RESPUESTA EN CLIMA Y AMBIENTE PARA LA SALUD EN LAS AMÉRICAS
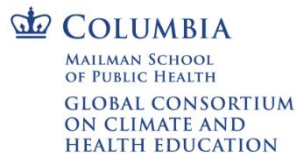
Designing & Implementing Transdisciplinary Research Approaches
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Lily House Peters, Gabriela Alonso Yáñez, Marshalee Valentine, Martin Garcia Cartagena

Learning Objectives

- Describe the stages of transdisciplinary research problem identification, problem structure and problem analysis

- Explain and apply a 'results chain' model to a specific research problem

- Describe a transdisciplinary approach to policy analysis

- Identify opportunities and barriers for the uptake of research into policy

Session 4 Focal Areas

- Key stages of transdisciplinary research problem identification, problem structure, and problem analysis

- Introduce theory of change framework, the "results chain" model and provide concrete examples

- Example of a transdisciplinary approach to policy analysis

- Successful and unsuccessful examples of translating knowledge to policy and action
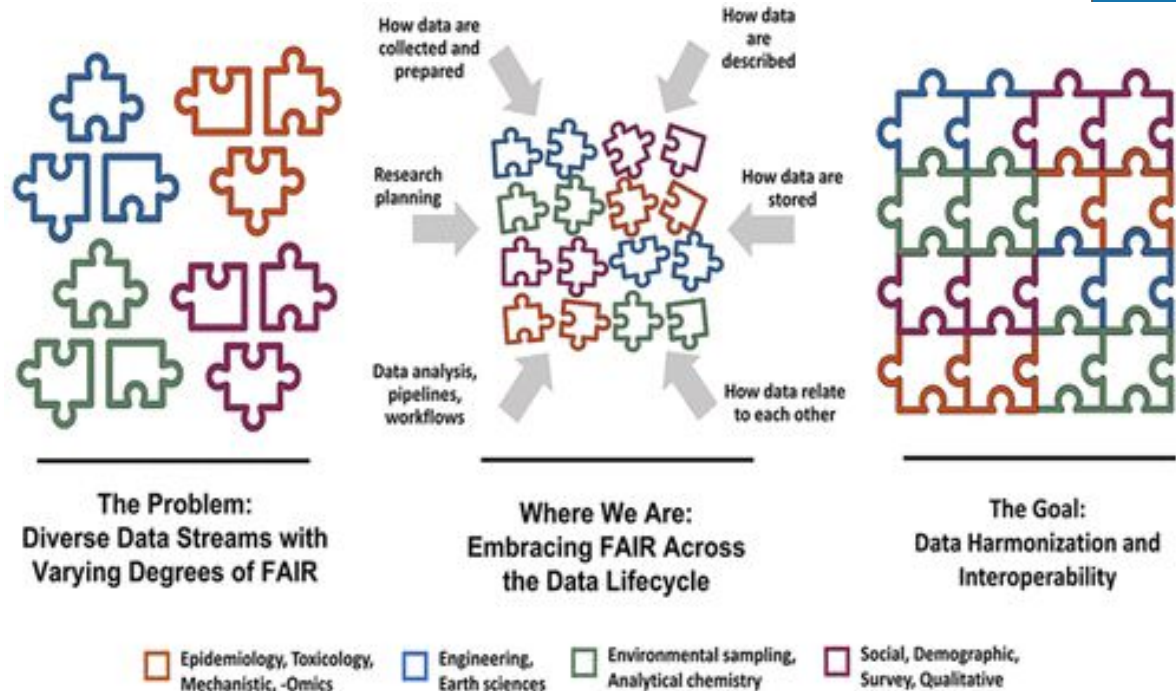
Participant Feedback

Transcdisciplinary Quality Scores
1 (low) to 5 (high)

