

Project Methodology Brief

Turning tragedy into opportunity: Water management solutions for flood-recession and dry-season agriculture in Nigeria

The goal of this project is to assist the Government of Nigeria to increase agricultural production and achieve food security through sustainable water management, which allows smallholder farmers to profitably engage in flood-recession and dry-season agriculture.

The three-year project will establish fact-based evidence on historical and current flooding patterns and risks as a guide to decision making on flood response. It will also identify flood capture and storage solutions for flood-recession agriculture and dry-season farming. The project will be implemented in the Nigerian states of Anambra, Benue and Kogi.

The project has emerged from discussions held between the Federal Ministry of Agriculture and Rural Development of Nigeria and the International Water Management Institute (IWMI). Both of these parties are keen to explore opportunities in Nigeria to simultaneously:

- reduce the risks posed by flooding through accurate forecasting systems and mitigation plans, including putting flood water into productive agricultural use; and
- improve and enhance dry-season farming through integrated Agricultural Water Management (AWM) solutions, helping to increase the country's agricultural output and food security.

To identify solutions for improving AWM and ultimately smallholder livelihoods, the project will use a set of complementary methodologies. One of these will be the **Participatory Rapid Opportunities and Constraints Analysis** (PROCA) framework. The framework provides a systematic analysis of different types of innovations (technologies, products and practices), and can be used for project planning, monitoring or ex-post evaluation.

Putting PROCA into action

PROCA has three basic steps (see Table 1). The steps are not necessarily linear and all may not be needed to identify appropriate innovations. It depends on whether the innovations under consideration are software (e.g., policy changes) or hardware (e.g., small-scale irrigation technologies), and how well they are tested. In addition, the steps can be adjusted to suit *ex-ante* or *ex-post* evaluations.

Table 1. The three interactive steps of PROCA

Step	Activity	Methods	Key evaluation criteria	Outputs
Step 1: Situational analysis and initial screening	Identification and prioritization of possible AWM solutions.	Literature reviews, secondary data collection and analyses, surveys, gender mapping, priority setting using scoring and ranking techniques.	Impact potential, gender-equity, scale potential, implementation pathway (ex-ante).	Menu of AWM solutions for detailed investigation.
Step 2: In-depth study to analyze opportunities and constraints	Further evaluation of AWM solutions that passed step 1.	Field research, modeling.	Access, economics, social and institutional dynamics, backwards linkages, forward linkages, resource sustainability, externalities.	Proven AWM solutions for dissemination.
Step 3: Analysis of out-scaling impacts	Analysis of sustainability and externalities at larger scales.	Hydro-economic modeling, partial equilibrium analysis (e.g., cost benefit analysis, economic surplus analysis), GIS /RS applications.	Economic, social and environmental sustainability, externalities.	Concrete AWM investment options.

Step 1: Situation analysis and initial screening

This step starts with creating an inventory of existing initiatives, ideas and projects: Who is doing what? What approaches work and where? What are the factors that influence success or failure? The idea is to cast the net wide and look not only at technologies, but also at policy and management innovations.

Next, the resulting long list of possible AWM solutions must be screened using five key criteria (outlined in Box 1) to identify those that deserve a closer look. An important element in this process is organizing a consultation meeting where stakeholders make a first selection of promising AWM solutions for their country, region or state. This participatory scoring and priority setting exercise not only facilitates rapid identification of the most appropriate AWM solutions, but also improves linkages among stakeholders and builds a spirit of collaboration.

Box 1. The five hurdles: Criteria for identifying promising AWM solutions

Possible AWM solutions are evaluated and compared according to five key criteria. These criteria can be thought of as hurdles that the possible solution must pass in order to qualify for the next step. The five criteria are:

- Contribution to smallholder livelihoods: increasing smallholder income, food security and household water availability, decreases drudgery, income fluctuation and risk.
- Gender and equity considerations: benefits women as well as men, does not place an undue burden on women or children, and does not increase income disparity in a community.
- Out-scalability: has the potential to benefit a relatively large number of people over a wide geographic area.
- Ease of implementation: has an implementation and dissemination pathway that is sustainable and cost-effective and an identifiable champion to carry it out.
- Resource sustainability: does not affect downstream users or cause harm to the environment. While smallholder AWM can be beneficial for an individual farmer, its uncontrolled spread can have unexpected consequences.

Step 2: In depth study to analyze opportunities and constraints

Step 2 analyzes the opportunities and constraints for the promising AWM solutions identified in Step 1, while looking for ways to enhance the former and ease the latter. PROCA focuses on seven clusters of constraints that must be addressed for a technology or a policy/management innovation to succeed (see Box 2). Some of these constraints will be internal to the community and can often be resolved locally; others will occur as a result of external forces and will require action at higher levels (for example, changes in national policy). This analysis will result in an even shorter list of possible solutions and provide a better understanding of the circumstances under which they can be successful.

