

## Monitoring and Evaluation Strategy Brief



RESEARCH  
PROGRAM ON  
Aquatic  
Agricultural  
Systems

# MONITORING AND EVALUATION STRATEGY BRIEF

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# LIST OF ABBREVIATIONS

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AAS	CGIAR Research Program on Aquatic Agricultural Systems
IDO	Intermediate development outcomes
M&E	Monitoring and evaluation
MSC	Most significant change
PAR	Participatory action research
PEG	Program Evaluation Group

# INTRODUCTION

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This brief provides an overview of the monitoring and evaluation (M&E) system of the CGIAR Research Program on Aquatic Agricultural Systems (AAS) and describes how the M&E system is designed to support the program to achieve its goals. The AAS program aims to improve the lives of 22 million people dependent upon aquatic agricultural systems by 2024 through research in development. The program's approach is built on six key elements: commitment to people and place, participatory action research, gender transformative research, learning and networking, partnerships, and capacity building (Dugan et al., 2013). The program works with stakeholders in geographically defined hubs to tackle development challenges relating to aquatic agricultural systems.

The brief is organized into three sections. First, we present the objectives of the AAS M&E system in keeping with the key program elements. The second section introduces the theory we draw upon to design the M&E system, and in the final section, we describe the system components.

There are five objectives that guide the design of the AAS M&E system, to fulfill accountability expectations, monitor outcomes, contribute to learning and adaptive management, contribute to research on how change happens, and be credible, useful, and cost-effective.

## Fulfill accountability expectations

Fulfilling accountability expectations means putting in place the processes and practices that enable us to keep all our stakeholders informed of our work, take into account and balance their interests, and ensure equitable responses to their concerns (Whitty, 2008). AAS stakeholders include farmers and fishers, hub actors, and donors that support our work. The AAS M&E system provides information and supports processes that ensure accountability.

## Monitor outcomes

The AAS program carries out research to achieve development outcomes<sup>1</sup> - specifically, outcomes relating to productivity, nutrition, income, gender and empowerment, capacity to innovate, and adaptive capacity (AAS, 2013). Our progress towards these outcomes is an important measure of the success of our approach and program. The M&E system measures this progress and carries out evaluation research to understand how this progress is made.

## Contribute to learning and adaptive management

The AAS program operates in complex systems where technical expertise is often not sufficient, relationships matter, results are uncertain, and learning to apply and adapt principles is key (Patton, 2011). To achieve development outcomes in this setting, the AAS M&E system supports learning that contributes to adaptive management.<sup>2</sup> Moving beyond traditional problem solving and enabling deeper and more lasting adaptation and

transformative change<sup>3</sup> in aquatic agricultural systems requires reflection and feedback that is constructively critical and can respond to emerging opportunities. The AAS M&E system, therefore, is designed to create an atmosphere where participants feel comfortable engaging in critical self-reflection, and provides specific opportunities to engage in this self-reflection and document the process.

## Contribute to research on how change happens

Working in complex agricultural systems means that what works in one place will not necessarily work somewhere else. Understanding the effect of context on how research does and does not lead to intended and unintended outcomes is an important topic of inquiry. Research on this topic can contribute to improving program design and to innovation, extension and scaling literatures. The AAS M&E system pursues this objective by testing and adapting theories of change during implementation via participatory action research (PAR), and by using the resulting learning to contribute to adaptive management.

## Be credible, useful, and cost-effective

If the AAS M&E system is to be successful, people inside and outside the program must see it as credible, useful, and cost-effective. All too often, M&E systems become bureaucratic burdens that end up thwarting creativity, ambition, and the flexibility to respond to opportunity (Biggs and Smith, 2003). Poorly designed systems gather information without a clear use in mind, which means that this information is either not used at all or, if used, does not yield valuable insight. In either circumstance, researchers come to see M&E as a box-ticking exercise with no value for reflection or learning. Recognizing these dangers, we are designing an M&E system that is integrated into the program planning cycle so that the M&E information and insights may be used by stakeholders involved in planning, funding, and implementing the program.

<sup>1</sup>“Outcome” derives from the terminology of results-based management literature. Outcomes happen when users use outputs. They are typically measured by changes in users’ knowledge, attitudes, skills, or practice.

<sup>2</sup> Adaptive management recognizes uncertainty and change, using systematic learning and deliberate experimentation to improve management practice and deal with continual change (Lee, 1993).

<sup>3</sup> Transformative change is a key program objective necessary for achieving sustainable and equitable outcomes. The program approach to transformative change is described in Kantor and Apgar (2013).