Legend: 1, 2, 3, 4, 5

- 1 — 2%
- 3 — 9%
- 4 — 24%
- 5 — 65%
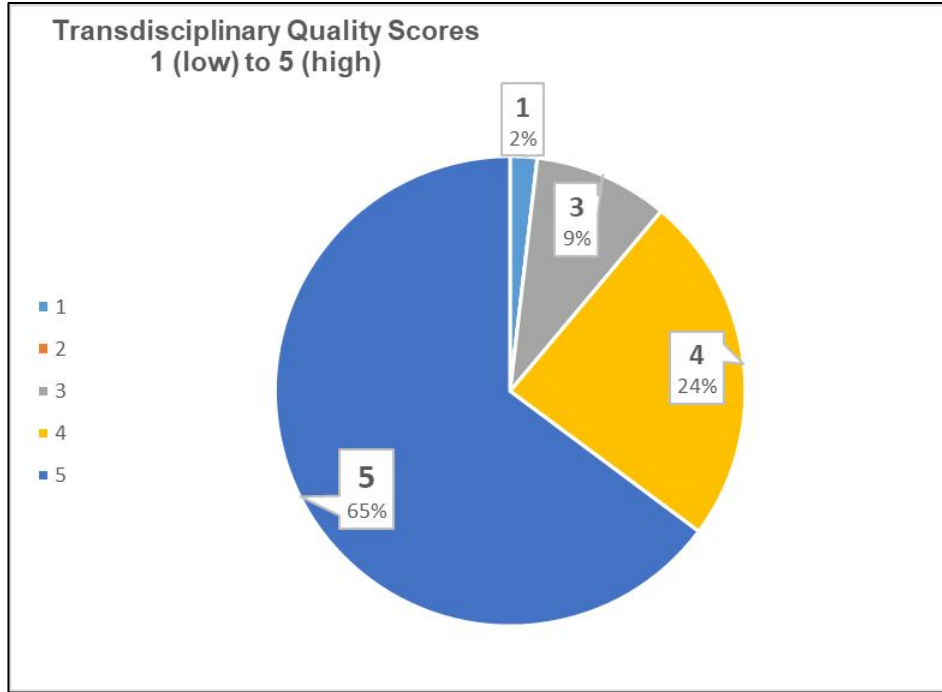
89% of responses were positive or very positive

