

Strengthening capacities for research in development in aquatic agricultural systems



STRENGTHENING CAPACITIES FOR RESEARCH IN DEVELOPMENT IN AQUATIC AGRICULTURAL SYSTEMS

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LIST OF ACRONYMS AND ABBREVIATIONS

AAS	CGIAR Research Program on Aquatic Agricultural Systems
Bioversity	Bioversity International
Caritas	Caritas Internationalis
ECDPM	European Centre for Development Policy Management
ICRA	International Center for development oriented Research in Agriculture
NGO	nongovernmental organization
OECD	Organisation for Economic Co-operation and Development
Promundo	Instituto Promundo
RinD	research in development
UN	United Nations

ABSTRACT

The research-in-development (RinD) approach to agricultural research focuses on working closely with communities through multistakeholder engagement to strengthen capacities to design, plan, implement and adapt research in order to improve the lives and livelihoods of the resource-poor living in complex social-ecological systems. The approach requires researchers and implementing partners to learn new skills and build new capacities as they work in multistakeholder teams. Capacity development is central to programs utilizing RinD, both to ensure quality engagement with stakeholders and to enable capacity to innovate as an outcome. In this working paper, we share learning from the implementation of a systems approach to capacity development in the CGIAR Research Program on Aquatic Agricultural Systems (AAS) over 3 years in five geographies. We discuss both the conceptual and the practical implications of moving beyond a linear view of building capacity (focused mainly on training) and share how we have defined core competencies, have facilitated self-assessments of diverse teams in context, and are designing interventions to respond through a blended learning methodology. Through the process, we have learned that RinD implementation teams must embrace ambiguity as an intrinsic element of the approach. This requires ongoing dialogue across teams, organizations and institutions that view performance through multiple lenses. Further, we have learned that, while on-the-job learning is central for developing RinD competencies, there is also a need to be explicit about capacity development to further catalyze the process. A conceptual framework is provided that illustrates the link between capacity development and improved implementation, as well as how improved implementation enables system capacity to innovate.

INTRODUCTION

The CGIAR Research Program on Aquatic Agricultural Systems (AAS) seeks to use agricultural research to improve the lives and livelihoods of the resource-poor in aquatic agricultural systems. In some locations, it uses a participatory engagement approach to working in complex social-ecological systems; this is called research in development (RinD).¹ RinD aims to support innovation, learning and impact within geographically defined systems or hubs² by embedding research within development activities. At the same time, AAS seeks to stimulate a paradigm shift in agricultural research within CGIAR and beyond. Commitment to capacity development is central to the RinD approach of the program, and the capacity to innovate³ has been identified as an intermediate development outcome.

The AAS approach to RinD focuses on multistakeholder engagement across scales as a vehicle to strengthen capacities to design, plan, implement and adapt agricultural research. Capacity development in this context moves beyond a view of knowledge transfer as a linear process that happens through formal training to be understood as a multidimensional and multi-actor process (Pearson 2011). We define capacity development as “the process whereby people, organizations and society as a whole unleash, strengthen, create, adapt and maintain capacity over time” (OECD 2008, 244). We understand capacity as the ability of individuals, organizations or society as a whole to set and implement development objectives, as well as to identify and meet development challenges in a sustainable manner. (See Land 2000.)

Within AAS, capacity development is important in two ways. First, as an element of the RinD approach, it builds the quality of program implementation, engagement, analysis and learning processes that are the foundation of multistakeholder engagement. Second, it enables “individuals, organizations and systems to adapt to new and constantly changing environments, to learn and analyze internal and external context and relate and build partnerships” (Ortiz and Taylor 2008, 14). Understood in this way, the capacity that is developed through engagement with stakeholders and partners in context over time becomes an enabling outcome that contributes to poverty reduction.⁴

In this working paper, we share progress made on capacity development as part of RinD in five AAS hubs over the first 3 years of implementation. We draw upon learning from the implementation of a strategic program initiative aimed at ensuring quality of implementation, which relies in part on building teams with the relevant skills, knowledge and attitudes. To situate our learning, we first provide a brief overview of the AAS systems approach to RinD. We then describe the capacity development processes implemented and share our learning from each. Finally, we provide reflections and implications on how agricultural research programs that aim to build capacity to innovate in complex systems can plan and implement capacity development.

The RinD approach

The RinD approach is continually evolving through program implementation. It builds on previous CGIAR and other agricultural research programs that are concerned with using research to achieve development outcomes and impact (Hawkins et al. 2009; Hall et al. 2014). Holistic and outcome-oriented approaches to agricultural research view agricultural innovation as emerging from the complex and dynamic interaction among multiple actors involved in growing, processing, packaging, distributing, and consuming or otherwise using agricultural products together with the various actors, such as researchers and extension and business service providers, who in one way or another support these activities (Klerkx et al. 2012). This interaction requires actors to simultaneously deal with many complementary activities well beyond the traditional domain of research and development or extension services (World Bank 2012).

The overall theory of change underpinning the RinD approach is that agricultural research will act as a trigger to unleash the system's potential for change and innovation. This occurs through facilitating the interaction of multiple actors within complex aquatic agricultural systems as part of the research process. Facilitation is not normally understood as part of formal research that tends to be focused on developing and delivering technologies.⁵ Thus, RinD calls for a paradigm shift in the way agricultural research engages with and contributes to development outcomes, being more explicit about connecting multiple actors across scales in the agri-food system and enabling collective action among them. Participatory action research provides this theoretical and practical orientation to research (Apgar and Douthwaite 2013). It promotes collective identification of actions to address development challenges at both community and the wider system's level through joint inquiry. Joint inquiry is implemented through partnerships that foster stronger connections between actors as development challenges are addressed.

Approximately 450 million people in Africa, Asia and the Pacific depend on aquatic agricultural systems for their livelihoods; 137 million of

these people live in poverty (Béné and Teoh 2014). Working in these diverse and complex systems, AAS implements agricultural research through RinD to reduce poverty and improve the lives and livelihoods of a diverse set of actors. Consequently, agricultural research must engage with the social differentiation that influences—and at times defines—poverty in these systems. This requires understanding the power dynamics involved in the relationships, networks and opportunities that support or inhibit innovation in the interest of all actors. Underpinning the RinD implementation strategy, therefore, is a belief that achieving change where poverty is entrenched requires direct engagement with the resource-poor and marginalized to build capacity, facilitate their empowerment, and change the underlying social and gender norms that hold them back.

