAL SCALE: Coastal Zone

Comparing different interventions

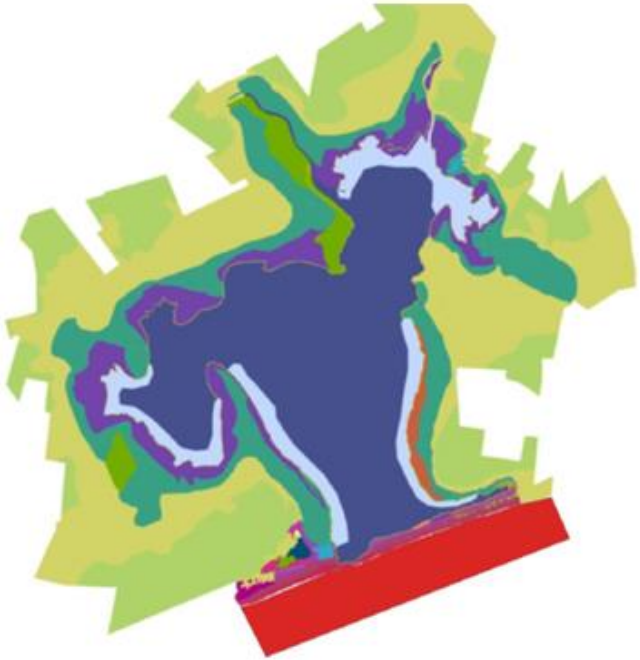
	"No take" (losses after 50 years)	
	rockfill	
	3 goetubes and sand replacement	X

The option of "**no take**" would result in significant impacts on economic activities

Very expensive

Less expensive than "no take"

ROCHA



- **Generation of an opening protocol for Laguna de Rocha**
- **Zoning Birds and CC Scenarios**
- **Technical support for coastal management project in La Paloma Municipality**

MALDONADO

- Creating a CC Unit
- Support with signage and monitoring of beach profiles
- Support for analysis of vulnerability and ecosystem services ECOPARQUE Arroyo MALDONADO

CANELONES

- **Adaptation measures in 6 coastal municipalities**
- **Support for coastal reconstruction plan PDGSN/OPP**

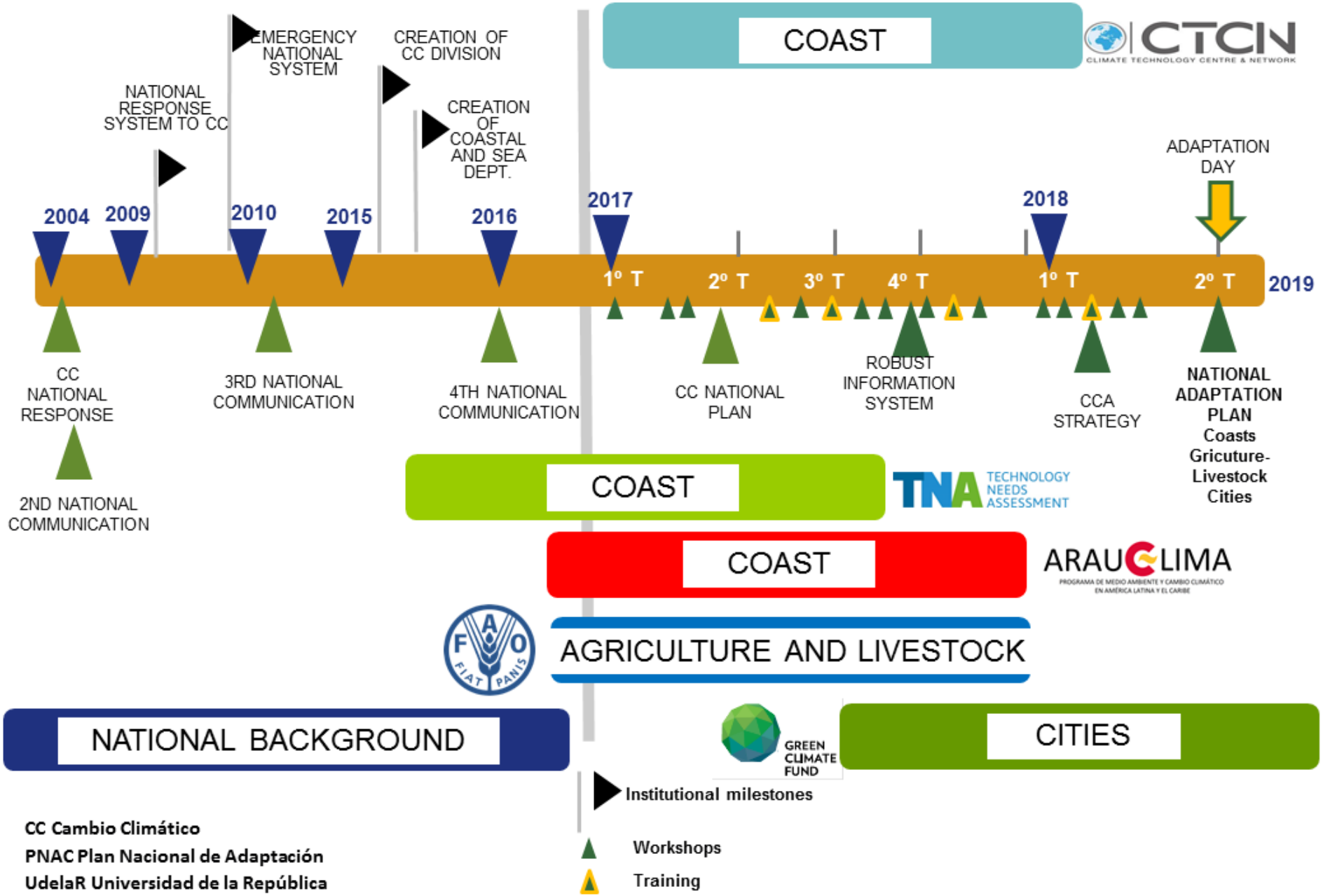
SAN JOSÉ

- Creation of the CC Cabinet
- Sites of erosive intervention in continuous line of greater length
- Monitoring of ISJ + Prefecture + UdelaR
- Effective defense of vulnerable infrastructures
- Financial assessment of coastal adaptation

COLONIA

- Decreased vulnerability and dune regeneration
- Resilient coastal fores
- Articulation between IDC addresses
- Synergy hard and soft work of coastal protection
- EbA on coast north of Cologne

TECHNICAL ASSISTANCE: Strategy



CC Cambio Climático
PNAC Plan Nacional de Adaptación
UdelaR Universidad de la República

MUCHAS GRACIAS

Mónica Gómez Erache
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Discussion with participants

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Now you can ask your questions to the presenter by chat

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Thank you for your participation

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