

# A Systemic Method for Assessing the Impacts of Agricultural Research for Development

Temple L., Barret D., Dabat MH., Devaux-Sparatakis A., Faure G., **Hainzelin E.**, Mathé S.,  
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**The Transformation of Research in the South: policies and outcomes**  
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IDRC | CRDI

Canada



# Introduction

Scientific research is questioned more than ever to better address the global society challenges:

- Human development under demographic pressure
- Uncertainties generated by climate change
- Dwindling of natural resources
- Socio-political tensions generated by migrations, ...

In agrifoods sector, growing controversy on techno-centered development models from the “Green Revolution”

- Need to strengthen interface R/D to consider social and environmental externalities of technological changes
- Need to renew the methods to evaluate relations between research and beneficiaries
- Need to better document and measure research impact

# Two main scientific communities and approaches

## A first community uses financial evaluation of the impacts of research, based on models involving surpluses and cost-benefit assessment

- proving research effectiveness by means of quantitative measurements evidence
- Shows generally a good return on investments in research (10-30% since the 70s)
- **dominant but controverted** (disconnection between increased investment in research and slowdown in productivity gains, linear concept of innovation).
- **not effective with a structural shortage of databases** (developing countries).

## A second community uses systemic approaches to link research activities with development and to understand the process of technological innovation

- Trying to understand the process leading to the impact and the causal mechanisms.
- Using quantitative tools to answer the questions posed by systemic approaches
- characterizing the conditions under which agricultural research improves major development indicators.

# Outline

## 1. “ImpresS” or the development of a collaborative methodological approach

- A case study approach
- Key concepts and principles
- Five-step evaluation process applied

## 2. ImpresS first results: construction of a systemic model for assessment of the contribution of research to development

- The interactions giving rise to the research outputs
- Contribution of research to the “outcomes” of the innovation process

