Enhancing Mexico's Wealth by Investing in Natural Capital.

An Application of the Integrated Economic-Environmental Model (IEEM)

Onil Banerjee, Martin Cicowiez and Renato Vargas with:
Juan Manuel Torres Rojo, Monica Lopez Conlon, Bram Edens, Elsa Marcela Begne De Larrea, César Edgardo Rodríguez Ortega ET AL.

Forum of Experts on SEEA Ecosystem Accounting
December 7, 2021

THE IEEM PLATFORM VALUE-ADDED

- A dynamic **economy-wide** CGE model for future-looking scenario analysis of public policy/investment. "What if…?" policy questions.
- Integrates SEEA CF: Natural Capital (NC) and market Ecosystem Services (ES). Includes natural resource-specific modeling modules.
- IEEM and Ecosystem Services Modeling (IEEM+ESM): spatial land use and non-market ES.
- Standard economic indicators + NC, ES and wealth metrics. Enables engagement with Min. of Finance, Central Banks, others- we speak the same language.

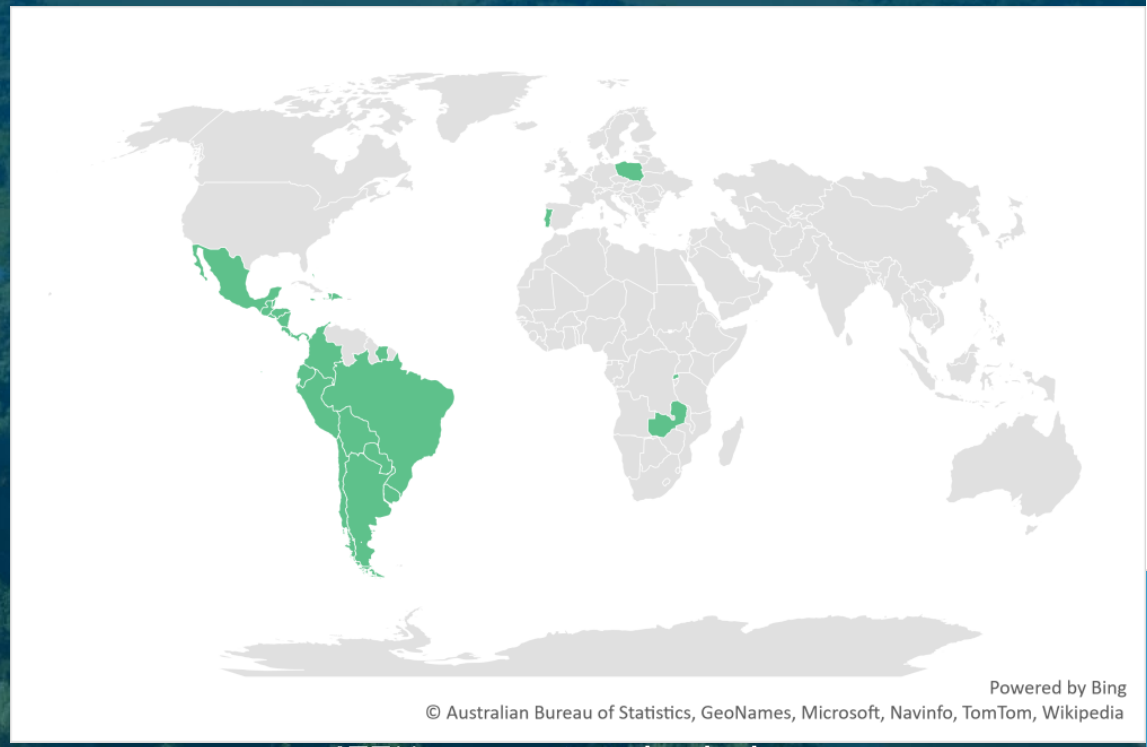
NATURAL CAPITAL

MANUFACTURED CAPITAL

HUMAN CAPITAL

OPEN IEEM PLATFORM ONLINE DEBUT DECEMBER 21, 2021

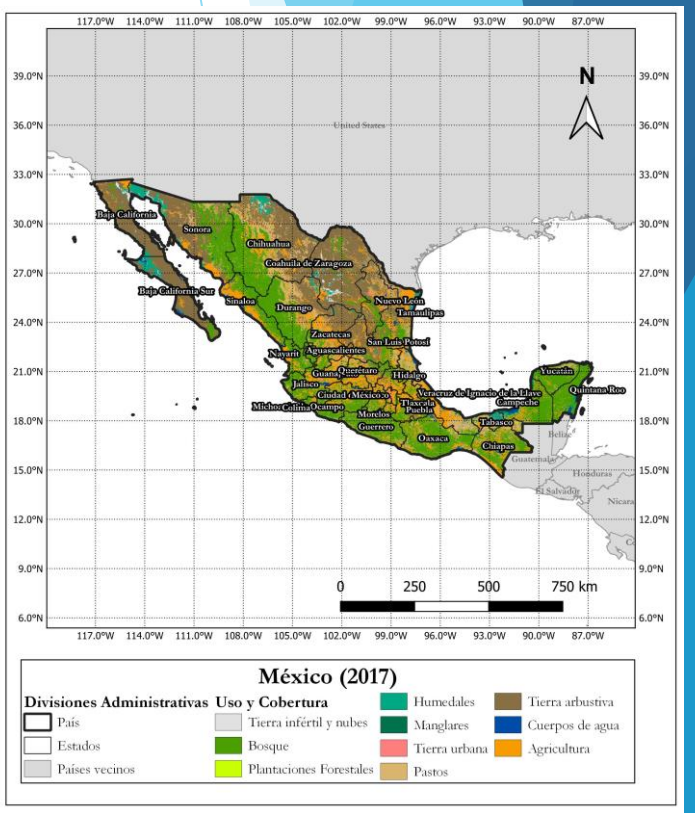
https://openieem.iadb.org/



IEEM countries shaded green.

PARTICIPATIVE SCENARIO DESIGN