# THEORY AND METHODOLOGICAL INNOVATION UNDERPINNING MONITORING AND EVALUATION

Our explicit recognition that the AAS program works in complex settings requires a greater emphasis on learning and adaptive management than is the norm in most other CGIAR research programs. This situation requires methodological innovation. Such innovation often comes through combining concepts and ideas from different fields (Axelrod and Cohen, 1999; Fonseca, 2002). Our M&E system is built on theory and practice from two fields: theory-based evaluation and participatory action research. Theory-based evaluation (e.g., Rogers et al., 2000) specifies theories of change<sup>4</sup> that are tested and modified through evaluation. A theory of change of a program is a model of the causal pathways that link program activities to outcomes, which are defined as changes in knowledge, attitudes, skills, and behaviors of key actors. A theory of change is built on a set of assumptions about how we think change happens and how we think we influence it. A key premise is that testing assumptions during implementation will help us learn, improve, contribute to adaptive management, and so increase our likelihood of achieving development outcomes. Hence an important part of our M&E system is developing theories of change and testing them through cycles of reflection, planning, and action. Participatory action research<sup>5</sup> provides both the methodology for us to test theories of change together with key stakeholders and the rigor required to be credible (Lennie, 2006).

Looking forward, we develop theories of change to build commitment, common purpose, and agreement on the broad outcome pathways a program component will follow. Looking back, we develop theories of change with as much detail as is necessary to establish whether and how program efforts contributed to change (see Mayne, 2008, on contribution analysis).

We will employ cross-case comparisons using case study methodology (e.g., Yin, 1989) to test the premise that setting up and testing theories of change supports learning, adaptive management, and innovation. It is also our main research methodology to gain understanding of how the AAS research in development approach is working.

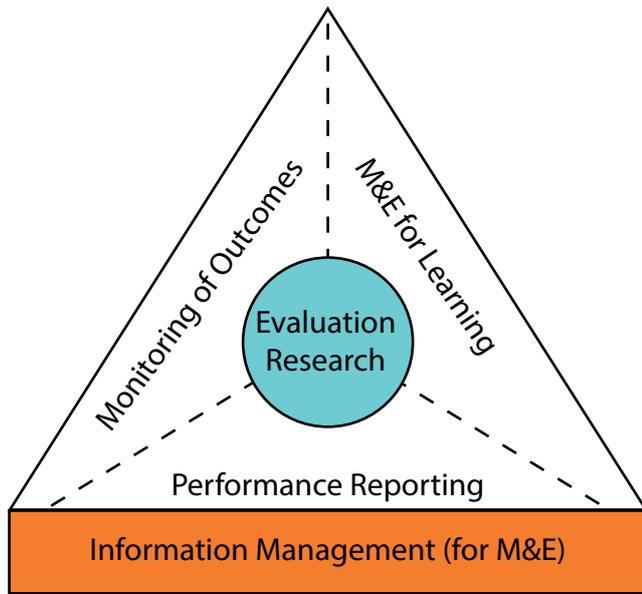
Our design of impact evaluations is guided by an overarching evaluation framework that answers impact evaluation questions by selecting appropriate evaluation designs that take into account program attributes (Mayne et al., 2013). We are developing methods to measure progress in building capacity to innovate and capacity to adapt, in rural communities.

<sup>4</sup> The working paper Using Theory of Change to Achieve Impact in AAS describes how we are *using theories of change in the AAS program* in more detail.

<sup>5</sup> See Reason and Bradbury (2008) and Greenwood and Levin (1998) for comprehensive reviews of the diversity of approaches within the field of PAR.

# COMPONENTS OF THE MONITORING AND EVALUATION SYSTEM

The AAS M&E system has five components, shown in Figure 1. In the center are the three different types of M&E we distinguish: performance reporting, monitoring of outcomes, and M&E for learning. The other two relate to how we manage and use information and insight generated through M&E: information management and evaluation research.



**Figure 1:** AAS M&E framework

Each component has its own tools and approaches, shown in Table 1. It is through all five elements that the AAS M&E system will contribute to adaptive management and the AAS goals. We now look at each element in turn.

