

Ecosystem based Adaptation and Mitigation to climate change. Experiences in Mexico



INECC

INSTITUTO NACIONAL
DE ECOLOGÍA
Y CAMBIO CLIMÁTICO

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The Paris Agreement. & Nature-Based Solutions: From Policy to Implementation. IUCN. MAY 24. Kaminzimme

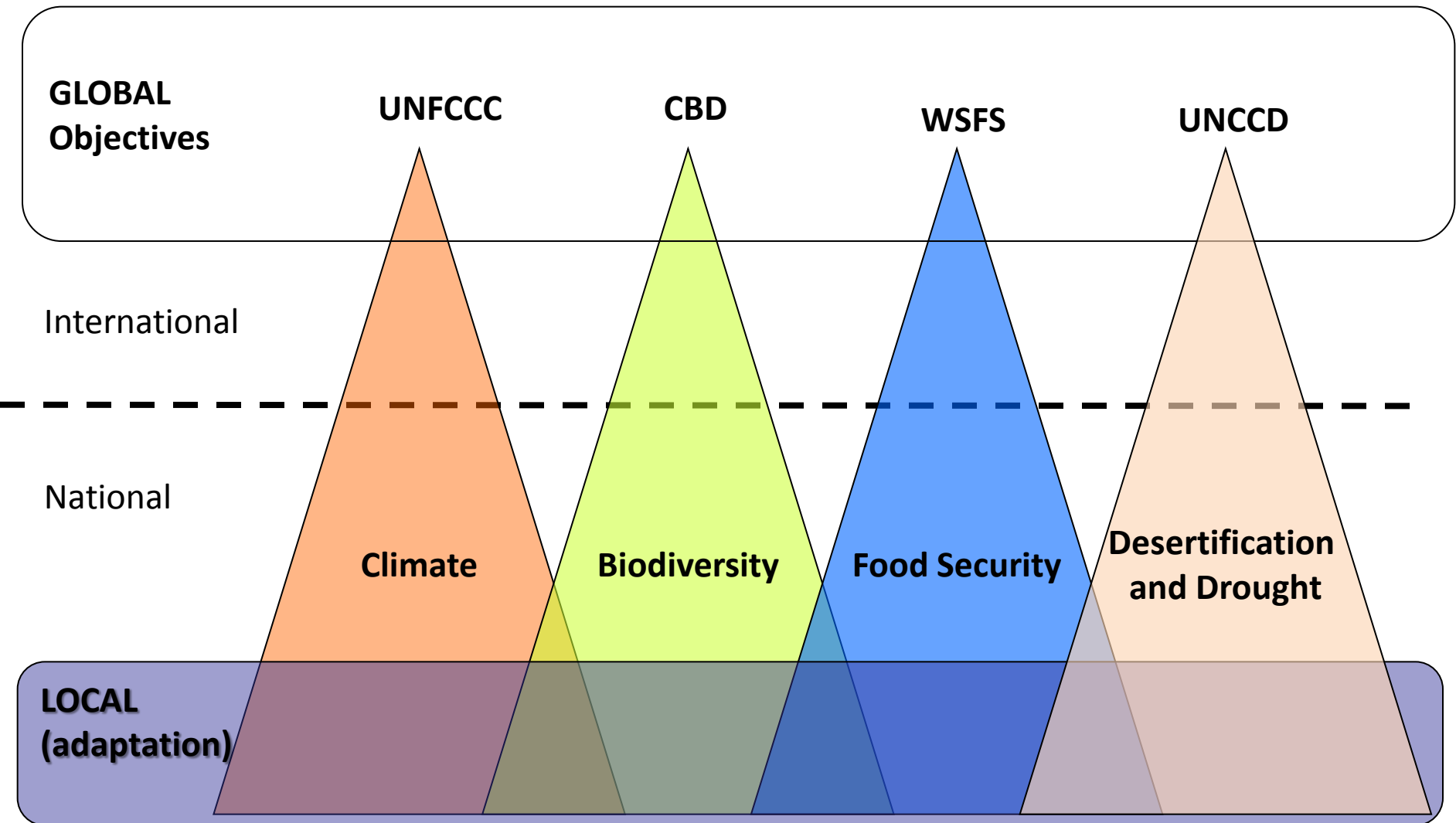
The Background

- Law on Climate Change. June 2012: INE => INECC
 - <http://www.diputados.gob.mx/LeyesBiblio/pdf/LGCC.pdf>
- National Climate Change Strategy. June 2013
 - <http://www.encc.gob.mx/documentos/estrategia-nacional-cambio-climatico.pdf>
- Special Climate Change Program. April, 2014.
 - http://dof.gob.mx/nota_detalle.php?codigo=5342492&fecha=28/04/2014
- **iNDC. March, 2015**