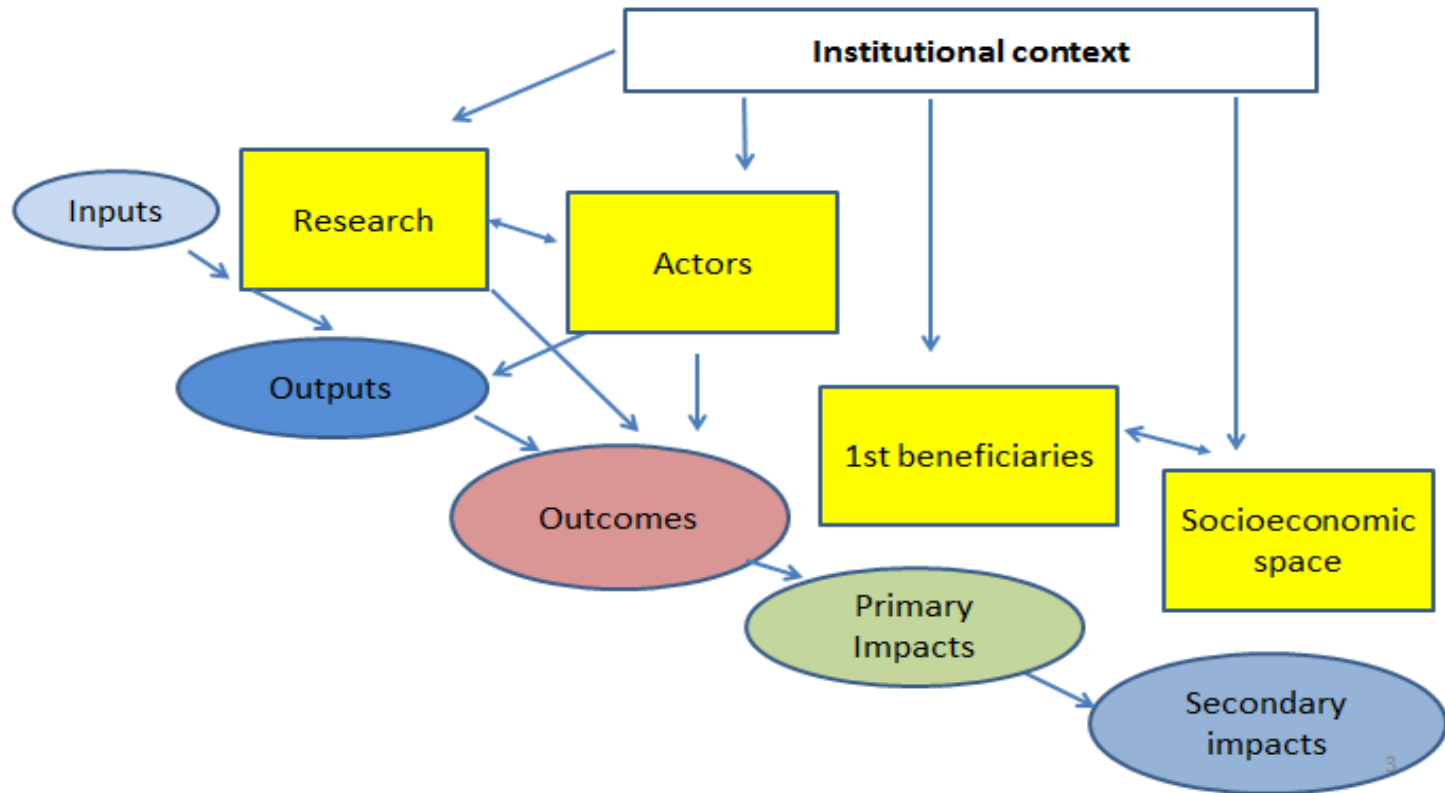


# ImpresS based on a case study approach

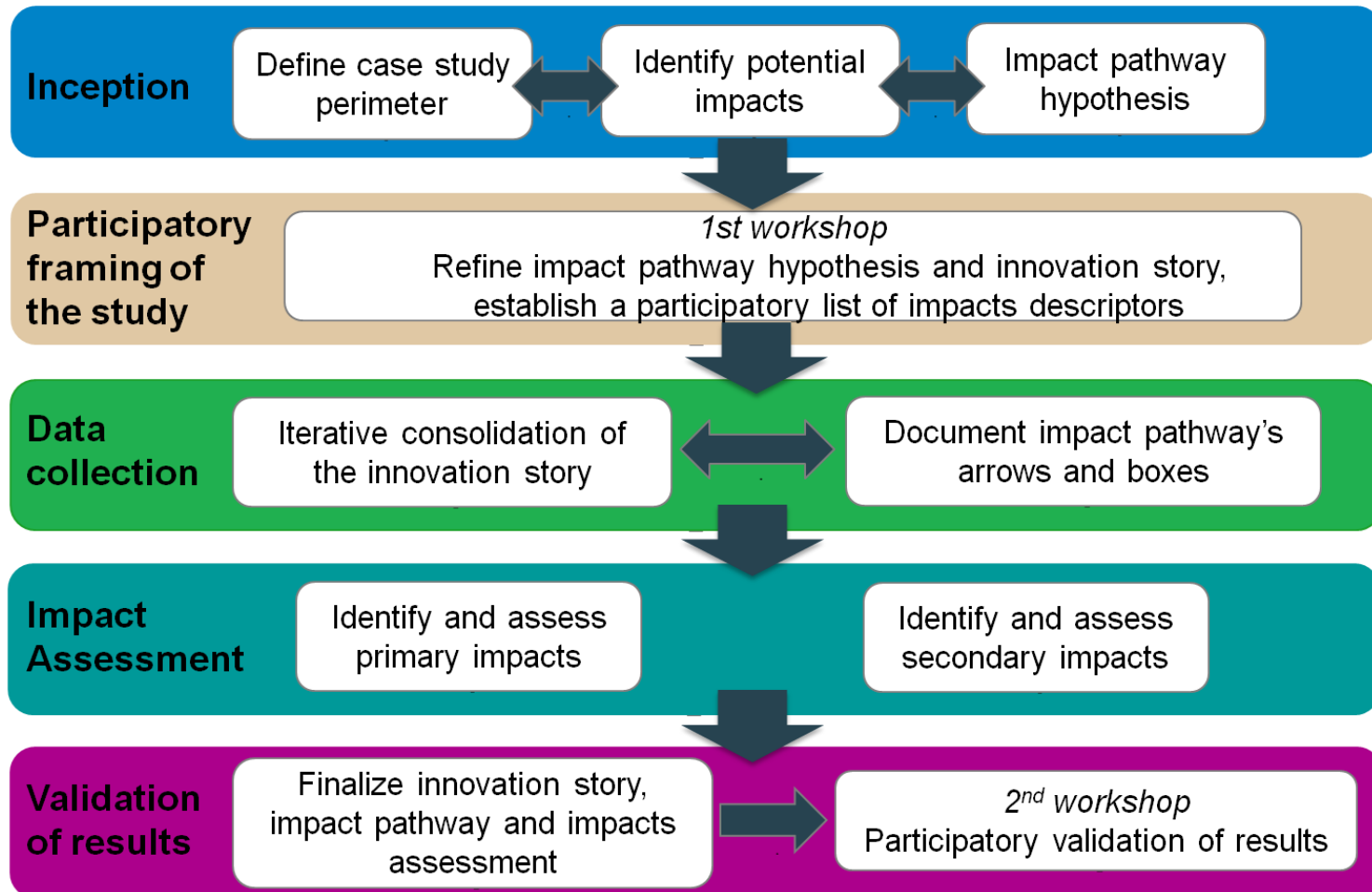


# “ImpresS” key concepts and principles

- Based on the impact pathway (Mayne 2008; Douthwaite and Gummert 2010)
- Focus on capacity building as a key factor contributing to the impact
- A participatory approach to impact evaluation
- A specific attention to public policies



# ImpresS is a five-step evaluation process



## Part 2

# **ImpresS first results: construction of a systemic model for assessment of the contribution of research to development**