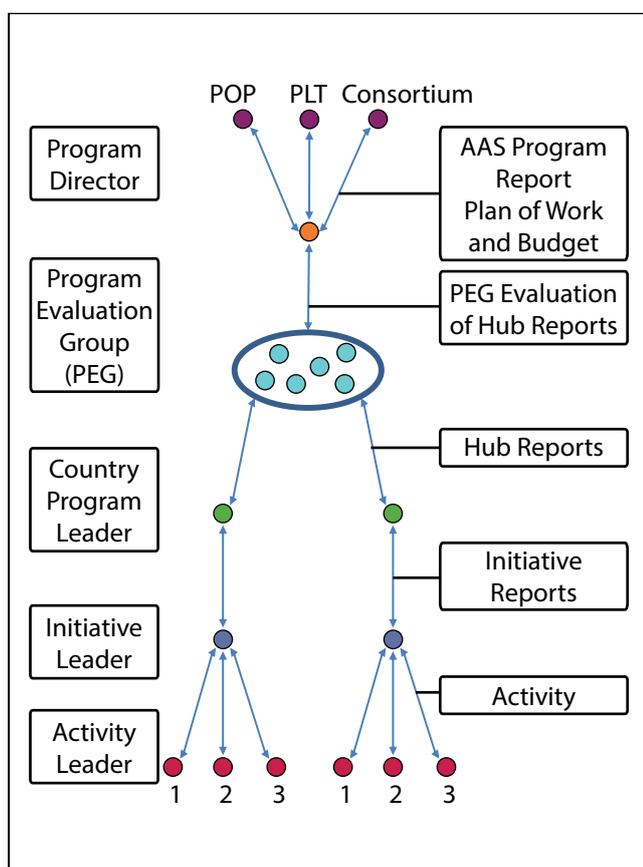
Component	Tools and approaches
Performance reporting	Interlinked six-monthly planning, reporting, and feedback at initiative, country, and program level
Outcome monitoring	Establishing baselines Adoption surveys Most significant change
M&E for learning	After-action reviews Bi-annual review and reflection events Participatory development and monitoring of theory of change
Information management	Management of PAR documentation Setting up and managing online data repositories that facilitate performance reporting
Evaluation research	Impact evaluations M&E method development PAR on how change happens in AAS initiatives and communities Cross-case comparisons and case study research

**Table 1:** AAS M&E system components and their tools and documentation

## Performance reporting

Performance reporting fulfills the AAS program's basic accountability requirement to demonstrate that it is spending funds according to the agreed Program of Work and Budget.<sup>6</sup> Performance reporting describes the substance and process by which contributors in different parts of the program plan activities, agree on milestones, and report progress towards them. It includes providing evaluative feedback and describing the steps taken in response to this feedback at different levels within the program.

Performance reporting is hierarchical, as Figure 2 shows. Reports flow up and feedback flows down. Performance reporting is the foundation of the AAS M&E system.



**Figure 2:** Information flows in AAS performance reporting

## Monitoring of outcomes

Monitoring of outcomes tracks the progress the program is making towards achieving its goal of benefiting 22 million people by 2024. The AAS program has agreed with other CGIAR research programs on a common set of intermediate development outcomes (IDOs) by which this progress is to be measured (AAS, 2013). The AAS program's IDOs include improvements to: productivity, income, nutrition, and capacity to innovate. Outcome monitoring includes establishing baselines for these IDOs in our focal villages and performing subsequent mid-line and end-of-line surveys to measure change. Outcome monitoring also includes use of the most significant change (MSC) approach to identify unexpected outcomes. It includes adoption surveys that seek to quantify and understand the spread of AAS technology and influence within and beyond hubs. Findings from monitoring of outcomes feed into performance reporting and inform reflection carried out in M&E for learning.

## M&E for learning

The AAS program will achieve its goals through a research approach embedded in and linking to hub development processes. The hubs are complex and evolving systems. This context requires that the AAS approach evolves if it is to be effective in contributing to development outcomes. AAS M&E for learning supports this continual development and innovation. In this sense, it is similar to developmental evaluation defined by Patton (2011, p. 1) as supporting "innovation development to guide adaptation to emergent and dynamic realities in complex environments".

One of the ways that the AAS program puts M&E for learning into practice is through the participatory development and testing of theories of change (Douthwaite et al., 2007). In this process, hub stakeholders plan what they will do after first making explicit how they think their actions will lead to the change they want to see. These assumptions are expressed in a theory of change. Regular reflection informed by outcome monitoring allows stakeholders to learn if the assumptions are valid. The theories of change are developed and tested at community, initiative, hub, and program levels using PAR principles (Box 1).

<sup>6</sup> The Program of Work and Budget (POWB) is the main accountability mechanism of all CGIAR research programs, including the AAS program.