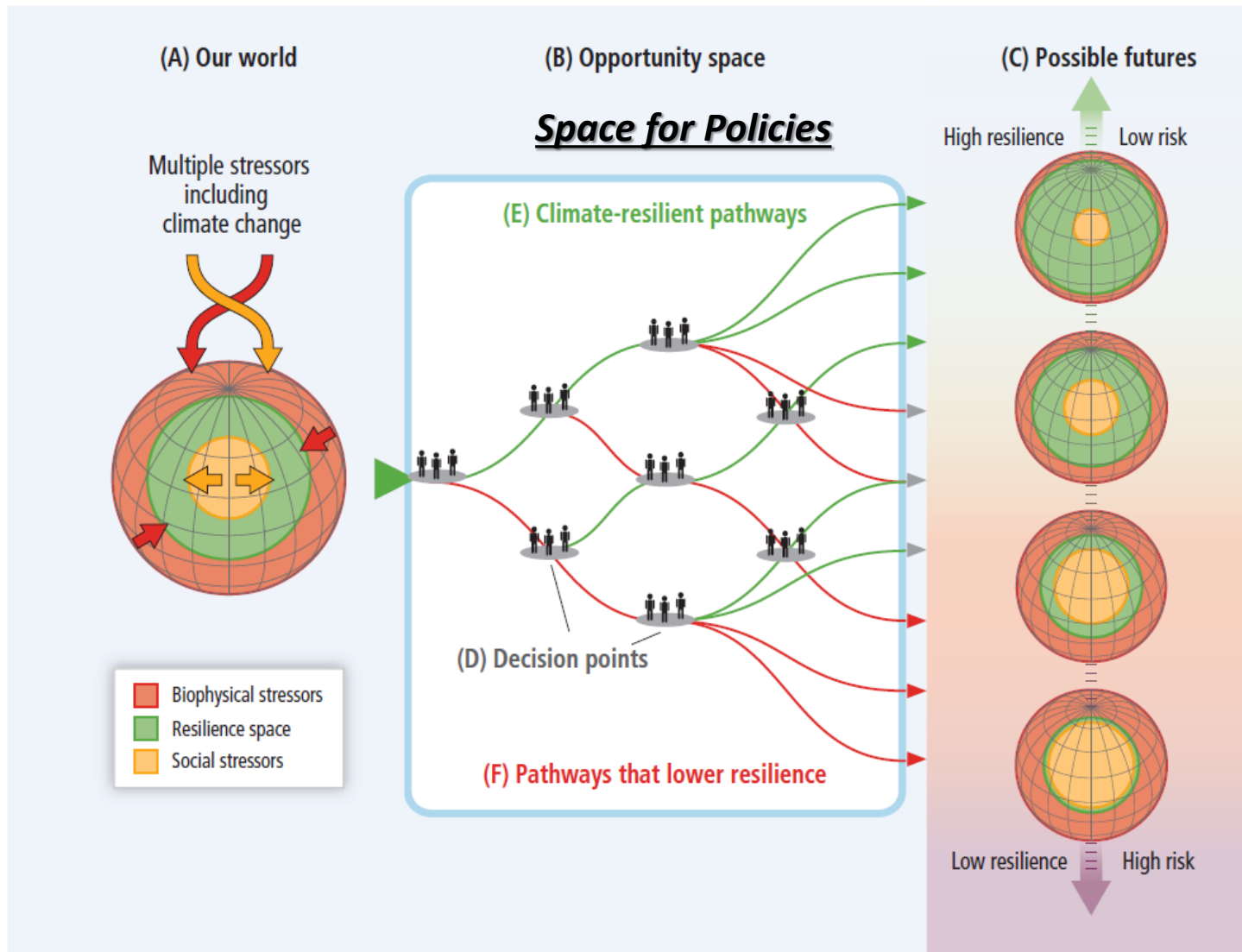
INECC. Our Mission:

*Generate and **integrate scientific and technical knowledge** and increase qualified human capital for the formulation, management and evaluation of **public policies** leading to environmental protection, preservation and ecological restoration, green economical growth and climate change mitigation and **adaptation** in country.*

Territorial approach: Sustainable Development



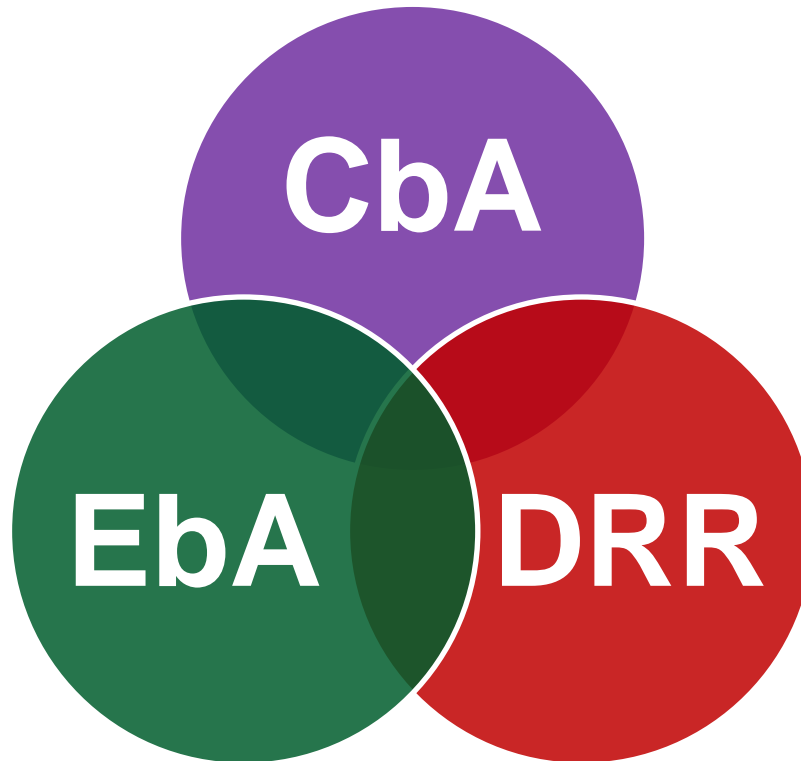
Future Pathways



Burkett, et al, 2014. WGII. Cap.1. *Point of Departure*. 5AR.

IPCC, 2014: WGII. *Synthesis Report*. 5AR.