RinD seeks transformative change through understanding hidden causes of poverty and inequality. As well as direct engagement with stakeholders through RinD, associated changes in the institutional and policy setting to overcome barriers faced by the resource-poor are vital if agricultural innovation is to contribute to poverty reduction, economic growth and sustainable natural resource management. Capacity development at institutional, organizational and individual levels is therefore an essential component of RinD, underpinning the need for systems, organizations and individuals to be able to engage in joint inquiry, look beneath the surface to understand underlying power dynamics, and learn to adapt to complex situations and constantly changing environments.

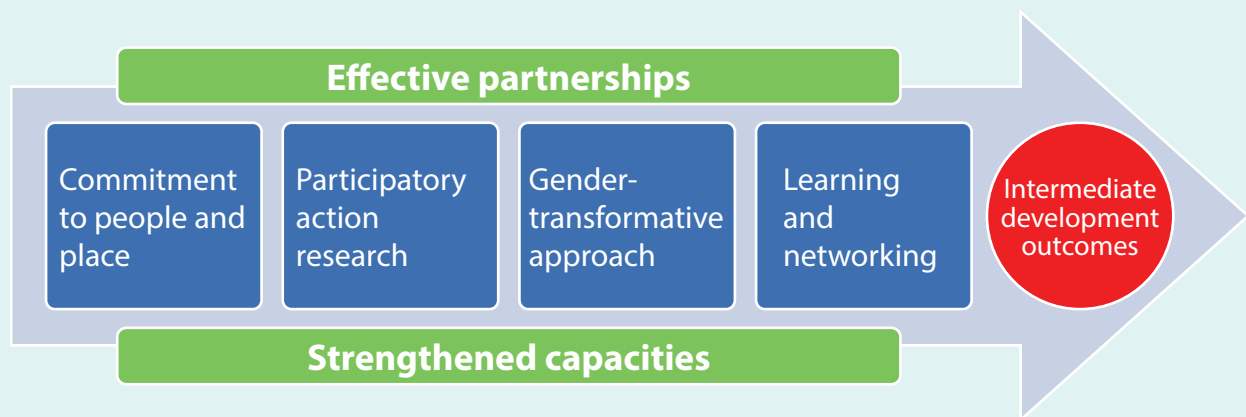
RinD is not a rigid framework but instead evolves through ongoing learning from contextualized practice in the hubs. There is no blueprint for working in complex environments that can be replicated in all settings. Rather, the approach should be guided through a set of principles that underscore the integration of various perspectives, analysis, learning and action. (See Hawkins et al. 2009, for example.) As guiding principles for systematic implementation across hubs, AAS uses four core elements and two enabling elements distilled

from learning through the first years, shown in Box 1 (from Dugan et al. 2013).

The paradigm shift in agricultural research that RinD calls for involves the following:

- a shift from seeing knowledge generation as the final objective to seeing it as a means to achieve change; from research to innovation; from a focus on technology to a focus on people;
- a shift from a mainly reductionist understanding of the parts to a systemic understanding of the relationships between the parts;
- a shift from seeing participation as a matter of consulting beneficiaries to one of facilitating engagement for interactive learning between stakeholders, resulting in joint analysis, critical reflection, planning and collective action;

Box 1. The AAS approach to RinD



Four central elements discern the way the program implements agricultural research:

- **Commitment to people and place.** Through working in hubs and engaging with communities and system stakeholders, the program defines development challenges and supports long-term engagement to address them.
- **Participatory action research.** Multistakeholder networks formed around common concerns in communities and at system level become co-researchers in processes that aim to address jointly identified challenges through the facilitation of cycles of action and critical reflection.
- **Gender-transformative approach.** Through critical reflection processes, the program identifies and overcomes social constraints and inequality that limit the opportunities and participation of resource-poor women and marginalized groups in the research and development processes. This is complemented by targeted interventions to transform and unleash the potential of individuals and groups and engage with institutional change processes.
- **Learning and networking.** Participatory development of theories of change, as well as revisiting them through the participatory action research processes, learning and purposeful network weaving supports scaling of the approach and brings about mindset shifts.

The implementation of these four elements are complemented by two enabling elements:

- **Building effective partnerships.** A multitude of actors engaged in research and development at multiple scales—local, national, regional and global—build on each other's strengths and create synergies.
- **Strengthening capacities.** Technical, analytical, organizational and institutional capacities are strengthened in order to achieve attitude and mindset shifts and work in new ways within complex agricultural innovation systems.

- a shift from working individually to working with others, in ever-changing ad hoc teams and partnerships;
- a shift from teaching to learning; from being taught to learning how to learn; from individual learning to social and transformative learning;
- a shift in the culture of research and development organizations from an exclusive focus on individual merit and competition to one that also favors collaboration and teamwork within and between organizations.

Capacity to innovate as an RinD outcome

AAS seeks to achieve impact through multiple pathways. As is explained in Douthwaite et al. (2013), three scaling pathways have been defined for the program: (i) scaling out and up of research output (knowledge, methods and technology) within the hubs; (ii) supporting transformative change in the innovation system; and (iii) using key research outputs and learning to influence the way that national and regional partners, as well as the wider development community, invest in agricultural research and development. The second pathway embodies the paradigm shift that the RinD approach calls for. It focuses on pursuing

research in ways that establish an enabling environment to foster innovation by farming and natural resource-dependent people in AAS hubs. The focus is not on producing research outputs to achieve change, but on building capacity of the system to innovate through strengthening participatory and reflective learning processes through the research process (see Box 2 for definition).