- Stakeholder consultation to identify policy instruments for conservation and sustainable management. Types of initiatives included REDD+, restoration, PES, SFM, bioeconomy, research and extension, irrigation, infrastructure, and others.
- Process led SEMARNAT's Environmental Planning Group + NCAVES support: CONABIO, CONAFOR, CONAGUA, CONANP, INECC, IMTA, DGPE, DGVS; SADER and SHCP.
- Selection of instruments based on relevance to environmental sector, data availability, and opportunity to enhance or reinforce policy.



SCENARIOS

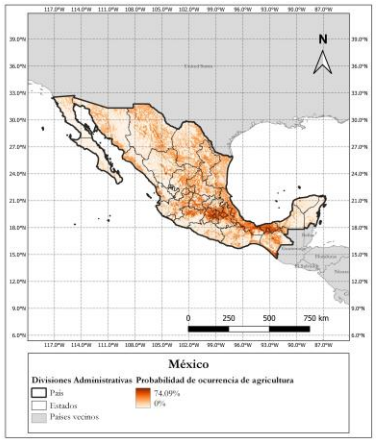
1. **Payment for Ecosystem Services (PSA).** Conservation. 1,300,348 ha of PES between 2020-2024; 0.5 ha avoided deforestation; funded by public sector efficiency gains.
2. **Sustainable Forest Landscapes (ISFL).** Reduce emissions from AFOLU. 44,000 ha of silvopastoral systems and 14,102 ha of restoration between 2020 y 2024; 50% increase in productivity; funded by efficiency gains.
3. **Environmental Management Areas (UMAs).** Sustainable use area compatible with conservation. 35 million ha of UMAs between 2020 and 2024; increased hunting revenues on 25% of the UMAs; funded by efficiency gains.
4. **COMBI:** All of the above scenarios run jointly.