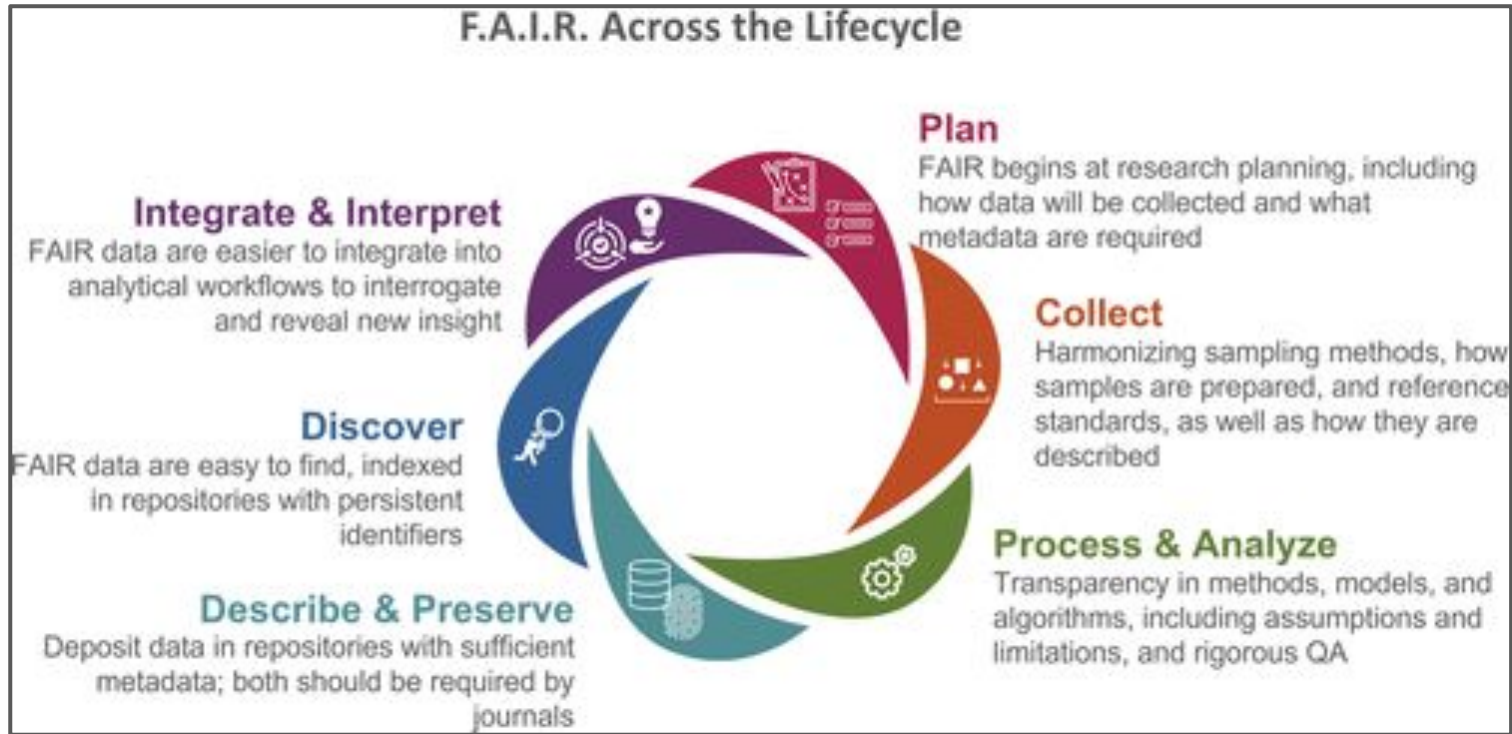**Questions focused on:**

- How to apply TD

- More concrete examples

- How to maintain scientific rigor

- How to balance breadth and depth in TD research

- How to assure participation of non-academic actors

- How to do knowledge co-production with communities

- Methods to achieve a shared language that provides a fruitful interaction between the different disciplines.

Diverse Data Streams in TD Research Data

- Data interoperability is a *key challenge* of transdisciplinary science - diverse methods and data sources produce data that can be difficult to manage and integrate

- FAIR (**Findable, Accessible, Interoperable, and Reusable**) is a tool to improve data interoperability for mixed-methods datasets

- Key to harmonize data workflows, ensure consistent and robust practices in data stewardship (Heacock et al. 2022)

How data are collected and prepared

How data are described

Research planning

How data are stored

Data analysis, pipelines, workflows

How data relate to each other

The Problem:
Diverse Data Streams with Varying Degrees of FAIR

Where We Are:
Embracing FAIR Across the Data Lifecycle

The Goal:
Data Harmonization and Interoperability

□ Epidemiology, Toxicology, Mechanistic, -Omics   □ Engineering, Earth sciences   □ Environmental sampling, Analytical chemistry   □ Social, Demographic, Survey, Qualitative

Implementing F.A.I.R. Data Standards

F.A.I.R. Across the Lifecycle

Plan
FAIR begins at research planning, including how data will be collected and what metadata are required

Collect
Harmonizing sampling methods, how samples are prepared, and reference standards, as well as how they are described

Process & Analyze
Transparency in methods, models, and algorithms, including assumptions and limitations, and rigorous QA

Describe & Preserve
Deposit data in repositories with sufficient metadata; both should be required by journals

Discover
FAIR data are easy to find, indexed in repositories with persistent identifiers

Integrate & Interpret
FAIR data are easier to integrate into analytical workflows to interrogate and reveal new insight

TD Integration Strategy: Boundary Objects

Central to collaborative transdisciplinary work is the critical aspect of common "relevant knowledge", enough to be able to work together and to foster transformative science

Boundary Objects:

- Identify common ground or shared meaning (Star y Griesemer, 1989).

- Are identified through joint work processes

- Improve the possibility and success of cooperative work

- Facilitate disciplinary boundary crossing

- Border crossing involves "negotiating and combining symbolic and syntactic elements from different contexts"(Engeström et al. 1995).
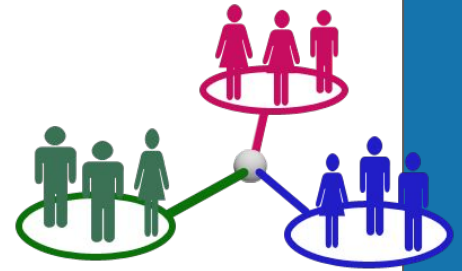
Grounded Example of Boundary Objects