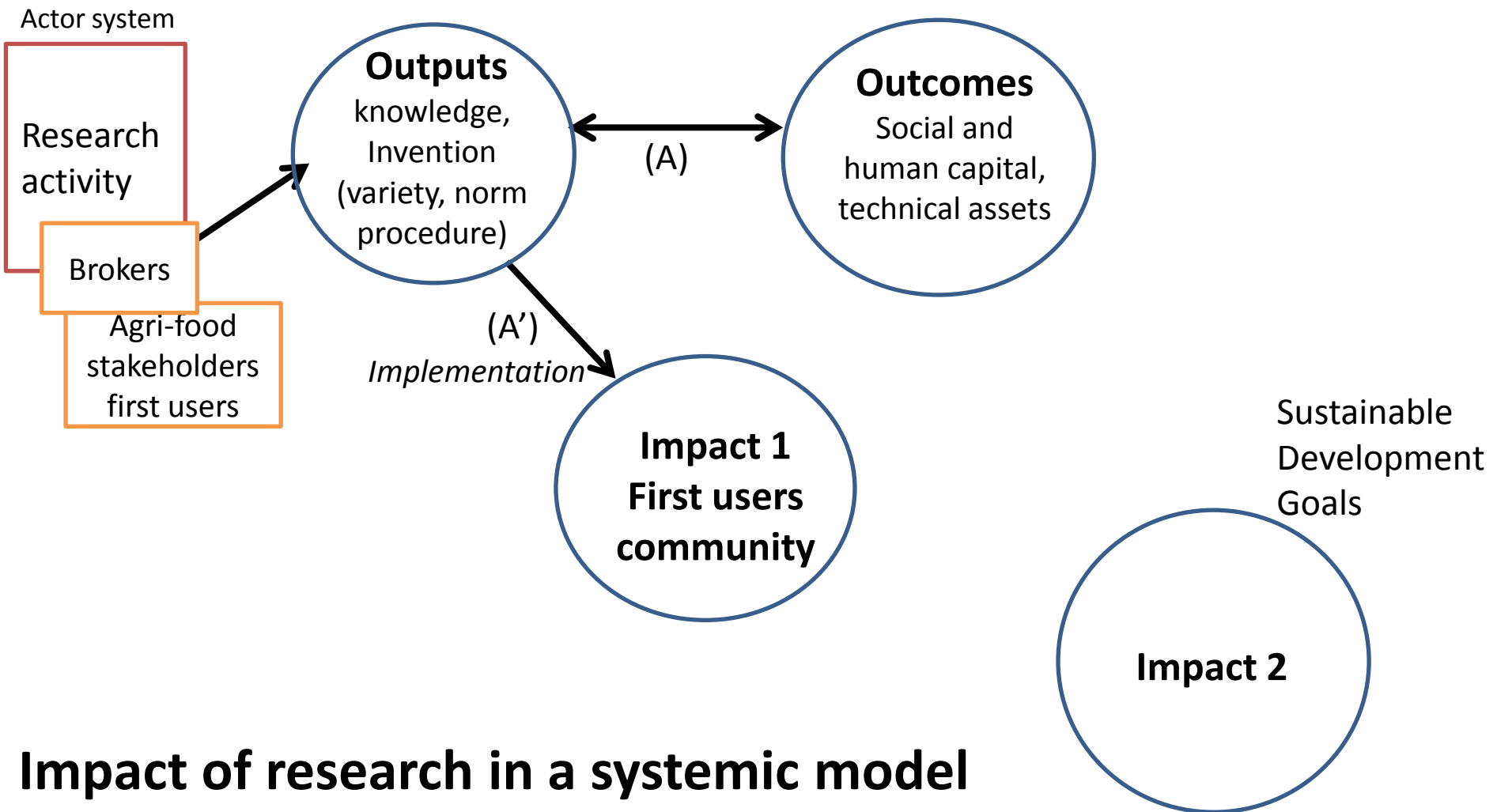
	Feedback on research and outputs (Arrow A)	Impacts 1: on the 1st users community (Arrow B)	Impacts 2: Dissemination (Arrow C)	Impacts on institutions and policies (Arrow D)
Capacity building among stakeholders	<ul style="list-style-type: none"> <li>- New research front</li> <li>- Knowledge of constraints</li> </ul>	<ul style="list-style-type: none"> <li>- <b>veterinary service empowerment</b></li> <li>- learning capacity enhancement</li> <li>- More knowledge of biodiversity</li> </ul>	<ul style="list-style-type: none"> <li>- Enhancement of learning &amp; implementation capacity</li> <li>- expertise &amp; imparting knowledge</li> </ul>	<ul style="list-style-type: none"> <li>- Regional innovation policy</li> <li>- Promoting rationality and scientific culture</li> </ul>
Creation and effectiveness of institutions	<ul style="list-style-type: none"> <li>- Sustainability of monitoring network</li> </ul>	<ul style="list-style-type: none"> <li>- Creation of networks: pest monitoring, virus incubation, testing of new varieties</li> <li>- GI creation; PO creation</li> </ul>	<ul style="list-style-type: none"> <li>- Coordination between public services: health &amp; veterinary</li> </ul>	
Fostering interactions between stakeholders	<ul style="list-style-type: none"> <li>- Prototype development</li> <li>- <b>Collaborative platform</b></li> </ul>	<ul style="list-style-type: none"> <li>- Researcher/public service interaction: ministry, territorial community (surveillance, seed, ....)</li> <li>- <b>Researcher/farmer interactions: individual, boards, OP</b></li> <li>- Intra-industry interactions (seed; Equipment manufacturer/processor</li> </ul>	<ul style="list-style-type: none"> <li>- Researcher/technician/farmer interactions</li> </ul>	<ul style="list-style-type: none"> <li>- <b>Professionalization of stakeholders' collectives (ability to work together)</b></li> <li>- New science/society relations</li> </ul>
