

# Capacity to innovate from a system CGIAR research program perspective



RESEARCH  
PROGRAM ON  
Dryland Systems



RESEARCH  
PROGRAM ON  
Integrated Systems  
for the Humid  
Tropics



RESEARCH  
PROGRAM ON  
Aquatic  
Agricultural  
Systems

# CAPACITY TO INNOVATE FROM A SYSTEM CGIAR RESEARCH PROGRAM PERSPECTIVE

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# INTRODUCTION

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The three system CGIAR research programs on Integrated Systems for the Humid Tropics, Dryland Systems and Aquatic Agricultural Systems have included “capacity to innovate” as an intermediate development outcome in their respective theories of change. The wording of the intermediate development outcome is “increased systems capacity to innovate and contribute to improved livelihoods of low-income agricultural communities.” This note captures our collective thinking about this intermediate development outcome from a systems perspective to clarify it and inspire other programs.

## WHAT IS A SYSTEM'S CAPACITY TO INNOVATE?

Integrated systems are complex wholes in which a range of social and biophysical processes interact across various levels and scales. Reorienting the dynamics of systems in favor of realizing desirable outcomes—for example, intermediate development outcomes—is essentially about changing the way people interact with each other and respond to their changing environment. This requires capabilities at the level of individuals, communities, organizations and networks, and those that have a mandate to catalyze and support innovation processes in society; e.g. international nongovernmental organizations, CGIAR and funding agencies.

Core capacities that are needed at the level of interdependent societal stakeholders:

- the capacity to continuously identify and prioritize problems and opportunities in a dynamic systems environment.
  - the capacity to take risks, experiment with social and technical options, and assess the trade-offs that arise from these.
  - the capacity to mobilize resources and form effective support coalitions around promising options and visions for the future.
- the capacity to link with others in order to access, share and process relevant information and knowledge in support of the above.
  - the capacity to collaborate and coordinate with others during the above, and achieve effective concerted action.

In supporting the above, those with a mandate or willingness to catalyze system innovation processes will need to develop the following:

- a conceptual understanding of how change comes about in complex systems and how to intervene effectively.
- the ability to orchestrate and facilitate interaction in support of the above.
- the ability to inform societal agents and embed research activity in ongoing processes of change.

Together, these capacities form a system's capacity to innovate.



Participants map out their vision of success at the AAS Barotse Hub Roll out Workshop, Zambia.

## WHY IS CAPACITY TO INNOVATE IMPORTANT?

The essence of sustainability and resilience lies in the capacity of system actors to innovate and adapt. Communities whose livelihoods come at least partly from agriculture and natural resource management are in the midst of a rapidly changing world. This context requires continuous adaptation of technology, as well as of social and institutional arrangements, such as values, incentive systems, formal and informal rules, market organization, land-tenure systems, and policies. When actors at different levels in agricultural research and development—ranging from resource-poor women farmers to international agricultural research and development policymakers—can better interact, they can bring their different perspectives and insights into the process of understanding the dynamics of the system and exploring how to deal with them. **This makes them better able to react quickly, flexibly and creatively to shocks, challenges and opportunities. Thus, the capacity to innovate is key for resilience—that is, for the survival and well-being of society.**

As indicated earlier, people and their actions and interactions play an important role in building and changing the coherence of a system. Focusing on increasing resource-poor and vulnerable people's capacity to innovate—that is, focusing on inclusive innovation—can change the power balance, so that these people can recognize more possibilities, unfold their innate creativity, and more confidently tackle newly emerging problems and opportunities in a more equitable world. Supporting such dynamics requires new capacities among a broader set of actors, including the CGIAR system.



A typical integrated system in the humid tropics: the rolling, cultivated hillsides of southwestern Uganda

Research can play various roles in enhancing capacity to innovate. Besides playing more conventional roles, such as that of an outside informant or advisor, researchers may be invited to conduct collaborative research in already-existing spaces of interaction. When such spaces are lacking, or if they are restricted to specific issues, scales or levels, research organizations can themselves create spaces by initiating and facilitating multistakeholder mechanisms such as innovation platforms. These bring relevant actors together to identify, analyze and address opportunities and constraints in a subsector or related to a specific theme. Research and inquiry in such platforms can inspire and provide eye-openers. When done in a collaborative mode, they can help reduce critical uncertainties, result in common understandings of and more agreement about problems and solutions, and structurally improve relationships among interdependent stakeholders. All this is highly relevant to fostering meaningful change, development and innovation.