Study Case Focus: integrating local and traditional knowledge systems for improved biodiversity conservation at the local–scale in the Americas
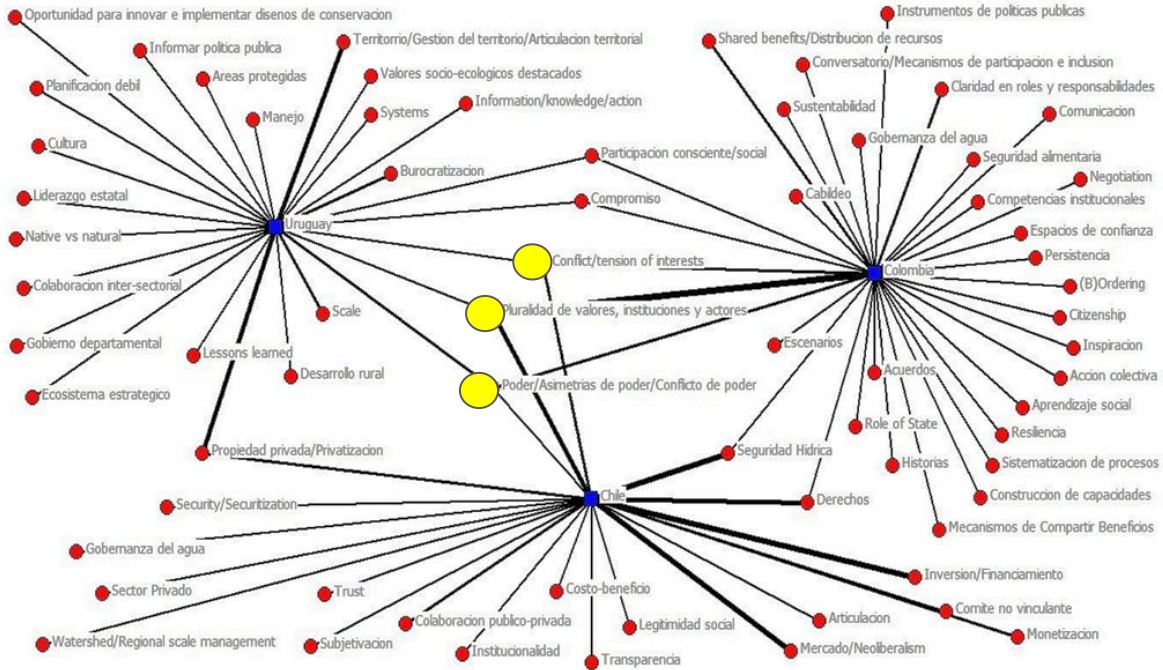
Protocol:

Country-Case Presentations

Task: Identify 3-5 keywords per case
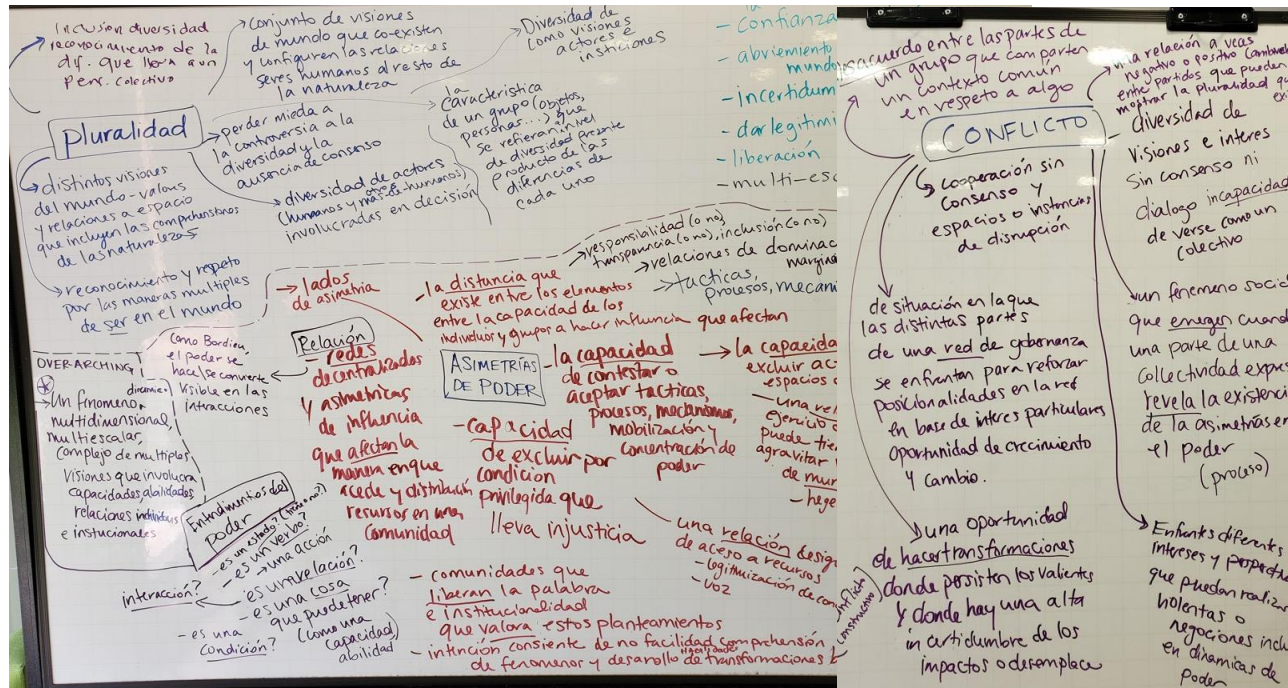
Social Network Analysis of keywords