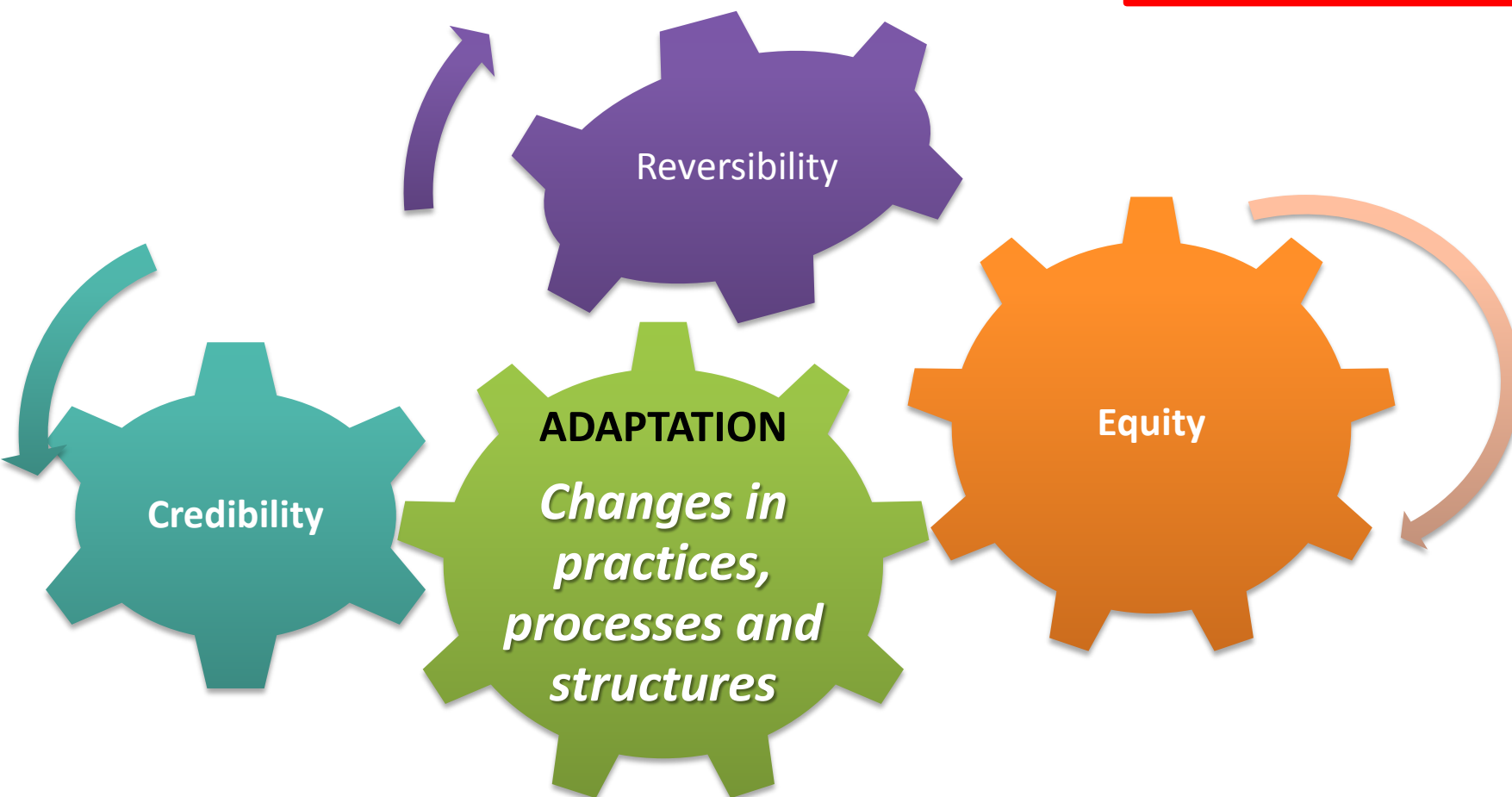
Approaches for adaptation



- **EbA**: Ecosystems based Adaptation. **CbA**: Community based Adaptation.
DRR: Disaster Risk Reduction.

Some Attributes of Adaptation Measures (and Synergies with Mitigation)