Knowledge infrastructure	<ul style="list-style-type: none"> <li>- Virus isolation in the laboratory</li> </ul>	<ul style="list-style-type: none"> <li>- Participatory experimental arrangement</li> <li>- Seed marketing method: participatory outreach for plant identification</li> <li>- <b>Virus monitoring protocol</b></li> </ul>	<ul style="list-style-type: none"> <li>- Number of manure pits</li> <li>- <b>Mobile application: information sharing</b></li> </ul>	<ul style="list-style-type: none"> <li>- Piloting of public intervention monitoring</li> </ul>
Impacts on potentially measurable development	<ul style="list-style-type: none"> <li>- New databases</li> <li>- Decrease in cost of information to identify plants</li> </ul>	<ul style="list-style-type: none"> <li>- Decline in diseases &amp; parasitic attacks, health problems</li> <li>- Practical adaptation of agriculture: elimination of chemical treatment, organic fertilization</li> <li>- New adoptions: varieties machines, traps,</li> </ul>	<ul style="list-style-type: none"> <li>- Change of scale of impacts: (according to spillover)</li> <li>- Rehabilitation of old varieties</li> <li>- Certified seed production</li> <li>- Decrease in cost of invasive plant control</li> <li>- Increased biodiversity</li> <li>- Identify need for vaccination</li> </ul>	<ul style="list-style-type: none"> <li>- Ability to predict the future and to reduce the risks ( invasive plants, viral pandemics in animals, ...)</li> </ul>