Developing capacity to innovate in systems can potentially enhance economic opportunities, foster adaptive capacity and strengthen resilience, allowing the resource-poor and marginalized to become more integrated into the innovation system and better able to adapt to pressures and respond to opportunity. Given the focus of RinD on the resource-poor and marginalized, there is also the need to ensure that a critical lens is built into the capacity to innovate as it is developed. Supporting transformation in the system requires getting beneath the surface to change the regressive individual and institutional attitudes, norms and practices that are barriers to all participating in and benefiting from the innovation processes. This RinD scaling pathway, therefore, makes explicit how working through the RinD approach may develop capacity as an outcome that in turn can lead to wider and more equitable impacts.

Box 2. Defining capacity to innovate

A system's capacity to innovate requires that stakeholders and organizations acquire and can effectively manage certain core capabilities to

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

Source: Leeuwis et al. (2014).

Systems approach to capacity development for RinD

Within the broader paradigm shift for agricultural research that RinD calls for is a shift in the way capacity development is conceptualized and, as a consequence, how it is implemented. Conventionally, capacity has been seen mainly as a hierarchy composed of various levels—individual, organizational, inter-organizational or system—without any clear interconnections between the levels. As a result, capacity development has often been seen as the process of improving the ability of agricultural research organizations to perform their assigned tasks in an effective, efficient and sustainable manner. In the more recent wave of system-oriented agricultural research, capacity development is no longer merely for improved delivery of research and technology, but is a *process* of unleashing the potential of individuals, organizations and systems.

Ortiz and Taylor (2008) argue that individuals, organizations and systems need capacity well above that which they use on specific projects each day in order to adapt to new and constantly changing environments, to learn and analyze internal and external context, and to relate and build partnerships. This is particularly true in an RinD setting. If organizations (or institutions) are only prepared for limited results and immediate program needs, then they are not preparing systemically. Developing the capacity of a system with its actors, incentives, norms, processes, etc., they argue, is paramount if sustainable results are to be achieved. Agricultural research embedded in a wider system of innovation needs therefore to focus not just on the competencies and capabilities needed to achieve technical results, but also on what it takes to build more effective and dynamic relationships among multiple actors and to “facilitate resourcefulness” and the ability to continuously learn and adapt to changing environments (Ministry of Foreign Affairs of the Netherlands 2011).



Women's workshop teaching nursery techniques in Western Province, Solomon Islands.



Participatory approach in Hetalbunia village, Khulna.

Keijzer et al. (2011) distinguish between competencies, capabilities and capacity at individual, organizational and system levels, respectively, following the original distinction made by Morgan (2006). Competencies refer to the “energies, skills and abilities of individuals.” Capability refers to the “collective ability of a group or a system to do something either inside or outside the system. The collective skills involved may be technical, logistical, managerial or generative (i.e. the ability to earn legitimacy, to adapt, to create meaning, etc.)” Capacity refers to the “overall ability of an organization or system to create value for others,” whereby the system must balance and integrate the many capabilities it has developed (Keijzer et al. 2011, 14–15). Capacity is therefore understood as a multifaceted phenomenon based on different competencies or capabilities that combine and interact to shape the overall capacity of any system.

From a systems perspective, developing capacity to implement RinD requires an interplay between individual, team and organizational levels. Those responsible

for implementation of RinD need to have a conceptual understanding of how change comes about in complex systems and how to intervene effectively. They must be able to facilitate the interaction of various actors and embed research activities in ongoing change processes. This relationship is, however, in no way linear. Changes in a system’s capacity affects organizational capabilities, which in turn affect individual competencies. In other words, the three levels cannot be addressed in isolation, but are interdependent. All levels are influenced by developments internal and external to the system that call for adaptation and responsiveness from individuals, organizations and institutions.⁶

AAS is currently working in five country hubs in key aquatic agricultural systems—the Barotse floodplain in Zambia; the Southwest Polder Zone of Bangladesh (also known as the Khulna hub); Malaita and Western provinces in Solomon Islands; Tonle Sap in Cambodia; and the Visayas-Mindanao area in the Philippines. Each of these hubs was set up and planned through a similar process and each has evolved organically over time. The hubs demonstrate diversity and uniqueness driven by the context, the challenges faced by stakeholders within them and the composition of implementation teams. Across the diversity of contexts, AAS identified a need to focus resources and time on ensuring capacities to implement RinD, as the shifts required are not just in building skills to engage across the system and build capacity, but also in mindsets. This reality resulted in a strategic program area of work on RinD capacity development that was implemented across hubs in 2014 with support from a program partner, the International Center for development oriented Research in Agriculture (ICRA). In this section, we describe the process and the findings that emerged, as well as how capacity development interventions are designed to respond to emerging needs.

Identifying RinD capacities across scales

Building on the experience of other agricultural research-for-development programs and the program definition of RinD, the starting point for the capacity development process in hubs was to identify competencies, capabilities and capacities that are considered essential for RinD implementation at three interconnected levels.

At individual level, the following competencies were identified:

- Planning competencies.** In particular, this refers to the ability to develop a theory of change and impact pathways together with stakeholders. The theory of change is used as a framework for understanding where and how to intervene systemically, for planning monitoring and evaluation of RinD initiatives, and to facilitate and document reflection on progress towards desired outcomes.
- Analytical skills that enable individuals to grasp complexity and embrace uncertainty and change in systems.** This includes analyzing and understanding the context of the development challenge or opportunity, as well as relationships between stakeholders and power dynamics within the aquatic agricultural system. It includes the ability to visualize, describe and analyze aspects of this system, such as farm systems, livelihood systems, value chains and innovation systems at local and national levels.
- Process competencies (social, communication and soft skills).** These allow people to work together. Examples include listening and communication; the ability to work within and lead teams, manage organizations, and facilitate multistakeholder processes; reconciling the knowledge of different stakeholders and science with other world views; and negotiating common objectives and respective roles and responsibilities (from different, sometimes conflicting positions).
- Learning and participatory action research competencies.** This refers to the ability to use social science research methodologies and participatory action research tools and techniques. All individuals implementing RinD need knowledge that goes beyond their disciplinary specialization and allows them to facilitate multistakeholder processes. Through participatory approaches, they need to be able to use and integrate different disciplines and combine scientific knowledge and procedures with local knowledge and experimentation capacity to produce results that improve rural livelihoods and income within the development context. In addition, individuals need a strong ability to track the learning and change process through documentation skills.
- Gender analytical competencies.** Individuals within teams need the ability to understand social and gender relations, the social norms that foster unequal power and inequalities in agriculture, and how these may influence development outcomes. They require the ability to include social and gender analysis in RinD initiatives.