NATURAL CAPITAL

MANUFACTURED CAPITAL

HUMAN CAPITAL

IEEM+ESM WORKFLOW



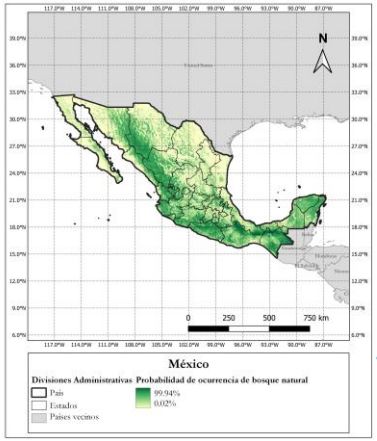
Policy question: Conservation in Mexico

Calibrate IEEM

Run BASE + scenarios in IEEM

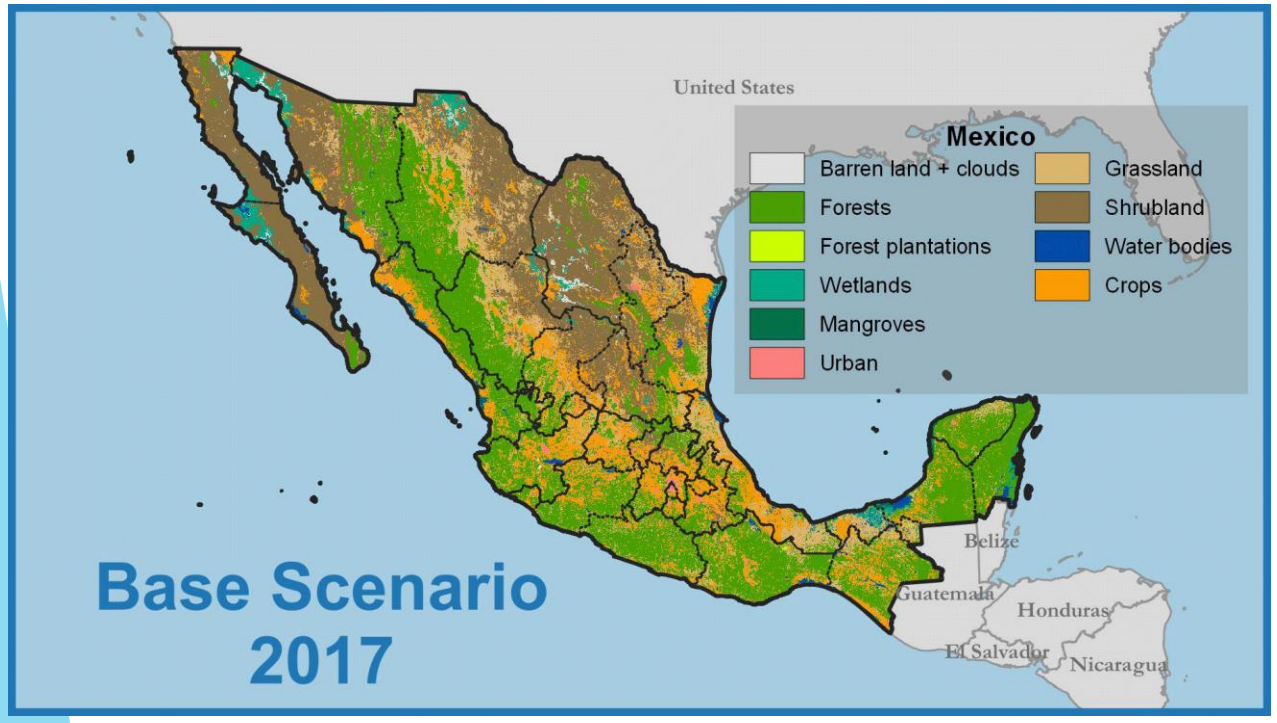
Spatially attribute LULC change, Dyna-CLUE