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## **4 types of interactions structuring the impact pathway**

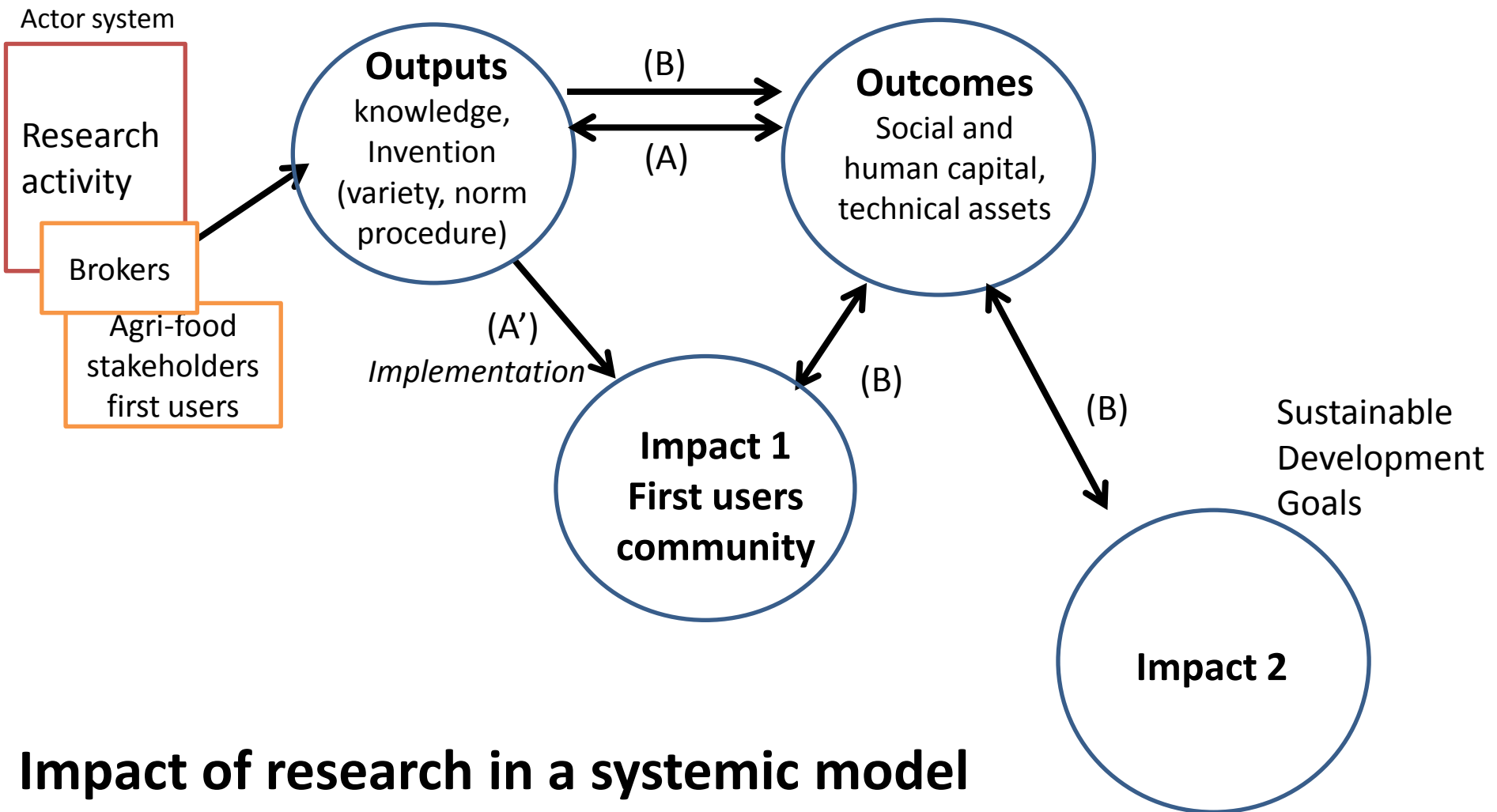
- A. interactions giving rise to the research outputs.
- B. Interactions with the 1<sup>st</sup> users community either leading to outcomes, defined as cross-cutting resources that may come into play at different stages of the process or causing impacts limited area
- C. Dissemination and diffusion from impact 1 at a larger level (industries and territories)
- D. Interactions that produce effects on institutions and public policies