At hub team and country team level, teams must have the functional skills (such as strategic planning, monitoring, evaluation and learning processes, and adoption of transparent decision making) for effective operations and be able to manage and combine the competencies of individuals and develop the teams' capability to do the following:

- **Create a learning culture.** This is done by encouraging team members to try out new things and take risks, and rewarding them for innovative practice, as well as dedicating time for reflection on experience and the documentation of lessons learned, particularly in terms of relationships with other partners.
- **Create enthusiasm and shared responsibility.** These go along with the ability to catalyze collective leadership in others.
- **Facilitate and enable interdisciplinary exchange and learning.** Organizing work teams around specific challenges central to the AAS hubs requires measures to create the (virtual or face-to-face) time and space needed for both formal and informal interaction between different disciplines and partners. Teams must be able to accept, manage and build on their inherent diversity.
- **Refine communications, linkages, knowledge sharing and working partnerships with other stakeholders in AAS hubs and beyond.** This means dedicating resources (time and budget) to joint activities, as well as producing information (written, audio and video) for partners, clients and users.
- **Build relationships with external actors.** This refers to the creation of legitimacy and influence, including the ability to influence policy to encourage an enabling policy environment.

At the innovation system (aquatic agricultural system) level, the program must create the conditions within which stakeholders, together with implementation teams, can make progress towards the goal and improve their own capacity (as described in detail in Box 2). These conditions must stimulate a new way of doing research in a collective effort to jointly develop solutions with communities, implementing organizations and external partners. This

includes establishing organizing mechanisms to bring stakeholders together and facilitate their interaction, enabling others to understand the larger system of which they are a part rather than pursuing fixes to individual pieces of that system. The system must have the capacity to shift the collective focus from reactive problem solving to co-creating the future.

Understanding RinD implementation teams in context

Building the capacity for implementation of AAS and its RinD approach started with the setup of the hub implementation teams, which are comprised of a combination of CGIAR research and support staff and partners located geographically in the hub and beyond. The range of partners involved in implementation of activities varies across the hubs, as is shown in Table 1. When referring to RinD implementation capacity, we are inherently talking about teams broader than the research centers with the mandate to do agricultural research. This point is significant for how capacity development is designed, given that it requires programs to move beyond performance of staff to understand performance of individuals as part of teams that work across organizations and institutional diversity. Understanding the teams requires an appreciation for the different organizational contexts within which they work and how they come together to achieve collective action.

As Table 1 indicates, there is a range in number and type of partners, with some hub teams including more research or academic partners, others having more development-focused partners, and some having more or fewer government agencies as partners. Given the diversity of contexts and composition of the teams in the five countries, varying degrees of RinD understanding and capacity were found to be present initially.

During the planning phase of the program in each hub, teams were supported through the stakeholder and community engagement processes. This support was provided by program and partner staff with a cross-hub or global supporting role, who co-facilitated events and shared the RinD approach with the teams. In some specific areas of implementation, such as community

Hub	Number	Type of partner	RinD implementation team members	
Barotse floodplain, Zambia	4	CGIAR Centers	WorldFish, International Water Management Institute, Bioversity, International Livestock Research Institute (from their headquarters, regional, national and field offices)	
	1	Traditional authority	Barotse Royal Establishment and local structures	
	2	International NGOs	Catholic Relief Services—Caritas, Concern Worldwide	
	3	Local NGOs	Peoples Participation Services, Tambalala Fish Marketers Cooperative Society, Zambezi Fish Conservation Association	
	3	Universities	University of Zambia, Columbia University, Wageningen University	
	1	Government agency	Ministry of Agriculture and Livestock	
	Total		14 organizations	
Khulna hub, Bangladesh	4	CGIAR Centers	WorldFish, International Water Management Institute, Bioversity, International Maize and Wheat Improvement Center (from their headquarters, regional, national and field offices)	
	1	International NGO	Helen Keller International	
	5	Local NGOs	Ashroy Foundation, Bangladesh Center for Communication Programs, Bangladesh Rehabilitation Assistance Committee, Sushilon, Society Development Committee	
	1	University	University of Khulna	
	Total		10 organizations	
Tonle Sap hub, Cambodia	3	CGIAR Centers	WorldFish, International Water Management Institute, Bioversity (from their headquarters, regional, national and field offices)	
	11	Local NGOs	Angkar Neary Khmer Organization, Aphiwat Strei (organization), Cambodian Organization for Women Support, Cambodian Rural Development Team, Culture and Environment Preservation Association in Cambodia, Dai Kou Kaksekor (organization), Gender and Development for Cambodia, Human Resources and Rural Economic Development Organization, Ponleu Koma (organization), Trailblazer Cambodia Organization, Village Support Group	
	3	Research organizations	Cambodian Agricultural Research and Development Institute, Analyzing Development Issues Centre, Inland Fisheries Research and Development Institute	
	1	University	Royal University of Phnom Penh	
	2	Government agencies	Fisheries Administration, Tonle Sap Authority	
	Total		20 organizations	
	Visayas-Mindanao hub, Philippines	2	CGIAR Centers	WorldFish, Bioversity (from their headquarters, regional, national and field offices)
2		NGOs	Farmers Community Development Foundation International, Catholic Relief Services	
3		Universities	Bohol State University, Jose Rizal Memorial State University, Visayas State University	
4		Government agencies	Bureau of Fisheries and Aquatic Resources, Department of Science and Technology, Local Government Unit, Philippine Agriculture and Resources Research Foundation	
Total		11 organizations		
Malaita and Western provinces, Solomon Islands	1	CGIAR Center	WorldFish	
	1	International research center	World Vegetable Center	
	3	NGOs	The Nature Conservancy, UN Women, Live and Learn	
	1	Local NGO	Kastam Gaden	
	6	Government agencies	Ministry of Fisheries and Marine Resources, Ministry of Environment, Climate Change, Disaster Management and Meteorology, Ministry of Development Planning and Aid Co-ordination, Ministry of Agriculture and Livestock, Malaita Provincial Government, Western Province Government	
	Total		12 organizations	

Table 1. Composition of RinD implementation teams in AAS hubs.

engagement, a partnership with the Belgian nongovernmental organization (NGO) the Constellation was put in place early on to explicitly build facilitation capacity for local teams engaging with selected communities. Capacity development at this stage of the process was largely focused through support for implementing planned activities.