Tasks that researchers can perform in such settings include the following:

- help people visualize their networks and how they might connect to others and other initiatives across interdependent levels; for example, using social network analysis.
- provide relevant knowledge and information.
- help people reflect on and analyze their situation, problems and opportunities.
- elicit critical uncertainties and translate these into research questions for different disciplines.
- help people experiment with a variety of options and analyze trade-offs.
- document and reflect on the process as part of monitoring and evaluation efforts.



Another strategy is to employ participatory methodologies for more generic reflection on the functioning of innovation support systems and interaction patterns with relevant stakeholders, such as the Rapid Appraisal of Agricultural Knowledge Systems, or RAAKS, methodology. Such approaches provide a model of learning and inquiry that specifically aims at diagnosing crosscutting problems in specific subsectors or realms of innovation. Finally, research may study the contribution of different mechanisms, including innovation platforms, to building a system's capacity to innovate, and feed findings back into policy and practice.

## HOW DOES A SYSTEM'S CAPACITY TO INNOVATE FIT IN OUR THEORY OF CHANGE?

The overall role of a system's capacity to innovate in the theory of change of the CGIAR Integrated Systems for the Humid Tropics, Dryland Systems and Aquatic Agricultural Systems programs is shown in Figure 1. The relation with other intermediate development outcomes will be situation and program specific, hence not specified here in detail.

Reasoning from bottom to top, we see research as a process-oriented intervention aimed at contributing to system change. Research interventions can take various forms and are likely to include orchestration of interaction, exploration, learning and experimentation at various interconnected levels. Interventions address social and institutional issues and questions, as well as biophysical and technical issues and questions, related to the functioning of value chains, the use of natural resources and associated livelihood patterns. This is an iterative process that goes along with the gradual building of capacity to innovate, which in turn enhances the process in a self-reinforcing manner.

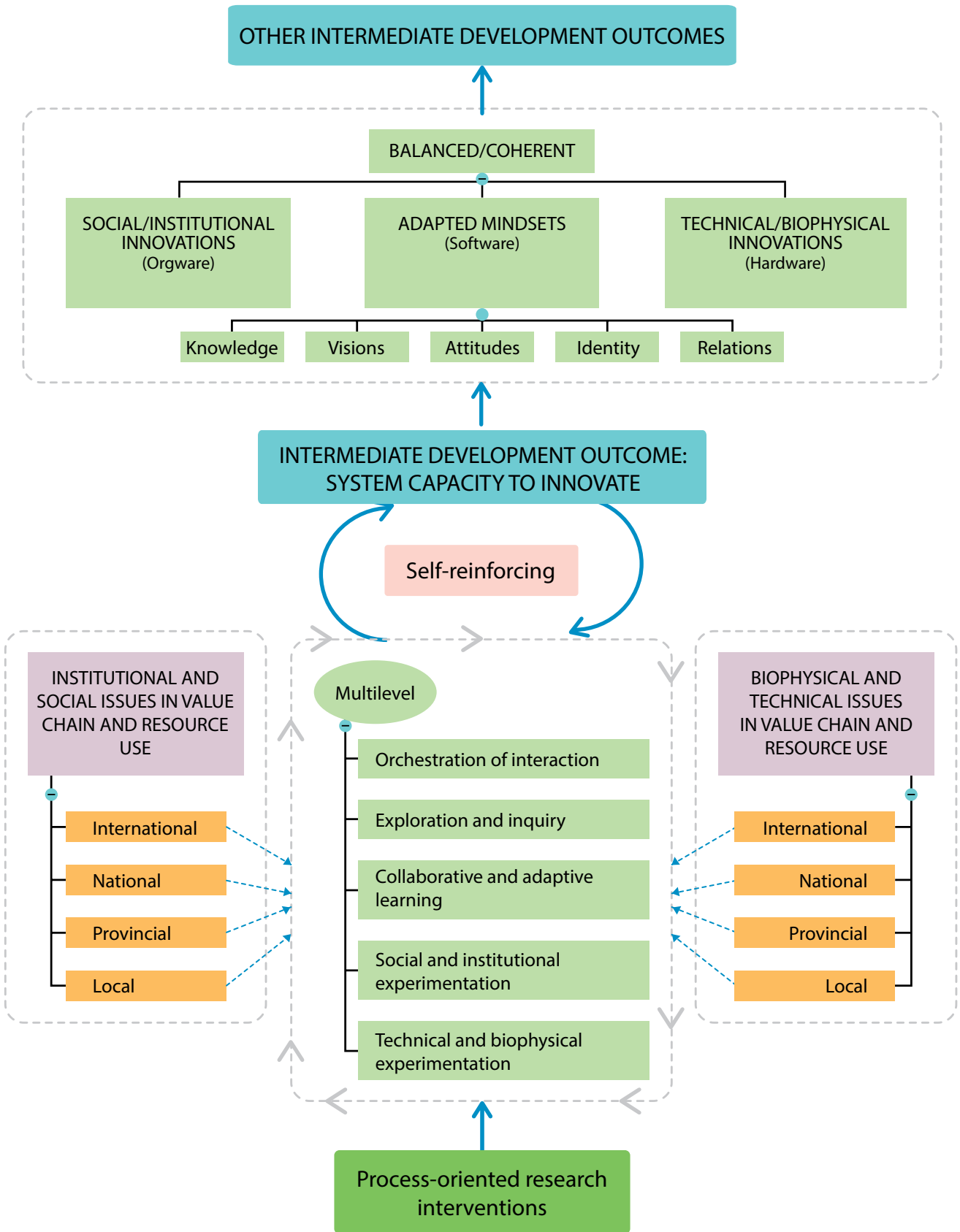
In an ever-changing and uncertain environment, it is important to experiment with a range of options, both in the realm of technology and management practices