Institutional environment and public policies



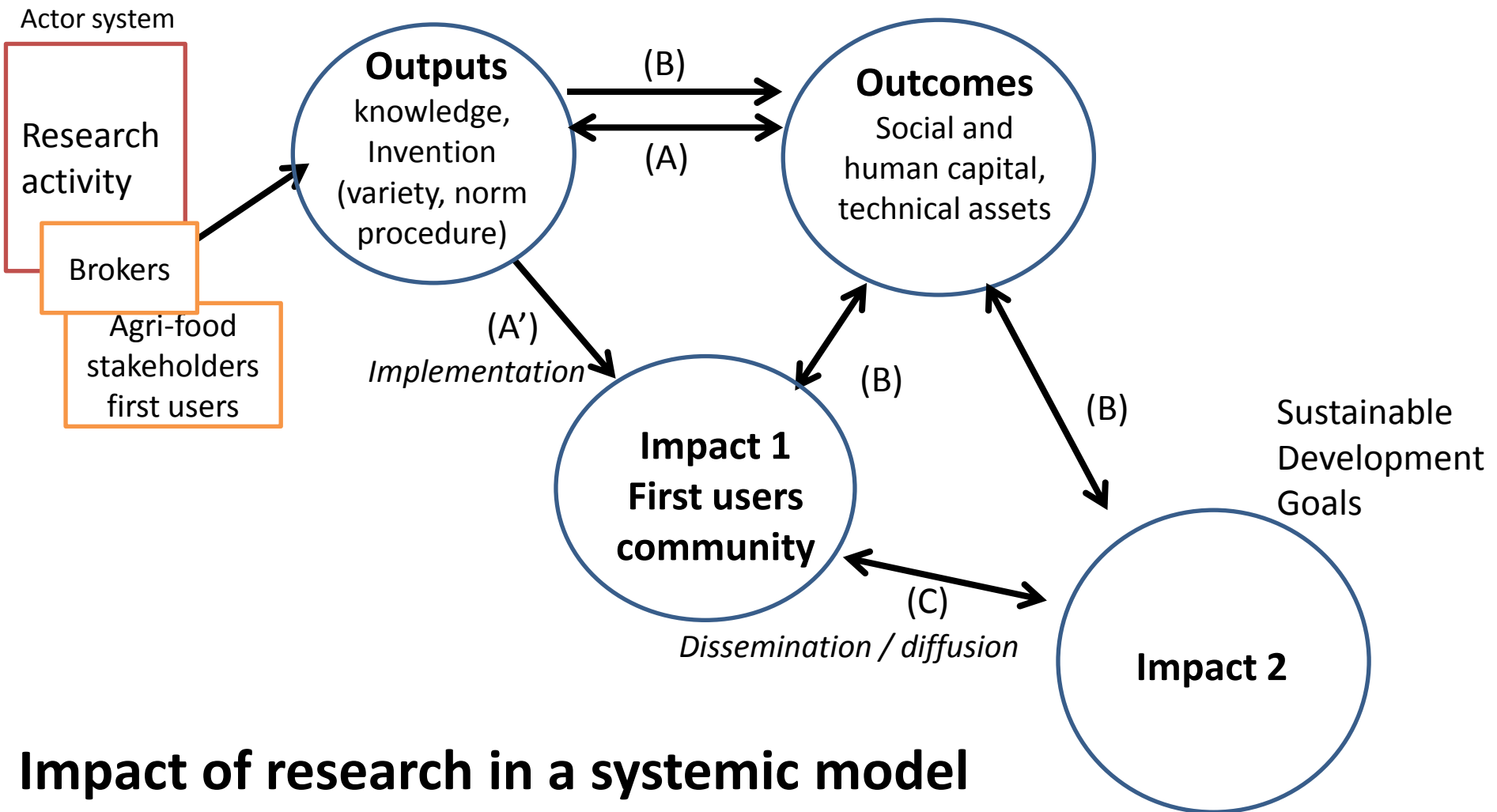
**Impact of research in a systemic model**

