



## Innovative Approaches to Researching Transdisciplinary Teamwork for Effective Science-Policy Translation in the Americas



Instituto de Investigaciones en Ecosistemas y Sustentabilidad UNAM Campus Morelia Julio 2015

### **Presentation Outline**

onliges empirically challenges on the consumption action knowledge outcomes activities proposal products understanding change outcomes significant food based months insecurity biodiversity teamwork pathways generating empirical socio urgent panels. The products of the panels of the panels. The panels of the p

**TERAA Overview and Context** 

Methods of data collection

**Research findings** 

Next Steps

Questions, Disscusion, and Feedback



Science Visible Solutions

#### **Confront global challenges**

#### Premises



- 1) Science as practice
- 2) Team work (Interdisciplinary and Transdisciplinary)
- 3) Individual traits

4) Outcomes and their impact on society

#### Effective teamwork for action

 Individual traits (Hilgard, 1980; Kozlowski & Ilgen, 2006)

> Think (cognitive) Feel (affective) Do (conative)

Levels of Outcomes
 (Olsen, 1997, 2003)

Scientific Impact (articles, thesis) Policy Impact (policy documents) Visible solutions (on the ground actions)



## **Research questions**

- 1) Which team member attributes/characteristics lead to ID and TD team research outcomes that successfully bridge the knowledge-action gap?
- 2) How do individual team member attributes interact to influence ID and TD team research outcomes?



## The Research



- Mixed Methods Parallel Design
  - Survey (n=51)
  - Interviews (n=20)
  - Social Network Analysis (SNA) (n= 28 documents)
  - Self-reflections
  - Document Analysis
  - Scenarios
  - Field Observations



# **Study Sites**

## 22 ID & TD Projects

Ongoing and Completed

- Seed Grants,
- Small Grants,
- Collaborative Research Networks



- 51 junior and senior scientists and policy makers
- 17 countries

#### **Instrument design** (Survey & Interview questions)



#### Extensive literature review (individual and collective level)

Dimension	Attributes	Item example
Cognitive	Mental models, <i>learning</i>	Learning: I know the tools and materials, resources that other team members require for conducting their work.
Conative	Incentive, <i>motivations</i>	Motivation: I prioritize team meetings of this project over other commitments.
Affective	Affect-based trust, <b>backup</b> <b>behavior</b>	Backup Behavior: Team work continues if a member is sick or absent.

### **Instrument design** (Survey & Interview questions)

Ι.	ADDRESSING THE SCIENCE-POLICY GAP & EFFECTIVE ACTION	<ul> <li>Identify use of knowledge for "effective action" (Olsen et al. 2003).</li> <li>Three orders of outcomes and performance.</li> </ul>
11.	PERSPECTIVES OF ID/TD PROJECTS & TEAMWORK EXPERIENCES	<ul> <li>Team structure dimensions</li> <li>Team composition</li> <li>Perspectives of teamwork priorities</li> </ul>
111.	SCENARIOS	<ul> <li>Places the participant in a dynamic team situation.</li> <li>Explore sensitive matters in a clear, less personal, less threatening way.</li> <li>Use of "Vignettes" (Lavakras, 2008).</li> </ul>

#### Instrument design (Scenarios and Networked related activities)



#### Scenarios: Diagrams of team organization and conflict resolution



Networked related activities: Products and distribution of tasks

# **Research Findings**

## **Research Findings & Supporting Evidence**

	Finding	Supporting Evidence
1.	Affective and cognitive dimensions were identified as important for effective teamwork across all three levels of outcomes.	Surveys Interviews
2.	Science outcomes are prioritized over policy and SES outcomes due to institutional constraints, time constraints, and financial constraints.	Interviews Surveys
3.	Team members recognize the need to bridge the natural and social sciences, but in practice tend to be unable to achieve this integration.	Surveys Interviews Social Network Analysis
4.	Long-term, engaged interactions in interdisciplinary team research may contribute to cognitive transformation and the emergence of conceptual innovation	Surveys Interviews Social Network Analysis

Not Important



# 首的

#### **Face-to-Face Interactions:**

"Las reuniones cara a cara fueron fundamentales para cumplir con los objetivos del proyecto. Nos ayudaron a aclarar desde definiciones conceptuales, a establecer y depurar el acercamiento metodológico y definir las actividades de obtención de información...nos ayudaron a establecer acuerdos de forma rápida y a cumplir los objetivos comunes."