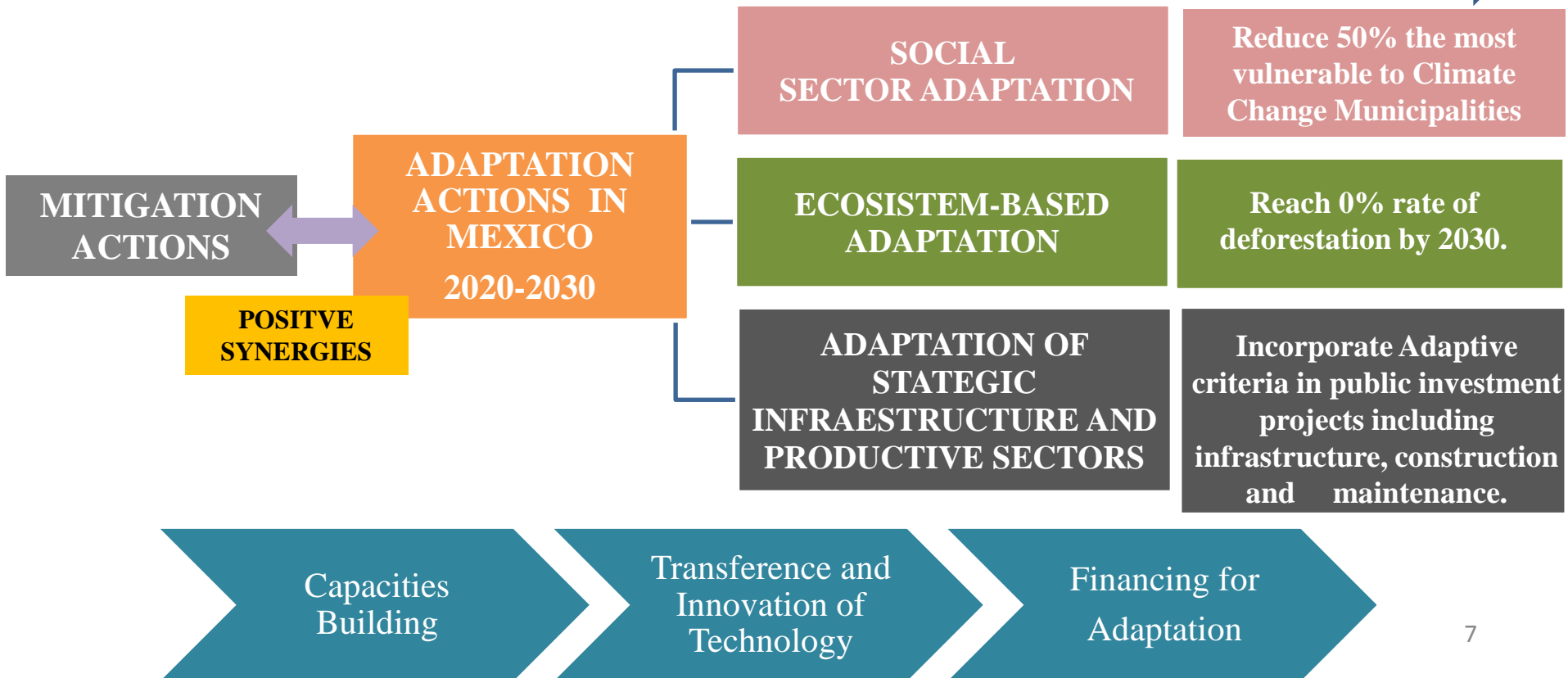
prioritization



ADAPTATION

- Mexico's geographical features place it as highly vulnerable country to the adverse effects on climate change
- Mexico's government consider the adaptation on climate change is a priority to reduce the country's vulnerability

Approaches: Gender equality and Human Rights





ADAPTATION TO CLIMATE CHANGE

SOCIAL SECTOR

Reduce by 50% the number of most vulnerable municipalities to climate change

- Include a climate, gender and human rights approach in all of the risk management instruments
- Increase financial resources for Disasters prevention vs. Disasters attention
- Establish regulations for land use in risky areas
- Integrated watershed management to guarantee access to environmental services, including water supply
- Ensure social participation and training in social adaptation policy

ECOSYSTEM-BASED ADAPTATION

Achieve a 0% deforestation rate in 2030

- Implement strategic reforestation, to promote and ensure the functionality of the watersheds and the biodiversity of native species.
- Increase ecological connectivity and carbon sequestration through conservation and restoration
- Increase carbon sequestration and coastal protection through conservation of coastal ecosystems
- REDD+ action synergies
 - —Ensure the integrated water management in its various uses (agricultural, ecological, urban, industrial, domestic)