Model ES with InVEST and IEEM+ESM data packets



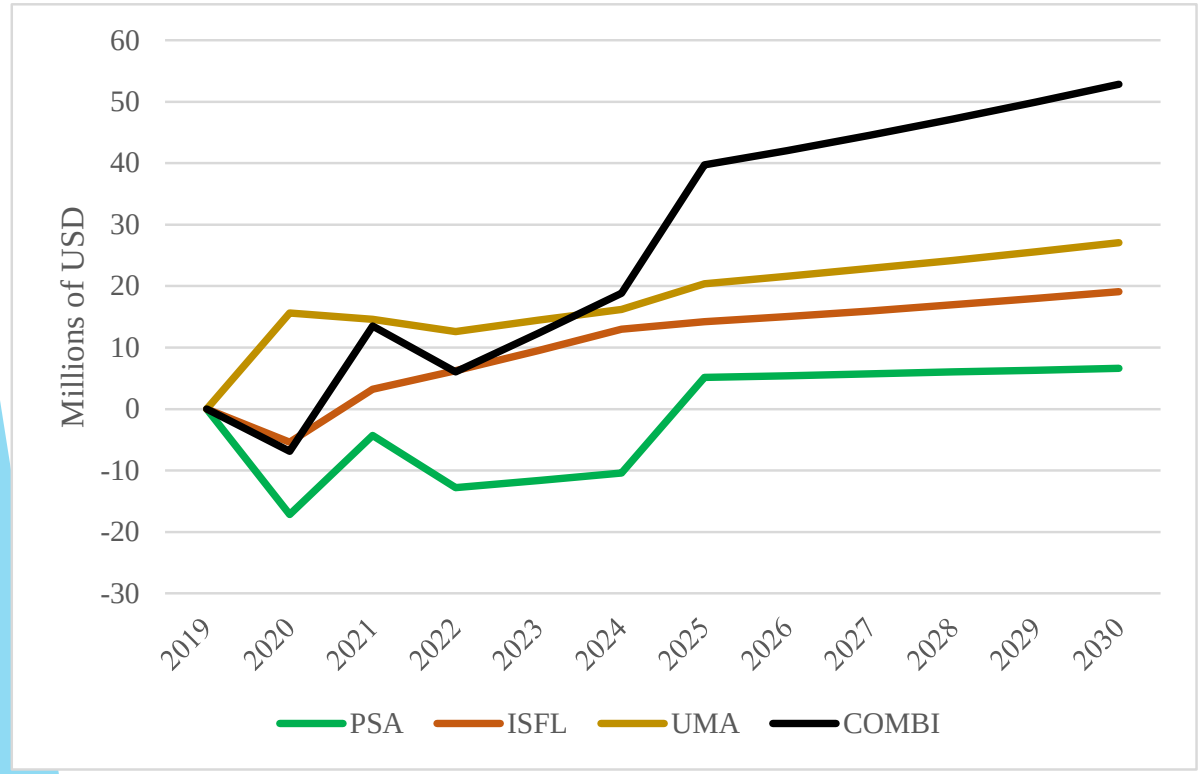
RESULTS: LAND USE LAND COVER

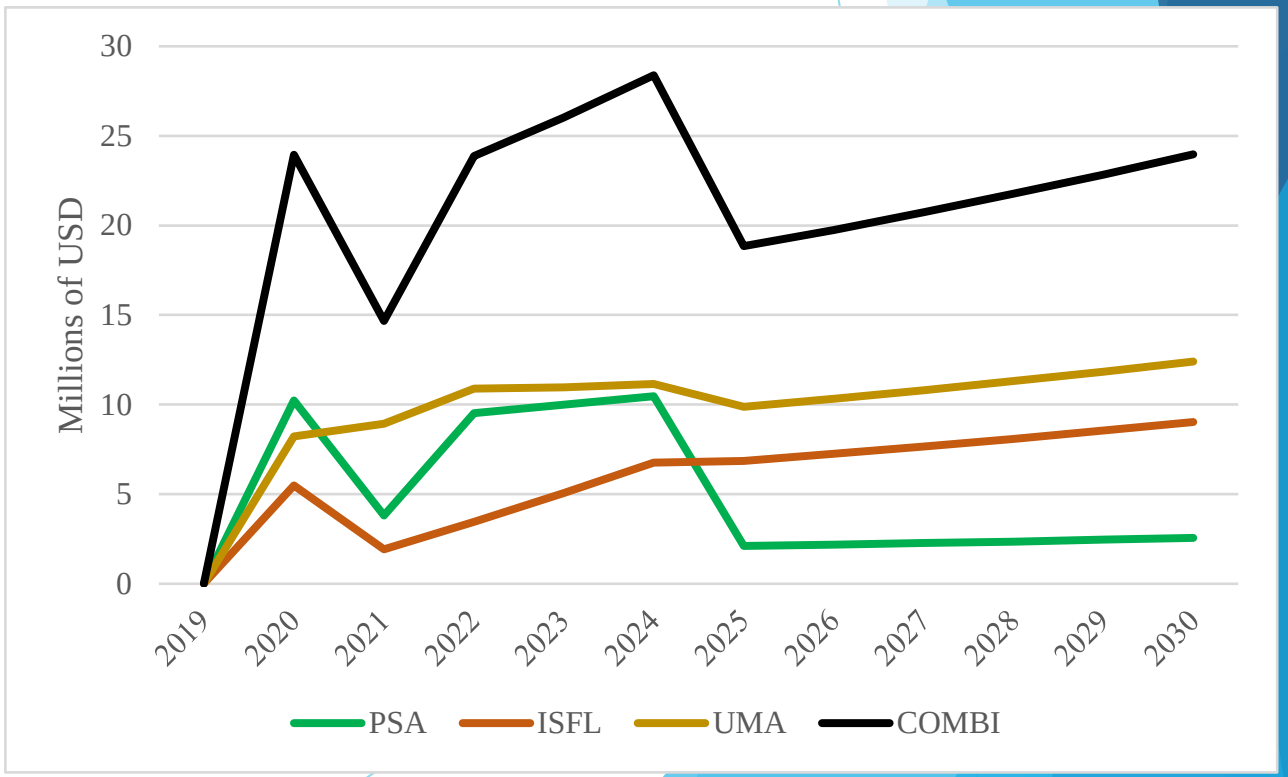