Assessing RinD competencies to guide interventions

In 2014, when all hubs were functional, an RinD capacity assessment was conducted. The process was tailored to each hub context and attempted to build on existing events rather than creating a parallel process. To ensure ownership by hub teams, a facilitated participatory self-assessment methodology was used to develop specific RinD capacities and build on team strengths while identifying areas for growth.

The assessment began with a participatory exercise to ascertain how the elements of the RinD approach were understood and were being implemented by the teams. Enabling a context-specific articulation of the approach and relating it back to the generic program description of RinD led to several outcomes. First, it framed the RinD capacity development process in the language of the team, and second, it strengthened the team's confidence in their journey through implementation. It also enabled a leveling off of any different contextually specific views of RinD. One area that we found teams to be lacking sufficient understanding of across hubs was the use of the program's gender-transformative approach.

Having come to a collective agreement on the RinD approach, teams then reflected on their implementation experience in order to identify areas of strength and weakness based on their concerns as RinD practitioners. The generic list of individual competencies for RinD was discussed with participants and amended according to the team's contextualized view of RinD and the competencies they required for successful implementation of their program of work in the hub. (See Annex 1 for the full list of individual competencies used.) The resulting list of hub-defined core RinD competencies was then used by each team member in an individual self-assessment. Team members then

shared their findings with their colleagues as a way to begin building a collective view of the capabilities found within the team.

Individual skills and knowledge sets, however, cannot be addressed without also addressing the wider team setting in which they are embedded and their role in developing the capacity of the overall innovation system they are engaging with. Assessing the capabilities of the team proved more difficult, as these could not easily be checked against a list and required teams to reflect not only on functional aspects (official mandates and goals, formal procedures and structures) but also on how the competencies of individuals are integrated and combined, cross-disciplinary learning is enabled, and change processes are documented. "Political" dimensions such as power, incentives, tensions and conflicts also need to be considered, as do intangible qualities such as trust building, enthusiasm and confidence. These dimensions provide the impetus that brings motion, purpose, direction and change to the teams.

The final step in the self-assessment process was a team prioritization exercise. Based on their individual self-assessments and the discussions around team capabilities, teams identified the areas of individual competency that they felt motivated to build their own capacities in and requested support for. The synthesis view from across all hubs is shown in Figure 1.

Teams across all contexts prioritized process and gender competencies for ongoing capacity development. Within the broad area of gender competencies, teams indicated the need to build their understanding of the program's gender-transformative approach and their ability to use it towards achieving program outcomes. Within the general area of process competencies, teams identified three specific competencies to focus on: (i) conflict management, (ii) process documentation, and (iii) facilitation and engagement with stakeholders—all critical to implementing RinD with stakeholders. Building competencies in planning was also identified as a priority—in particular, capacity to use a theory of change (and specifically participatory development of a theory of change with partners) and using the learning that emerges from program monitoring and evaluation to adapt implementation.

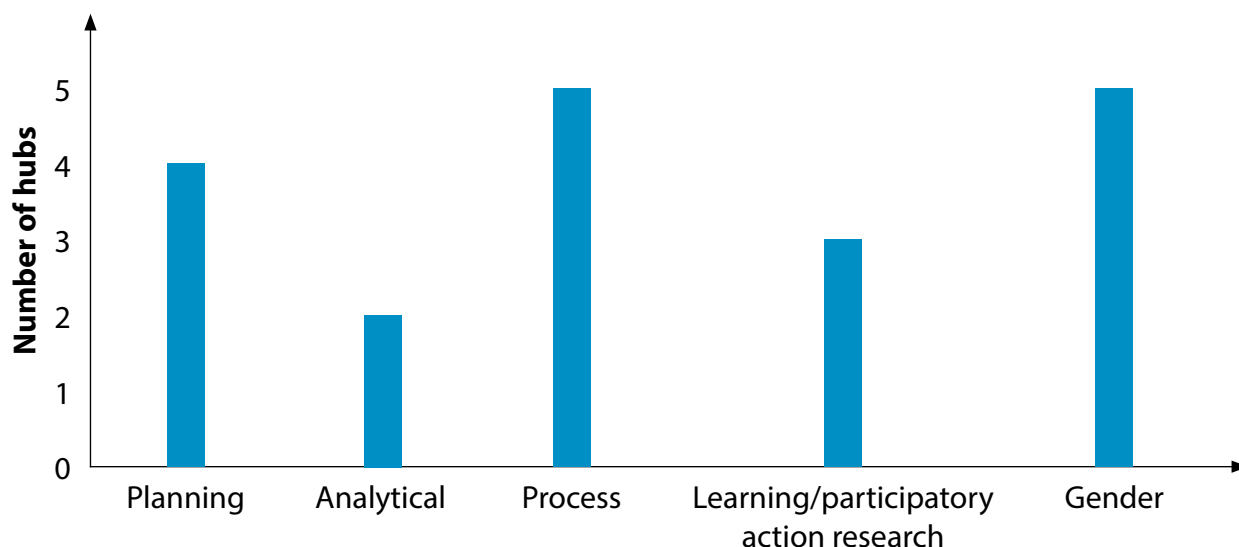


Figure 1. Synthesis of core RinD competency areas to focus capacity development.

Most teams expressed comfort with their current competency levels within the learning and participatory action research areas and in particular in facilitating community engagement. Given that it is the area in which teams had received the most support and training, this is not surprising. They did, however, indicate the need to build more rigorous social science skills around their participatory action research process and to improve documentation and use of communication tools. (This overlaps strongly with the process documentation skills prioritized under the process competencies.)