STRATEGIC INFRASTRUCTURE AND PRODUCTIVE SYSTEMS

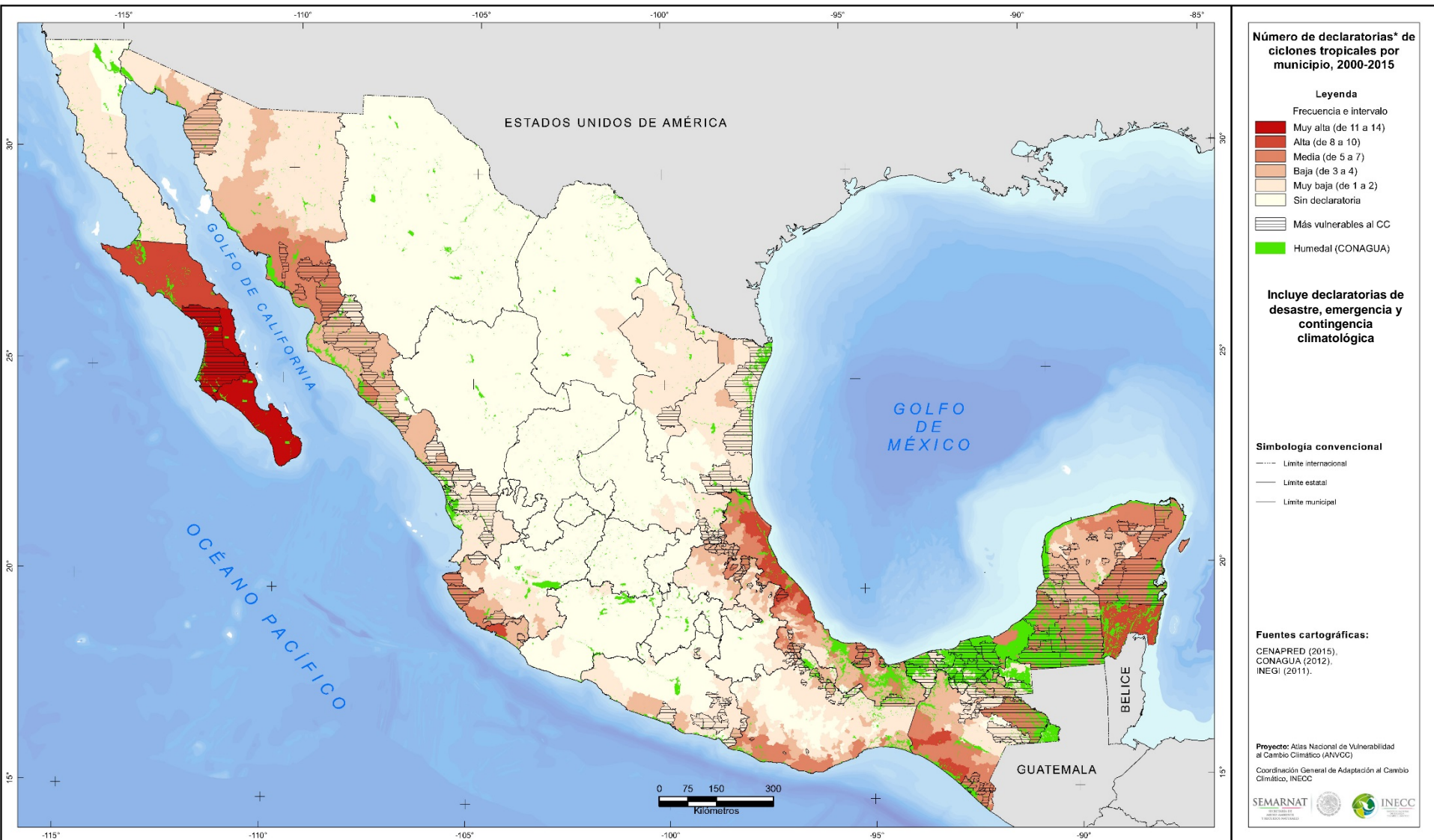
Install early warning and risk management systems in all three government levels

- Guarantee and monitor industrial and urban **waste water treatment** in settlements larger than 500,000 inhabitants
- Ensure strategic infrastructure security
- Include climate change criteria in agricultural and livestock programs
- Apply the regulation on environmental protection specifications and adaptation to the adverse effects of climate change in the planning, design, construction, operation and abandonment of tourism facilities in coastal ecosystems.
- Incorporate adaptation criteria in public investment projects that take into consideration construction and infrastructure maintenance

Example 1.

Wetlands and Climate Change.
National Level

Number of Disasters Declarations for Tropical Hurricanes per municipality (2000-2015), Most Vulnerable Municipalities to Climate Change and Wetlands in Mexico.