- Land Use Land Cover (LULC) change modeling with IEEM-enhanced Dyna-CLUE model.



RESULTS: ECONOMY

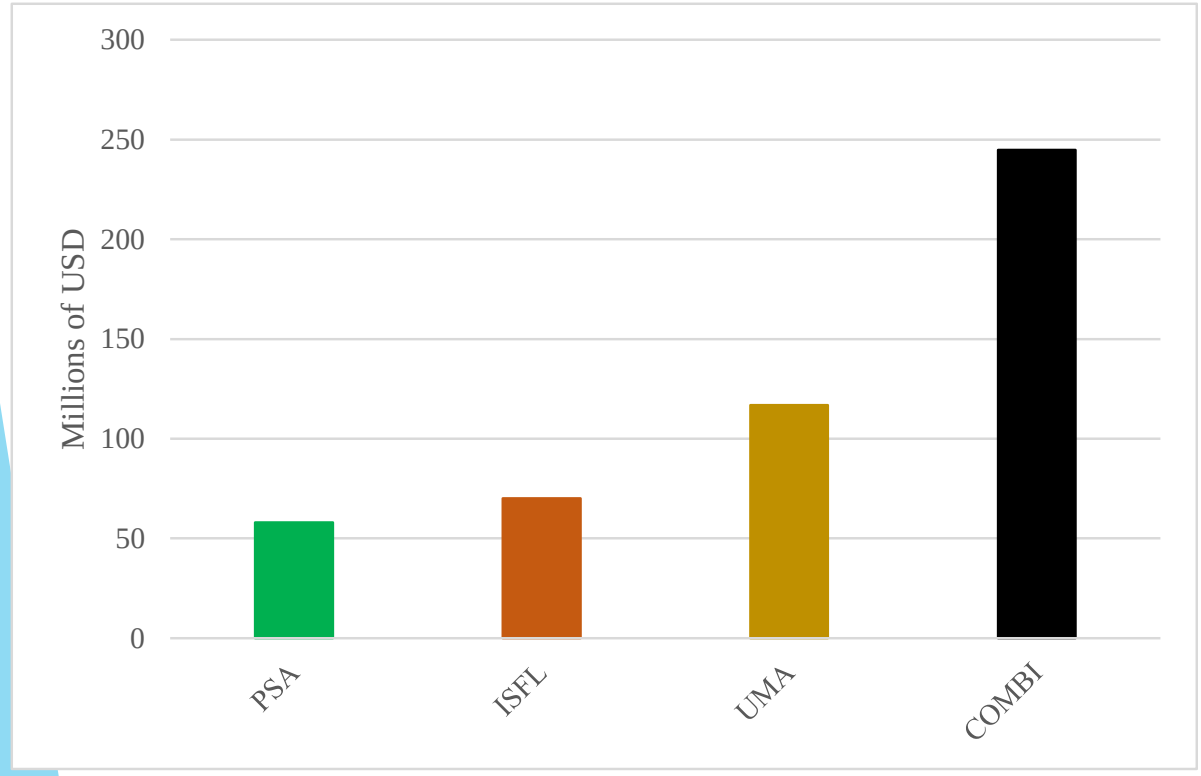
- Gross domestic product (left) and wealth (right).