The analytical competency area was considered the least important for capacity development by hub teams; however, those that did prioritize it identified management of power relations and understanding system change as important. Both of these areas are related to other priorities identified, such as the use of a gender-transformative approach and research skills within participatory action research that call for analysis of power relations. Capacity development is an iterative process, and the articulation of hub team needs will evolve as they continue to implement the program. It is likely that as they deal with new challenges and need to adapt in order to respond to uncertainty and emergent phenomena, analytical competencies for systems work will become increasingly important.

Responding through blended learning

Targeted interventions to respond to the needs and motivations of teams are implemented through a multilevel blended learning

methodology. The methodology has been described in the gender capacity development and organizational change conceptual framework (Sarapura and Puskur 2014). The framework argues that by supporting teams who are implementing an evolving and complex program, there is need to move beyond delivery of training. The blended learning methodology focuses on facilitating three dimensions of learning: formal learning or building new knowledge (learning for action), on-the-job learning (learning in action) and learning from experience (learning from action). Given the nested nature of individuals, teams and organizations, strategies should be developed for facilitating all dimensions of learning at all levels.

Since AAS inception, learning in action (on the job) has been the main modality for implementing capacity development. Table 2 illustrates the total number and focus of learning activities that have contributed to capacity development of hub teams, illustrating that the majority (55%) fall within the learning-in-action focus. The learning- from-action activities have been implemented through facilitated reflection workshops during which teams reflect upon their own capacity development.

Given the newness of the gender-transformative approach within RinD, a gender-specific capacity development process was launched early on, starting with a gender scoping study carried out with all WorldFish country offices. The scoping study illustrated that there is

Location	Number of activities contributing to RinD capacity development			
	Learning for action	Learning in action	Learning from action	Total
Global cross-hub events	7	0	3	10
Khulna hub, Bangladesh	3	7	1	11
Tonle Sap hub, Cambodia	5	10	1	16
Visayas-Mindanao hub, Philippines	2	6	1	9
Malaita and Western provinces, Solomon Islands	5	7	1	13
Barotse floodplain, Zambia	2	10	2	14
Total	24	40	9	73

Table 2. Number and focus of learning activities that have contributed to RinD capacity development of hub teams between 2012 and 2014.

strong commitment to gender across levels within the organization, but that most country teams are not yet able to integrate gender into their ongoing research areas and require further support to understand the gender-transformative approach. These results align with findings from the RinD assessments, where gender was defined as one competency area for which teams requested more support.

Two global partnerships were established to respond to the need to develop capacity of teams in integrating gender through using gender-transformative approaches. Gender specialists that form part of the global RinD support team designed and co-facilitated learning events in all hubs with partners, as described in Box 3. Team meetings bringing together all gender specialists in the program have also provided opportunity to share learning across hubs and facilitate collective learning from action.

A summary of the topics covered through targeted capacity development interventions and their methodology in each hub is shown in Table 3. Some of these interventions responded to specific findings of the assessments carried out, while others are part of ongoing global RinD support to hub teams and illustrate the blended learning methodology in use.

Box 3. Gender capacity development activities implemented through program partnerships

Partner activities involved training in gender, use of gender-transformative approaches, and design for gender-transformative research and learning through sharing experiences from the field.

- Promundo-United States supported gender coalition and network building in hubs and has delivered trainings to integrate gender-transformative approaches and test approaches to engaging men in selected initiatives in two hubs (Barotse floodplain in Zambia and Tonle Sap hub in Cambodia). They will continue this work in Bangladesh and Solomon Islands in 2015.
- Collaboration with the University of East Anglia aims to strengthen the gender and social science research capacity of staff and key partners in the hubs. Scientific writing and advanced analytical skills are their main focus. In 2013, a gender summer school was implemented, bringing together gender specialists from across all hubs for a 15-day course.



Hourt Chreb, AAS community facilitator in Raing Til village, facilitates the dream-building process in her community using the Community Life Competence Process, Cambodia.

Hub	RinD competency	Methodology
Tonle Sap hub, Cambodia	Learning and participatory action research	On-the-job support by external consultant as the team operationalized a participatory action research methodological guide, facilitating their reflection, learning and adaptation, as well as coaching team leaders in participatory action research skills
	Planning: Theory of change	Global RinD support through two co-facilitated workshops with hub implementation team members to develop theories of change with stakeholders
	Gender: Understanding and using a gender-transformative approach	Training on the gender-transformative approach by Promundo in partnership with a local gender NGO
Visayas-Mindanao hub, Philippines	Learning and participatory action research	Training conducted by WorldFish Philippines staff on participatory action research methodology for all implementing partners and teams
	Planning: Theory of change	Global RinD support through two co-facilitated workshops with hub implementation team members to develop theories of change with stakeholders
	Process: Conflict management skills	Conflict management training conducted by a local Philippines partner
Khulna hub, Bangladesh	Learning and participatory action research	Training by WorldFish staff and on-the-job support for implementation of participatory action research (including documentation for research output) on specific agricultural concerns of communities
	Planning: Theory of change	Training on theory of change for implementation team
Barotse floodplain, Zambia	Learning and participatory action research	Ongoing support to implementation teams on facilitation skills, planning and documentation for participatory action research processes
	Planning: Theory of change	Global RinD support through two co-facilitated workshops with hub implementation team members to develop theories of change with stakeholders
	Gender: Understanding and using a gender-transformative approach	Training on the gender-transformative approach by partner Promundo
Malaita and Western provinces, Solomon Islands	Planning: Theory of change	Global RinD support through two co-facilitated workshops with hub implementation team members to develop theories of change with stakeholders
	Learning and participatory action research	Participatory action research training workshop conducted by external consultant and global RinD support team for partnership on sustainable farming and nutrition

Table 3. RinD capacity development interventions in AAS hubs 2013–2014.