and in the realm of social organization and interaction. Through improved capacity to innovate, stakeholders can select, combine and strengthen specific options, which eventually results in coherent combinations of "hardware" or technical innovations, "orgware" or social innovations, and "software" or adapted mindsets. New orgware may include changes in policy, market organization, legal frameworks, service provision and incentive systems that are necessary to enable people to make use of new ideas and technical opportunities. From a systems perspective, creating these enabling conditions for technology to work needs to be seen as part and parcel of the innovation challenge. Developing successful combinations in one site makes it easier to scale the technology to another. These new combinations will in time result in the realization of other intermediate development outcomes and eventually system-level outcomes. Given the many constraints affecting the countries in which we work, and the fact that system innovations have a time horizon of at least 10 years even under favorable conditions, we are talking about a long-term process.



Climbing bean trials in Nyagatare, in Rwanda's Eastern Province





**Figure 1.** Graphic representation of the role of a system’s capacity to innovate in the theory of change.

## HOW DO WE MEASURE A SYSTEM'S CAPACITY TO INNOVATE?

When measuring the capacity of the system to innovate, we need to find a balance between **indicators of the capacity itself** and the manifestations and consequences realized through this capacity. This is actually much the same as in research on soil fertility, for example: When we add fertilizer to the soil in order to enhance soil fertility, the indicators we use to assess whether soil fertility has effectively increased often relate as much to the response of plants—plant growth, yields, etc.—as to the nutrient status of the soil.

We will use indicators that are directly linked to the capacity itself, such as:

- **number of networks and initiatives involved in exploration, inquiry, technical and social experimentation, adaptive learning, etc.**
- number of technical and social experiments that are ongoing or have been carried out, and additional attributes, such as type and number of participants involved and represented, inclusiveness, appreciation of experimentation, level of complexity and ambition, scale and level of operation, etc.
- **existence and use of linkages in order to access knowledge and information.**
- **extent of coalition formation around promising initiatives and options.**
- conducive modes of thinking and acting in innovation support environments.

In addition, we will use indicators that are linked to the outcomes generated through the system's capacity to innovate. Such indicators include the following:

- upscaling and outscaling of interlinked technical innovations and social-institutional innovations, such as enabling changes in incentive systems, markets, legal rules, policies, collective action, relations, etc.
- **changes in mindset among interdependent actors** in terms of their knowledge, understanding, discourse, vision, attitudes, etc.

Both quantitative and qualitative strategies for data collection and analysis will be used in measuring progress against these indicators, and where appropriate, participatory monitoring and evaluation approaches will be used. In order to evaluate whether or not research interventions have contributed to emerging changes, we will make use of “monitoring and evaluation for learning” approaches that allow us to prospect for emerging change and retrospectively identify theories of change—that is, causal pathways—and then evaluate CGIAR research program contribution. This can be done through “rapid cycle” approaches **such as most significant change and outcome harvesting**, as well as longer-duration methods **such as documentation of innovation histories**. Building, testing and further improving theories of change based on what we learn in this way will build understanding of how change comes about in complex systems and how to intervene effectively. In other words, monitoring and evaluation for learning can build capacity to innovate.

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