Under construction



Inter-agency coordination platform

Conservation, restoration and sustainable use of wetlands in Mexico



Objective

Prioritize areas to allocate and align federal efforts to conserve, restore and promote the environmental services derived from the wetlands in Mexico

Structure

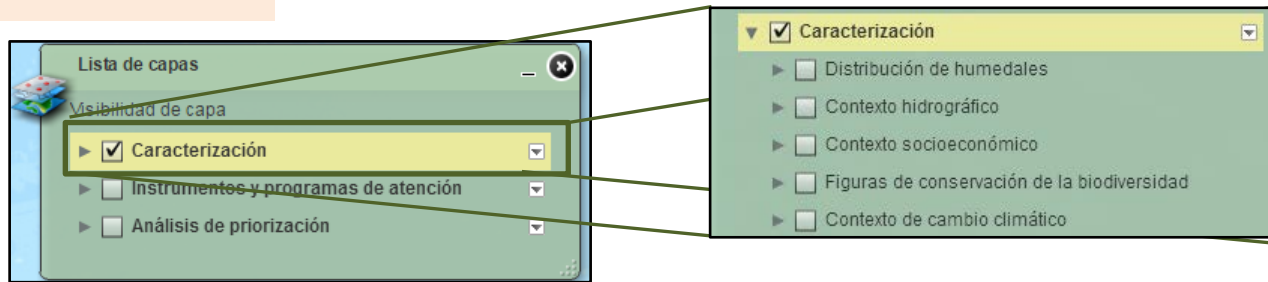
Characterization

Federal instruments and programs to conserve the wetlands

Prioritization to allocate federal efforts to conserve wetlands

Under construction

Characterization



Wetland distribution

- National wetlands inventory
- Hydrophilic vegetation
- Priority sites for mangrove restoration
- Mangrove distribution (2010)

Hydrographic context

- Main rivers
- watersheds
- Water bodies
- Hydrologic regions
- Precipitation
- Aquifers

Socioeconomic context

- Marginalization by localities near the wetlands
- Urban localities

Biodiversity conservation instruments

- Important Bird Area (IBA)
- Epicontinental aquatic priority sites for conservation
- Marine priority sites for conservation

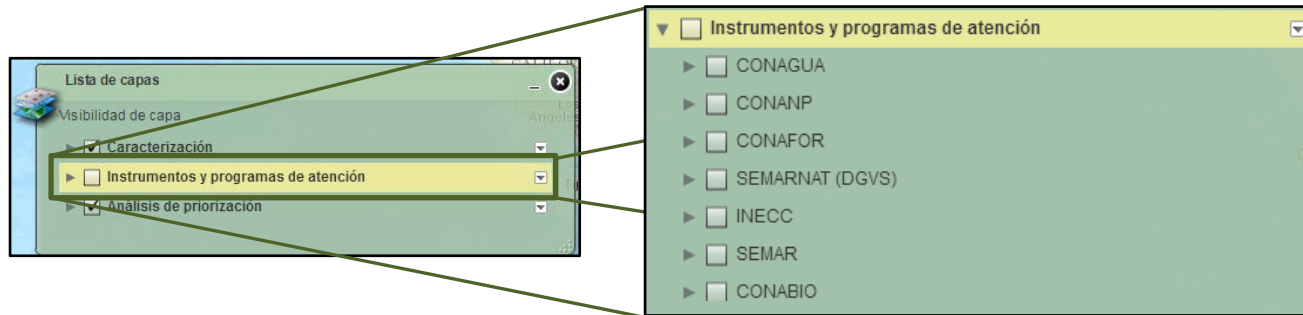
In the Context of Climate Change

- Most vulnerable municipalities
- Declaratory of disasters

- Temperature anomalies in watersheds
- Projections of changes in bioclimatic conditions for the distribution of wetland

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Federal instruments and programs for wetlands conservation



CONAGUA
COMISIÓN NACIONAL DEL AGUA

- Water reserves 2016-2018

 **CONANP**
COMISIÓN NACIONAL DE ÁREAS NATURALES PROTEGIDAS

- Natural Protected Areas
- RAMSAR sites

 **CONAFOR**
COMISIÓN NACIONAL FORESTAL

- Payment for Environmental services

SEMARNAT
SECRETARÍA DE MEDIO AMBIENTE Y RECURSOS NATURALES

- Management units for the conservation of wildlife (UMAs)

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- Adaptation of coastal wetlands of the Gulf of Mexico