LEARNING AND IMPLICATIONS FOR RinD CAPACITY DEVELOPMENT

In this section, we reflect upon the lessons learned through taking a systems approach to capacity development within the RinD approach used by AAS in its first few years of implementation. Learning is discussed in relation to future implementation of capacity development within the program as well as looking beyond AAS to inform strategies of other agricultural research programs focused on building systems capacity to innovate.

A major lesson from the definition of RinD competencies and the team assessments implemented in five different hubs is the need for teams and individuals to embrace ambiguity as an intrinsic element of working within RinD. We have found that developing this ability is often challenging within the institutional structures and systems in which RinD team members work. On the one hand, working in agricultural innovation systems through RinD calls for the ability to accept that change emerges out of diverse interactions and opportunities on the ground and can seldom be controlled. On the other hand, as members of CGIAR Centers or other implementing organizations, the team members' institutional setting defines their roles and responsibilities and uses accountability and performance mechanisms to monitor how they achieve set objectives. Their institutional setting favors a controlled and linear reality. There is an inherent tension, therefore, in implementing RinD and building capacity to do so that cannot be overcome by favoring one system over the other. Rather, it requires ongoing dialogue within teams to ensure individuals and teams perform within the institutional boundaries while also engaging with the more fluid external environment they are embedded in.

In response to this learning, an important next step for AAS RinD capacity development is to engage further with the organizational spheres within which teams are embedded (CGIAR Centers, NGOs and government institutions) and work with team leaders to build their capacity to manage the inherent tension that comes with RinD. These deeper team-building and organizational change exercises will require a high level of trust and confidence

within the team and willingness to participate. Implementing learning from action on RinD through facilitated reflection workshops is one way to institutionalize the team-building processes required to reflect and build skills. This should be embedded within the ongoing implementation of participatory action research that is part of the annual cycle of planning, reflecting, and monitoring and evaluation. Further, team RinD capabilities can become the basis for developing indicators for teams to track their own movement towards achieving their goals and continue to highlight areas where more targeted support is required. For example, a team might define what a learning culture looks like for them in their context, such as the number of times they discuss things that have not gone according to plan and surfaced learning from their experience in team meetings. The conceptual framework for gender capacity development and organizational change explicitly situates capacity development for the gender-transformative approach of RinD within the need for organizational change processes. This should be pursued in future implementation.

A second area of learning is around the need to make the capacity development process more explicit within the program while at the same time maintaining a focus on on-the-job support. One of the strengths of the approach taken to implementation of RinD overall has been the structuring of implementation teams as nested across program levels, which is leading to capacity being built through learning from action as team members work together to implement activities with stakeholders in context. Evidence that this is working includes the 2014 external evaluation of AAS, which found the high level of commitment among team members and the institutionalization of learning processes to be program strengths. This indicates that the capacity development strategy, which is based on supporting through implementation, has been successful in building strong program teams. The 2014 RinD capacity assessment process has also illustrated areas where hub teams continue to feel challenged (such as the gender-transformative approach and theory of change competencies)

and would like more targeted support. We now have a clearer view of the specific competencies required by specific team members, as well as where they are motivated to focus their own energy to build capacity.

With the blended learning methodology clearly articulated, there is opportunity to respond to more specific requests from hub teams by developing tailored and targeted interventions that can build team capacity. The RinD support team does so through a loosely organized system based on support to areas of work across hubs (gender specialists help gender work, participatory action research specialists support participatory action research, etc.). Developing a more explicit mentoring system could be one strategy to more clearly link those with specific competencies to those who need to build them and provide more opportunity for learning from action through ongoing reflection with a mentor. To do this, those who provide support and build capacity on the job should be more explicit about their intent to build capacity of specific individuals in implementation teams in specific competency areas. How to evolve the current loosely defined

RinD support network into a more structured support network will require ongoing discussions and reflection on what is working in hubs.

Emerging understanding of RinD capacity as process and outcome

Through initial RinD capacity development work, we now have greater conceptual and practical understanding of the relationship between developing capacities to implement the RinD approach effectively through working with individuals, teams and organizations and our longer-term RinD goal of enabling system capacity to innovate as an AAS intermediate development outcome. Further articulation of this relationship is critical for developing a meaningful and effective monitoring and evaluation system for capacity development that is embedded within the program's broader research questions on how RinD builds capacity to innovate in different contexts. Figure 3 illustrates graphically our emerging understanding of this relationship.

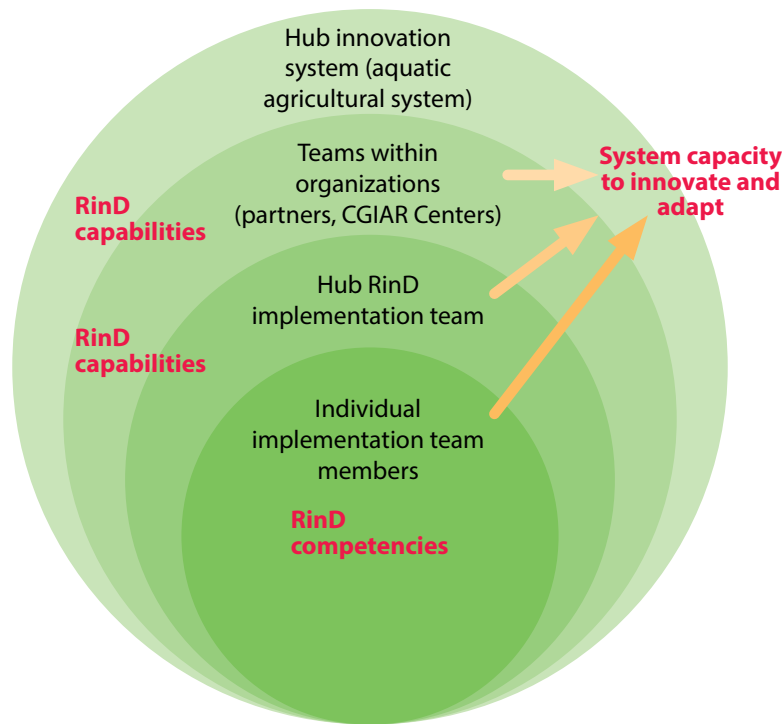


Figure 3. Relationship between RinD competencies, capabilities and capacity, and system capacity to innovate within AAS hubs.