Box 2. Key questions for evaluating opportunities and constraints for promising AWM solutions

- **Technology access:** How accessible is the innovation at the household level and to women, in particular?
- **Technology economics:** How affordable is the innovation to adopt and maintain? What are the costs (in terms of money and labor) and benefits (in terms of income and food and livelihood security), and how are these distributed among different members of the household and community?
- **Techno-institutional, social and policy dynamics:** What institutional structures are necessary to support uptake and optimal performance of the innovation? To what extent are these structures present, functioning and accessible to men and women?
- **Backward linkages:** How strong (or weak) are the input linkages necessary to adopt *and* benefit from the innovation?
- **Forward linkages:** How strong (or weak) are the market linkages (roads, communication, cold-chains, etc.) necessary to derive optimal benefits from the innovation?
- **Resource sustainability:** How reliable is the resource base in terms of its ability to sustain the innovation?
- **Managing externalities:** What are the possible social, health and environmental consequences from large-scale uptake/implementation, and how can these be eliminated or ameliorated?

Step 3: Analysis of out-scaling impacts

Although it is important to consider out-scaling impacts from the beginning of the process, a more in-depth impact assessment is required before promoting the spread of an innovation. Step 3 evaluates the likely positive and negative impacts and externalities of out-scaling the promising AWM solutions identified in Step 2 – looking at the potential to positively or negatively affect water resources, the wider economy and the environment.

What are the advantages of PROCA?

It's participatory – PROCA involves a variety of people at different stages and levels: farmers, policy makers, donors, researchers and key informants. Thus, it takes advantage of local knowledge and ensures that AWM solutions are tailored to the context and needs of end users.

It's rapid – PROCA relies on the participation of stakeholders to identify tentative AWM solutions and then screens and prioritizes the most promising solutions for a more in-depth analysis. This phased approach saves time and resources, and demonstrates results up front, which helps to keep stakeholders engaged.

It's multi-disciplinary – To provide a more complete picture, the conceptual and theoretical basis of PROCA draws from the fields of hydrology, water resources management, sociology/social-anthropology, economics, management science, and irrigation engineering.

It's scalable – PROCA can be used at a variety of scales – farm, community or watershed – and can be used to assess the potential for further out-scaling.

It's adaptable – PROCA gives the user the freedom to use a variety of tools and methods as long as they provide robust answers to the evaluation criteria defined in the protocol. By outlining a common but adaptable approach, PROCA facilitates comparison of AWM interventions across types, sectors and countries.



Project stakeholders

The project will be implemented to complement on-going initiatives and in collaboration with many national and international organizations, including:



Project partners



About IWMI

The International Water Management Institute (IWMI) is a non-profit, scientific research organization focusing on the sustainable use of water and land resources in developing countries. It is headquartered in Colombo, Sri Lanka, with regional offices across Asia and Africa. IWMI is a member of CGIAR, a global research partnership for a food secure future.

Our role

IWMI works in partnership with governments, civil society and the private sector to develop scalable agricultural water management solutions that have a real impact on poverty reduction, food security and ecosystem health. IWMI is a:

- think tank driving innovative research and ideas for solutions;
- provider of science-based products and tools; and
- facilitator of learning, strengthening capacity and achieving uptake of research findings.

We work directly with a broad spectrum of people and organizations, from rural farmers to national and Pan-African policymakers. This is because we recognize that, in order to really make a difference, our efforts are most effective when we partner with others. Careful consideration of how the outputs of IWMI's research activities can be easily communicated, understood, taken up and acted on forms a core component of our work. Our approach to impact puts people – research users and the ultimate beneficiaries – at the heart of research-for-development efforts.

IWMI Regional Office for Africa and West Africa Office

CSIR Campus, Martin Odei Block
Airport Res. Area, Accra, Ghana

Mailing address:

PMB CT112, Cantonments, Accra, Ghana

Tel: +233 (0) 302 784 753

Fax: +233 (0) 302 784 752

E-mail: iwmi-ghana@cgiar.org

<http://westafrica.iwmi.org>

<http://africa.iwmi.cgiar.org>

IWMI Headquarters and Regional Office for Asia

127 Sunil Mawatha, Pelawatte, Battaramulla
Sri Lanka

Mailing Address:

P.O. Box 2075, Colombo, Sri Lanka

Tel: +94 11 2880000, 2784080

Fax: +94 11 2786854

E-mail: iwmi@cgiar.org

www.iwmi.org

Head of West Africa Office: Olufunke Cofie (o.cofie@cgiar.org)

Director, Africa: T. Olalekan Williams (t.o.williams@cgiar.org)



RESEARCH
PROGRAM ON
Water, Land and
Ecosystems



Led by _____