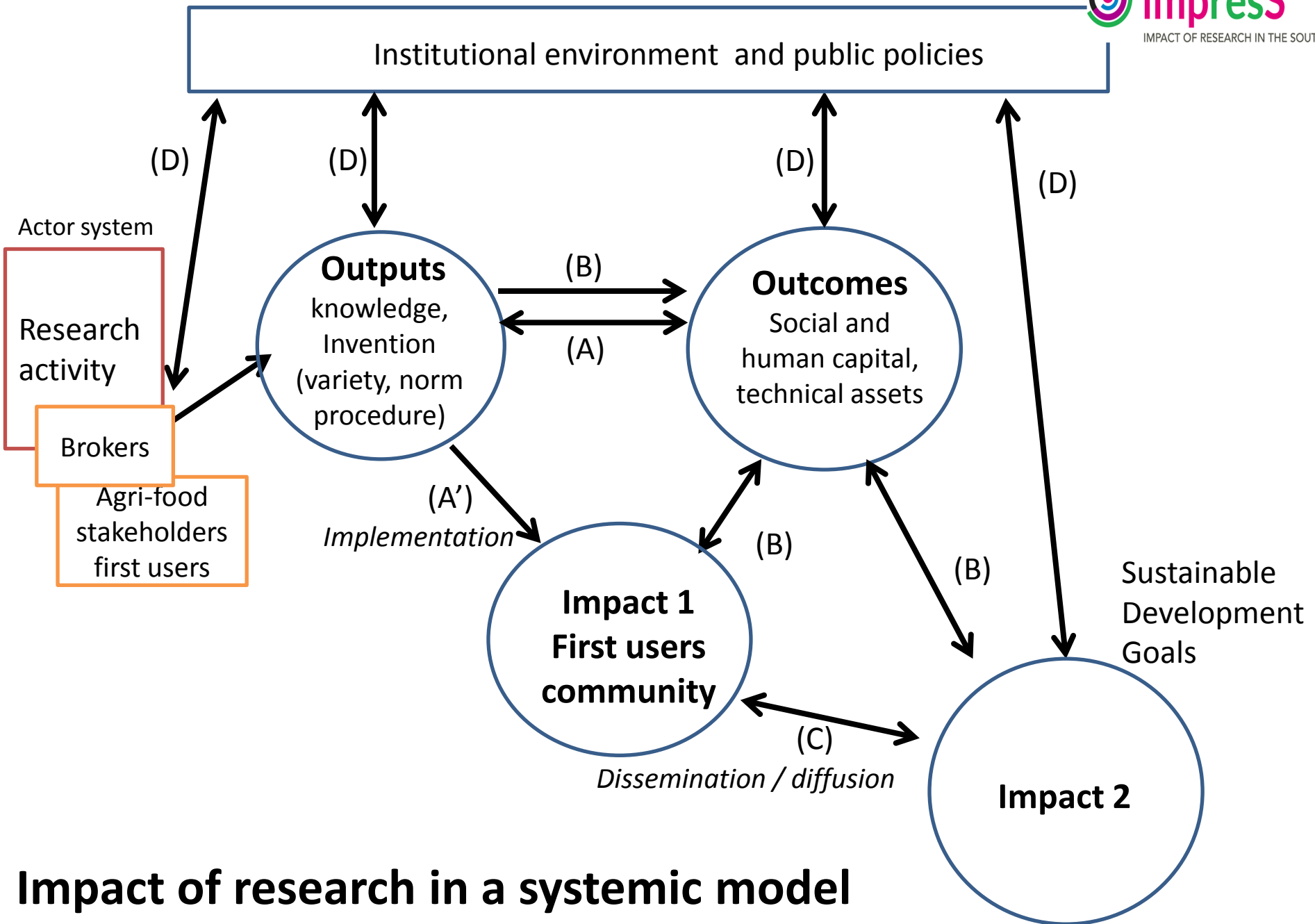
Institutional environment and public policies



**Impact of research in a systemic model**

Institutional environment and public policies





## Impact of research in a systemic model

# Conclusion

- Importance of interactions between researchers and other actors throughout the innovation process.
- These interactions are a major incentive to use participatory methods like ImpresS to analyze and document research impacts.
- Our collection of cases studies shows the essential role of research to generate outcomes through different types of interactions, in particular learning situations. These outcomes become key resources to enable outputs use and generate different impact pathways.
- The proposed systemic methodological framework can help to renew impact assessment of research, especially in developing countries context.
- For an institution like Cirad, the ultimate objective is to reinforce the culture of impact amongst its scientists and research teams, so they can better structure their interactions with the other actors in innovation process for development.



More information on the case studies:

<http://impress-impact-recherche.cirad.fr/>

Thanks to CIRAD's case owners, the co-owners in the South and the interns associated with the case teams within the **ImpresS** project, thanks to whom the impact pathway of each of the 13 cases was determined, and particularly to those among them who took part in the outcome identification

An aerial photograph of a mountainous landscape featuring terraced rice fields. The fields are arranged in a complex, winding pattern across the slopes, showing varying shades of yellow and green, indicating different stages of rice growth. In the foreground, out of focus, are purple flowering branches, likely from a plant like Amaranthus. In the background, a small cluster of buildings with blue roofs is visible among trees on a hillside.

Thank you very much !

<http://impress-impact-recherche.cirad.fr/>