"Person-to-person meetings are very important because you can clarify missing points. You can let the people ask and talk and ask their questions. And you can see on their faces if your answer is satisfying them or not. So the *in-person interaction is a fundamental thing*. It makes a huge difference."



#### Trust

"Shotgun marriages don't work... If you want to build a strong research team, then the most successful ones seem to have previous history. You can't say, take this group and this group and put them together and expect them to do something. You've got to build the links, you've got to build the trust between the groups."

#### Empathy

"My colleagues, they like the way I behave, somehow, and so I can help in trying to solve problems and to answer some doubts....I have this skill, empathy or easy communication, so I can help to drive the project and with the development of all of the activities."

#### **Cognitive Enablers:**

Not Important
 Less Important
 Important
 Very Important





## Communication: Creating a Common Language

"The obvious problem is one of language. And its not English or Spanish or French or whatever. It's the fact that most disciplines hide behind a vocabulary where certain words have meaning."

"Establecer desde el principio un esquema de "lenguaje común" para el proyecto para asegurar de que siempre se esté hablando y entendiendo lo mismo, sobre todo."

*"El tema de la interdisciplinaridad también es la apertura de actitud. Estar dispuesto a escuchar al otro, y también conversar, y crear puentes. Y eso creo que se ha dado"* 

#### **Cognitive Enablers:**



#### **Epistemological Openness & Learning**

"There is an uneven distribution of knowledge amongst all members, of course, this is natural. But **members have to be open to new ways of producing knowledge**. And if you are talking about the science-policy interface, oh, that puts you in a more difficult context, because as you know science is governed by one rationality and the policy making process by another one, totally different. So, if we are working on the interface, we have to graft different elements from the different fields."

"There is a lack of knowledge for more social science going deep and the approach and methodology and so on. So, people, first of all, **they need to have an interest in learning**. So they have to go through new literature, do some reading, research, find resources available and also sometimes you need support from institutes to do that."

# Finding 2: Prioritization of Science Outcomes



#### **Institutional Constraints:**

"And so, interdisciplinary research runs into the boundaries between disciplines. I mean, one of the points here is that obviously if you are a PhD in a major discipline going for a job, or if you are a young faculty member going for tenure, there are only certain journals that count and these are not necessarily interdisciplinary journals."

"In South America, there are many difficulties in dealing with institutional administration. And somehow, even a lack of support for these cross-disciplinary initiatives. And so, we could **have a** certain disinterest from some institutions. Not from the researchers, but from their institutions."

# Finding 2: Prioritization of Science Outcomes



#### **Financial Constraints:**

"And of course one important thing that I should mention is the availability, real availability, in terms of work that you can have for this project. We are working on our own companies and institutions...You are working as a voluntary guy in this project. You are tired and you come back from work and you have to think about this project. And **you are not paid** for this project."

"We do have a stakeholder advisory team. But, its not super active because **we can't afford to move them to any of the meetings**. It would be nice if we could. It would be great if we could mix them up. So none of them know each other. They are all from different sites."

# Finding 2: Prioritization of Science Outcomes



#### **Time Constraints:**

"Lack of time to meet with the colleagues and we all are very busy. And not only to meet but to do the research, to search for new literature and to dedicate time for this. There is some lack of knowledge regarding the content of the other subjects we are dealing with. I mean, I am out of my field."

"We are finding that [stakeholder engagement process] is really slow."

## Finding 3: Inconsistency in ID/TD Practice

Lack	of	Integration	of	Social	Sciences:
------	----	-------------	----	--------	-----------

"I am really convinced that this social science is important in understanding and coping with global environmental changes. But, there is a need for the integration with the natural science. So, those global environmental changes and climate change has among its causes something related to human activities...I believe that our research can play a social function. "

"I think it is important to build, or to have, these collaborative networks. In order to build the bridge or build more solid bases between social and natural science, **and not only talk**, you know what I mean. "



## Finding 3: Inconsistency in ID/TD Practice

#### Interdisciplinarity as the "Great negotiation table of United Nations":

"They are having many countries together, but each one is defending their own interests. So, this could be a very simple understanding of negotiation between the disciplines. Where each discipline defends its own territory, its budget, its visibility, but it really confirms the barriers among the disciplines. And this can cause a fragmentation of the knowledge. So, I think these intra-transdisciplinarity projects, they have to exchange, cooperate, and seek for a true integration between all the participants, so that the boundaries become more and more invisible, somehow."