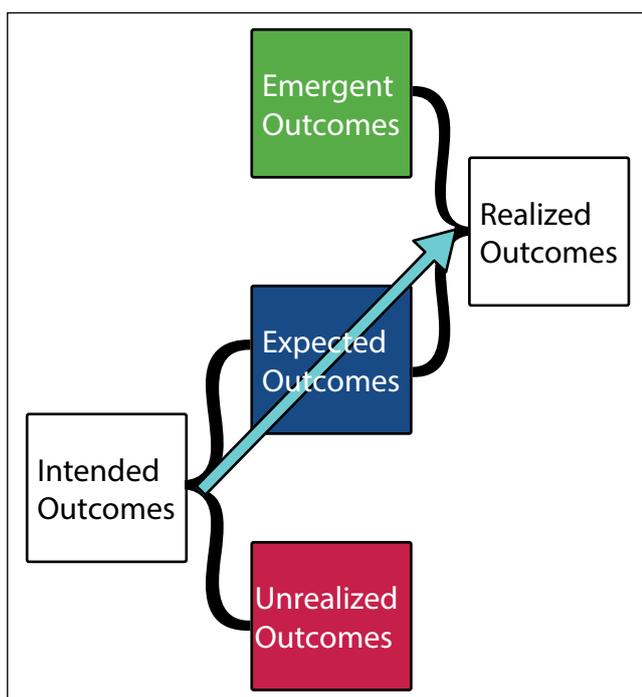
**The M&E for learning process:**

1. ... is owned by the participants, who define their real-life problems to be addressed through PAR.
2. ... recognizes multiple voices and power relations and, to ensure equity, requires facilitation to be mindful of who is participating and how they are participating.
3. ... emphasizes jointly shared responsibilities for collecting data and its analysis to support improved understanding and actions.
4. ... feeds results back to the participants for ongoing learning that is potentially transformative.

Source: Apgar and Douthwaite (2013)

**Box 1:** Principles that guide participatory action research in AAS applied to M&E for learning

The AAS program will be successful through both expected and emergent outcomes, as shown in Figure 3. Conventional M&E views unrealized outcomes as failures and does not expect emergent outcomes. In the AAS program, we know we work in complex and evolving contexts, so we explicitly expect unrealized outcomes and emergent outcomes. M&E for learning is the main mechanism by which we learn from the first and identify and understand the second. Dealing with unrealized and emergent outcomes is part of adaptive management.



**Figure 3:** Types of AAS outcomes (adapted from Mintzberg and Waters, 1985)

## Information management

The overall performance of the AAS M&E system will depend on information flows between the individual components. For example, learning about emerging outcomes needs to feed into performance reporting and subsequent planning. Without this link, M&E for learning will not lead to adaptive management and program improvement, which will make it harder for the AAS program to achieve its outcome targets. M&E for learning requires safe spaces for people to reflect and be self-critical, which means that certain information should not be taken out of context. What data is available and how it is presented will influence learning and evaluative decision-making. Monitoring will identify outcomes that will be of interest to communicators. The list of links goes on. Information management is not usually included as a part of an M&E system. However, if AAS M&E is to be useful, cost-effective, and contribute to adaptive management, good information management is essential.

## Evaluation research

Evaluation research is a rigorous, systematic process that involves collecting data about organizations, processes, programs, services, and/or resources to enhance knowledge and decision-making that leads to practical applications (Powell, 2013). The data for our evaluation research comes from AAS M&E. We conduct several types of evaluation research, including the development of M&E methods and tools, research to understand how change happens, and ex-post impact evaluations. The knowledge generated through evaluation research feeds back into the M&E system itself and supports its continued improvement.

In understanding how research can support development processes, the AAS program offers a particular opportunity to contribute to knowledge. The AAS program currently has five hubs in Africa, Asia, and the Pacific, with an average of five initiatives per hub. Each initiative develops and tests theories of change during implementation. This represents 25 cases, with more being added each year as the AAS program grows. Comparing and contrasting across these similarly constructed cases will help give us an insight into how change happens and provide us with a body of international public goods in the form of contributions to the innovation, extension, and scaling literatures.

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The CGIAR Research Program on Aquatic Agricultural Systems is a multi-year research initiative launched in July 2011. It is designed to pursue community-based approaches to agricultural research and development that target the poorest and most vulnerable rural households in aquatic agricultural systems. Led by WorldFish, a member of the CGIAR Consortium, the program is partnering with diverse organizations working at local, national and global levels to help achieve impacts at scale. For more information, visit [aas.cgiar.org](http://aas.cgiar.org).

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