SEMAR
SECRETARÍA DE MARINA

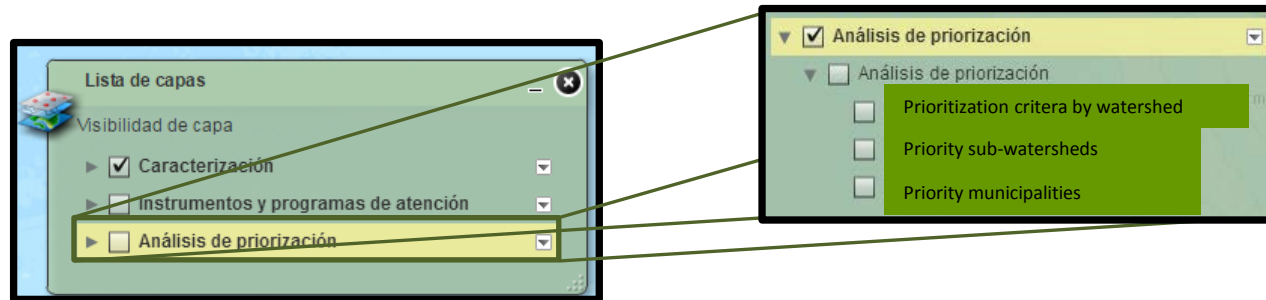
- Program for reforestation, restoration and protection of the mangroves

 **CONABIO**
COMISIÓN NACIONAL PARA EL CONOCIMIENTO Y USO DE LA BIODIVERSIDAD

- Priority sites for mangrove restoration

Under construction

Prioritization to allocate federal efforts to conserve wetlands



❖ Priority subwatersheds to allocate conservation efforts in the coastal wetlands in Mexico



❖ Priority municipalities to allocate conservation efforts in the coastal wetlands



Under construction

In this example

- An instrument that can support decision making for:
- Ecosystems based Adaptation
- Risk Reduction
- Synergies with Mitigation: *CO2 and Blue Carbon.*

Example 2.

Wetlands and Climate Change.
Regional and Local Level

Pilot Project in Cárdenas, Tabasco

Palafitos



DRR

CbA

Mangroves Reforestation



EbA

CbA

DRR



Proyecto de adaptación de humedales costeros del Golfo de México ante los impactos del cambio climático GEF 2011-2016

Sitios piloto:

- Río Papaloapan-Laguna de Alvarado, Veracruz.
- Sistema lagunar Carmen-Pajonal-Machona, Tabasco.
- Punta Allen, Reserva de la Biósfera Sina Ka'an, Quintana Roo.

Approaches:

- EbA
- CbA.
- RRD



Carbon sequestration mangroves (preliminary results)

Type of mangrove	Wood (t/ha ⁻¹)
Tropical wet	86.6

CCA, 2015

Tipo de vegetación	(t/ha ⁻¹)
Mangroves	106.1

Segura-Castruita et al, 2005

Estado	Soils (t/ha ⁻¹) (1 m depth)
Veracruz	200 – 250
Tabasco	470

Moreno-Casasola, 2015

In coral reefs

Arrecife coralino	2.3 t/ha ⁻¹
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Calderón-Aguilera et al., 2007

AbE Actions :

- Reforestation: 25 Ha mangroves in Veracruz and 25 Ha in Tabasco.
- Reforestation riparian habitat: 5 Ha in Veracruz and 5 ha in Tabasco.
- Restoration: 3,500 m² of coral reefs.
- Restoration of water flow: mangrove recovery in 450 Ha.

Associated Mitigation actions:

- 25 Ha of mangrove Veracruz = 106.6 to 336.6 t/ha⁻¹
336 = soil + wood
- 25 ha of mangrove Tabasco = 106.1 to 556.6 t/ha⁻¹
556.6 = soil + wood
- 0.35 ha of coral reef = 0.805 t/ha⁻¹

Still need to quantify: 10 Ha of riparian vegetation, recovery of 450 Ha of mangroves after restoration of water flow

Reversibility?



In this example

- EbA, CbA, and RRD:
- Include the attributes: Reversibility, Credibility, and Equity,
- ... And has Synergies with Mitigation.

GRACIAS