# Finding 4: Long-term Engaged Interaction

#### **Cognitive Transformation & Conceptual Innovation:**

"All of these different disciplines, they must interact, and try to modify the way the approaches are being done independently in a way that depends on each other in this newest approach, I would say. So, interaction between all of these disciplines, it is very important and this **should promote an enrichment in each discipline and consequently, a kind of transformation**, not only in the methodologies for doing the research, modifying a few concepts, also using some basic terminology, among others."



# Finding 4: Long-term Engaged Interaction

#### **Cognitive Transformation & Conceptual Innovation:**

"Now, just the whole socio-environmental aspect of it is just fascinating... So, its just kind of interesting to see how things play out in terms of the social structure, the land tenure situation, the environmental regulatory structure and all of these sorts of things. **Trying to put all of these human layers on top of the science, is a new dimension that I am finding very interesting... I mean, I think my objectives and goals have changed because I know a lot more about it now.** Especially the socio-economic and cultural sides of it that I was a little bit ignorant about before. So, that has opened me up to a lot of new ideas that are probably not in the proposal but are more interesting and more important to work on. So, **I think it has evolved quite a bit.** 





Natural Scientist	
Social Scientist	
Engineer	
Interdisciplinary	
Scientist	
Science output	
Policy output	
SES output	

# Future Directions: Development of ABM



# Thank You & Questions



#### **Advisory Committee**

Daniel Stokols Claudia Natenzon Kathleen Halvorsen

Website: http://www.teraa.ei.udelar.edu.uy

#### **Presenters' Contact Information**:

Gabriela Alonso (Canada) <u>galonsoy@ucalgary.ca</u> Lily House-Peters (USA) <u>lilyhp@email.arizona.edu</u> Martin Garcia Cartagena (Uruguay) Michelle Farfan (Mexico) Jeremy Pittman (Canada) Ignacio Lorenzo (Uruguay) Sebastian Bonelli (Chile)



# ABM Development: Global Variables

Parameters	Description	Hypothesized Impact
Train Together	The team members attending inter-disciplinary training together; (Ex: physical scientists trained in social science methods)	Significantly improve: SI; Necessary for: PI and SES-I
Prestige	The previous success of the team's members; team member status in academia	Significantly improve: SI; Necessary for: PI and SES-I
Academic Incentive	Presence of incentives in academic structure; affects academic team members	Necessary for science-impact (SI)
Policy Incentive	Presence of incentives in government or NGO structure; affects practitioners	Necessary for policy-impact (PI) and SES-impact (SES-I)
Face-to-Face Interaction	Team members meet in person at least once per year; ideally linked to building Trust	Significantly improve SI and PI; Necessary for SES-I
Trust	Team members have developed trust each other and feel comfortable interacting	Improve SI and PI; Necessary for SES-I
Previous Experience	Team members have worked together in the past on research projects; attended programs	Improve SI and PI; Necessary for SES-I

# **ABM Development: Scenarios**

Scenario	Variable Values	Impact on Outcomes
Scenario 1	Prestige = False Incentive-Academia = False Incentive-Policy = False Train-Together = False Face-to-Face Interaction = False Trust = False Previous Experience = True	Science-Impact = 0.4 (partial success at each time step) Policy-Impact = 0 (none) SES-Impact = 0 (none)
Scenario 2	Prestige = False Incentive-Academia = True Incentive-Policy = True Train-Together = True Face-to-Face Interaction = True Trust = False Previous Experience = True	Science-Impact = 0.6 (partial success at each time step) Policy-Impact = 0.2 (partial success at each time step) SES-Impact = 0 (none)
Scenario 3	Prestige = True Incentive-Academia = True Incentive-Policy = True Train-Together = False Face-to-Face Interaction = True Trust = True Previous Experience = True	Science-Impact = 0.7 (partial success at each time step) Policy-Impact = 0.5 (partial success at each time step) SES-Impact = 0.1 (partial success at each time step)