# Grounded Example of Boundary Objects

Resulting Boundary Objects:

- Conflict

- Power Asymmetries

- Plurality

Zoom Poll

What are key research integration challenges you have experienced?
(Choose up to 2)

1. Managing and integrating diverse data sets

2. Finding common ground

3. Co-designing research questions

4. Developing shared methodologies

5. Maintaining good communication
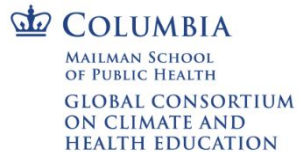
Transdisciplinary Policy Analysis

Zoom Poll

What do you see as key roles of a policy analyst in a transdisciplinary research setting? *(Choose up to 2)*
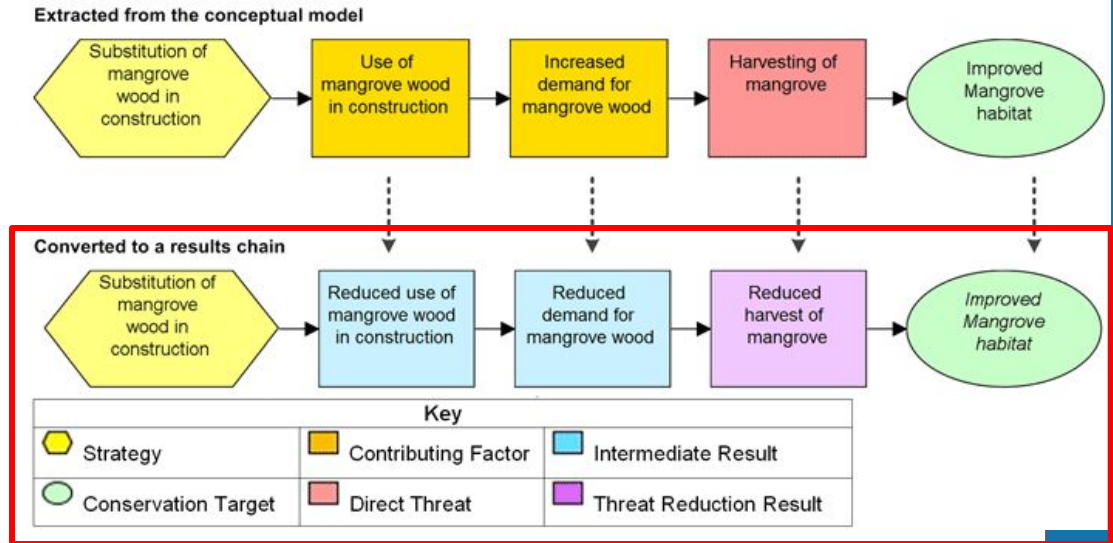
1. Serve as a broker between different bodies of knowledge

2. Serve as a mediator between diverse groups of stakeholders

3. Formulate problems and solutions

4. Democratize the policy-making process and build capacity for broader engagement

5. Serve as an agent for transformative action
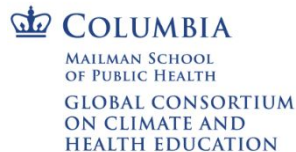
An Important Logic Model: Results Chain

- Guides project implementation *and* is essential for monitoring and evaluation of project outcomes

- In general, a "result" is something that happens or exists **because of something else** that has happened

- In research, development and governance, the *results chain* is a more *nuanced* understanding of different types of 'results'

- The *results chain* distinguishes between five logically connected elements:

    - **inputs**
    - **activities**
    - **outputs**
    - **outcomes**
    - **impact**

Extracted from the conceptual model

Substitution of mangrove wood in construction → Use of mangrove wood in construction → Increased demand for mangrove wood → Harvesting of mangrove → Improved Mangrove habitat

Converted to a results chain

Substitution of mangrove wood in construction → Reduced use of mangrove wood in construction → Reduced demand for mangrove wood → Reduced harvest of mangrove → Improved Mangrove habitat

Key

Strategy		Contributing Factor		Intermediate Result	
Conservation Target		Direct Threat		Threat Reduction Result	