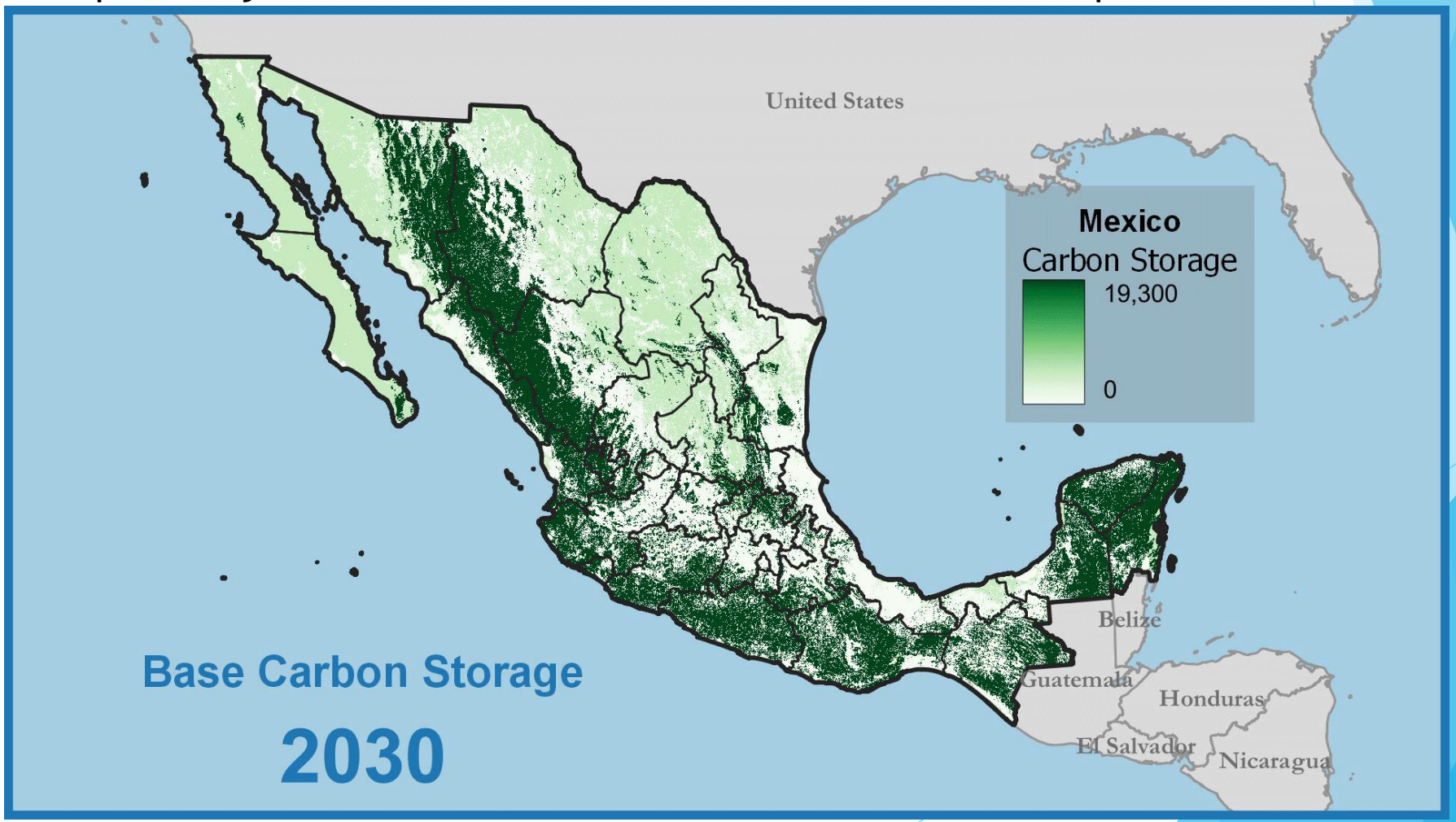
RESULTS: ECONOMY AND SOCIETY

- Cumulative wealth (left) and poverty (right).



RESULTS: ENVIRONMENT

- 2.56% increase in carbon storage with policy intervention. Ecosystem services modeled with the Natural Capital Project's InVEST suite of models and IEEM+ESM datapackets.



RESULTS: ENVIRONMENT

- 5.6% less soil loss with policy intervention. Ecosystem services modeled with the Natural Capital Project's InVEST suite of models and IEEM+ESM datapackets.

KEY MESSAGES

- The positive results are driven by four main factors:

1. Increased productivity of silvopastoral systems;