As is shown in Figure 3, RinD capacity is nested across individuals, teams and organizations that are all part of the hub innovation system. A program implementing RinD has the greatest ability to influence the individuals and teams responsible for implementation. At the core, therefore, are the RinD competencies of the individuals who implement RinD in AAS and form part of the hub implementation team. This team requires RinD capabilities and is embedded within program country implementation teams through the organizations that employ them. The team capabilities are built less directly through engagement with organizational spheres. Capacity development activities include assessments of competencies, development and implementation of tailored plans using blended learning, and the institutionalization of reflection and learning on capacity.

The implementation teams use their competencies and capabilities to implement interventions that are part of the RinD program of work in the hub. As they do so, they engage with the innovation system and the stakeholders that form part of the hub. At this level, the aim is to enable system capacity to innovate as an intermediate development

outcome of the program. This view creates an integral process that links development of the capacity to support quality implementation with achieving capacity as an outcome in the innovation system.

For example, in the AAS Barotse floodplain hub in Zambia, a fish value chain initiative was designed with stakeholders to tackle local and system-level challenges of fish productivity, postharvest losses and access to markets. Its implementation brings together stakeholders to analyze the value chain and, through a participatory action research process, to identify specific actions (both research and development) to unlock the potential of the value chain. A resulting area of work from the stakeholder discussion is postharvest fish processing and the testing of fish salting technologies to reduce postharvest loss. Integrated into the technology interventions is the analysis of gender norms such that transformative outcomes for men, women, and the resource-poor and marginalized become possible. The implementation team is comprised of staff from CGIAR Centers, NGO partners, staff of the Ministry of Agriculture and Livestock, and community facilitators.



Women in aquaculture, Bangladesh.



Women participating in a workshop in Tramer village, Pursat Province, Cambodia.

The RinD competencies they bring to bear on this challenge include facilitation skills to guide the participatory action research processes, within which they develop and periodically revise theories of change to understand the changes that are unfolding so they can adapt their implementation strategies. Further, they use their social and gender analysis skills and their ability to support critical reflection to build transformative potential through the technological interventions.

Some of these competencies existed in the teams beforehand, while others were developed through capacity-development interventions—for example, on-the-job support as they facilitate and implement fish salting participatory action research processes.

The example illustrates how RinD capacity development and enabling capacity to innovate are not occurring sequentially during implementation but rather are happening simultaneously through the systems approach used. This reality presents the opportunity to understand capacity development as directly supporting capacity outcomes.

The key message for programs that aim to build capacity to innovate from the AAS experience thus far is that capacity development to support quality implementation is a central part of how the program as a whole can achieve capacity as an outcome. These two areas of work, which have previously been considered by different specialists and managed through separate departments, should be more integrated. The monitoring and evaluation of capacity development should look beyond just improving performance, and the evaluation of achieving capacity as a system outcome should be cognizant of the role of capacity development internally. By bringing these two aspects together, programs can support greater innovation capacity and continuously improve their understanding of how to do so better.

- ¹ Complex social-ecological systems involve multiple and nonlinear interactions between human and natural components linked and interconnected to cause–effect relations through social institutions, practices and governance processes. Social and ecological dimensions co-evolve across spatial and temporal scales.
- ² In AAS, hubs are defined as geographic locations providing a focus for innovation, learning and impact through action research.
- ³ See Leeuwis et al. (2014) for more on a system’s capacity to innovate.
- ⁴ This view of capacity development within the AAS approach to RiD, linked to intermediate development outcomes, is in line with recent thinking in CGIAR that argues for embedding capacity development in broader CGIAR research program strategies through theories of change and impact pathways.
- ⁵ Described as a linear technology development, or the “pipeline” approach (Sumberg 2005), the “central source of innovation” model (Biggs 1990) does not consider the role of facilitation.
- ⁶ Institutions as used here refer to the rules and regulations (both formal and informal), mandates, strategies, and policies, but also frameworks for understanding, values and beliefs, customs, cultural norms, and incentives that govern and shape how individuals and organizations relate and interact.

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ANNEX 1. CAPACITY NEEDS SELF-ASSESSMENT OF INDIVIDUAL HUB MEMBERS

RinD competency areas that guided the self-assessment process

Planning competencies
Use theory of change for planning, monitoring and evaluation of RinD initiatives
Develop a theory of change and impact pathway together with stakeholders
Facilitate and document reflection on progress towards outcomes
Analytical competencies
Understand and analyze relationships between stakeholders and power/political dynamics in aquatic agricultural systems
Visualize, describe and analyze aspects of aquatic agricultural systems: farm systems; livelihood systems; value chains; innovation systems at local and national level
Analyze the context of a given development challenge (problem or opportunity)
Process competencies
Listen, communicate, give and receive feedback
Manage conflicts between stakeholders and within teams
Design and adapt process to multistakeholder needs in context
Facilitate a multistakeholder group to arrive at common goals and plans
Build relationships with key stakeholders to strengthen networks and partnerships
Learning and participatory action research competencies
Understand and use experiential learning principles and practices
Track and capture learning from multistakeholder processes as part of participatory action research and participatory monitoring and evaluation
Ensure inclusion of and accommodate diverse perspectives
Gender competencies
Understand social and gender relations and inequalities in agriculture and how these influence development outcomes
Understand the gender-transformative approach and its role in RinD
Include social and gender analysis in RinD initiatives



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About the CGIAR Research Program on Aquatic Agricultural Systems

Approximately 500 million people in Africa, Asia and the Pacific depend on aquatic agricultural systems for their livelihoods; 138 million of these people live in poverty. Occurring along the world's floodplains, deltas and coasts, these systems provide multiple opportunities for growing food and generating income. However, factors like population growth, environmental degradation and climate change are affecting these systems, threatening the livelihoods and well-being of millions of people.

The CGIAR Research Program on Aquatic Agricultural Systems (AAS) seeks to reduce poverty and improve food security for many small-scale fishers and farmers depending on aquatic agricultural systems by partnering with local, national and international partners to achieve large-scale development impact.

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