Simple Example: Results Chain

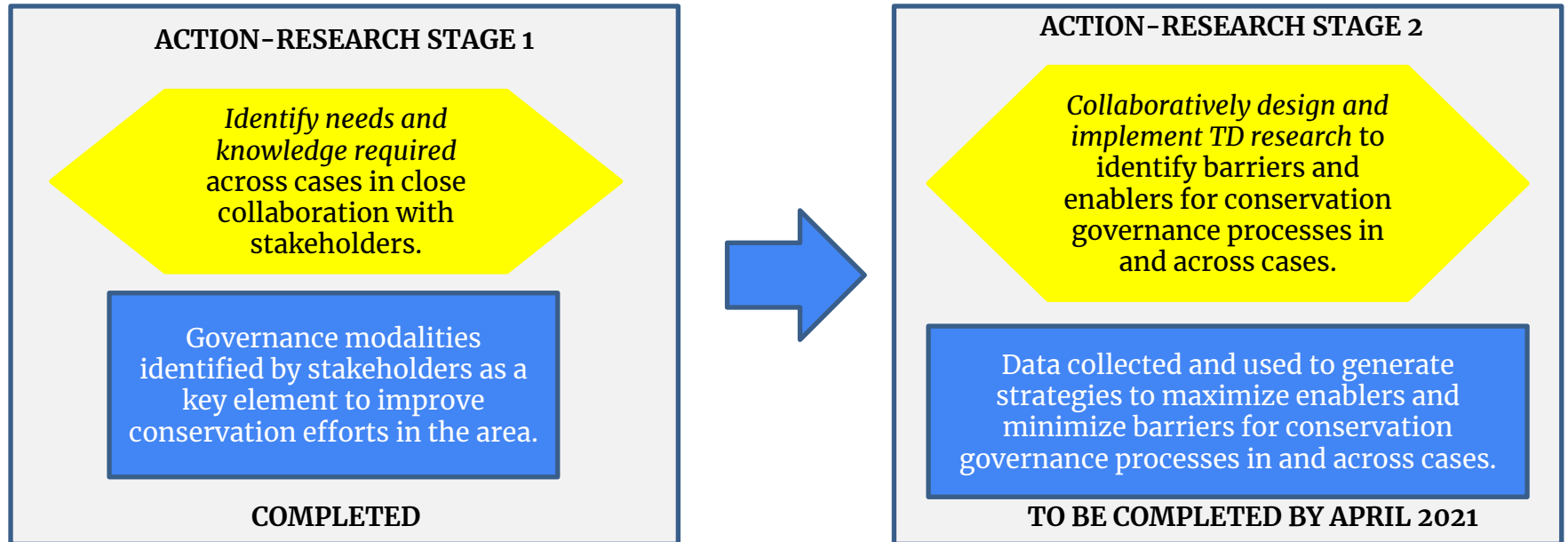| INPUTS	→	ACTIVITIES	→	OUTPUTS	→	OUTCOME	→	IMPACT

EVERYDAY EXAMPLE: I want to do something about living a **healthier life**. This is the desired **impact**. To do that, I want to reduce my weight. This is my planned **outcome**. To reduce my overall weight, I plan on eating more **vegetables** and **exercise** regularly. These are my planned **outputs**. Eating healthier requires more conscious **shopping** habits. More exercise requires me to go running or join a gym. These are some of my planned **activities**. These activities require some extra **time** and **money**. These are the **inputs**.

INPUTS	ACTIVITIES	OUTPUTS	OUTCOME	IMPACT
Time, Money, Planning	**Meal Planning & Join a Gym**	**Eat Vegetables & Exercise**	**Lose Weight**	**Live a healthier life**

Grounded Example: TD Project Results Chain

- IAI-funded Small Grants Program (SGP) project (2018-2022), "*Incorporating Local and Traditional Knowledge Systems: New Insights for Ecosystem Services and Transdisciplinary Collaborations*"

- Central research question: Which governance modalities are best suited to navigate divergent interests, incorporate local and traditional knowledge, and achieve local-scale biodiversity conservation implementation?

- 4 case study locations: Colombia, Uruguay, Chile, Canada

ACTION-RESEARCH STAGE 1

Identify needs and knowledge required across cases in close collaboration with stakeholders.

Governance modalities identified by stakeholders as a key element to improve conservation efforts in the area.

COMPLETED

ACTION-RESEARCH STAGE 2

Collaboratively design and implement TD research to identify barriers and enablers for conservation governance processes in and across cases.

Data collected and used to generate strategies to maximize enablers and minimize barriers for conservation governance processes in and across cases.

TO BE COMPLETED BY APRIL 2021