2. Enhanced efficiency in use of public resources;
3. Additional revenues from UMAs;
4. Avoided deforestation in the case of PES increases stocks of natural capital and ecosystem services flows, which result in gains in wealth.

Valuing Natural Capital for Evidence-based Public Policy and Investment Design

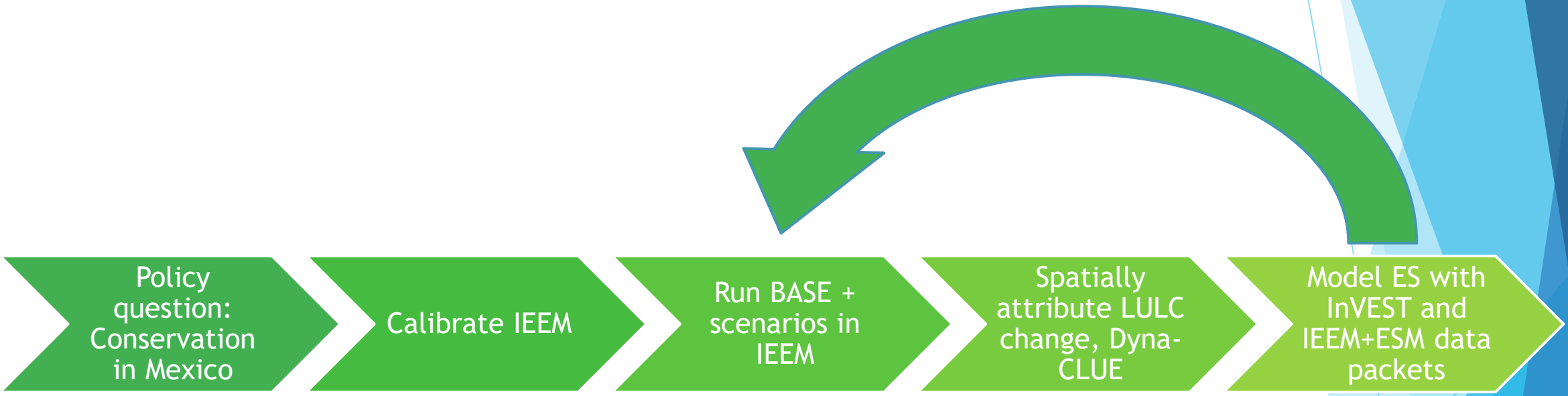
For more information on the IEEM Platform Project, contact:

Onil Banerjee

ONILB@IADB.ORG

202-615-0603

NEXT STEPS



- Integrate feedbacks between changes in ecosystem service flows and the economy; iteration between models every five-year period.