

# Beating drought in the Sahel by supporting water-conserving farmer innovations

From dry to drier... climate change is exacerbating droughts in the Sahel and bringing with it ever-increasing challenges for small-scale farmers and livestock keepers, who make a substantial contribution to food and nutrition security in the region. Water is becoming an increasingly scarce resource, leading to conflicts among the various users. Many agricultural research and development (ARD) initiatives are grappling for ways to deal with this challenge, looking primarily at formal scientific research and high-tech solutions and often overlooking the role of small-scale farmers. These farmers, who understand their context and are holders of agroecological knowledge, innovate continuously in the face of challenge.

Prolinnova, a community of practice, engages in this overlooked area of local innovation. Prolinnova has been scouting for and documenting farmers' local

innovations developed as site-appropriate solutions to address their challenges, including the challenges that come with climate change. Prolinnova focuses on such local innovations as an entry point to a process of farmer-led joint research, also called participatory innovation development (PID), during which, farmer innovators work together with a range of local ARD stakeholders, to co-create solutions and knowledge that is beneficial and accessible to small-scale farming communities.

This article focuses on water management innovation cases from two countries in the Sahel – Burkina Faso and Senegal. They have both been supported through a Prolinnova project called Promoting local innovation in water management in family farming in the Sahel” (French acronym Proli-GEAFaSa). In each of these cases, the project teams work with farmer

innovators and a group of ARD partners who form a local multistakeholder (MSP) platform.

## Combining earthen mounds with zai pits to conserve water and soil for growing maize in Burkina Faso

This innovation was developed by Bassolé Adama, from Kilsio Village in the Commune of Reo, in response to poor harvests over two successive years. He realised that besides the impact of drought, his maize was also affected by poor soil fertility. He therefore initiated this integrated maize-production practice by combining zai pits and ridging techniques to conserve water for production and reduce the vulnerability of the maize crop. He first experimented with different systems. On some plots he grew maize on earthen mounds that were about 30 cm high, while on other



The project team undertaking a field visit to meet with the innovator, Bassolé Adama.

*Credit: Réseau MARP Burkina*

plots, he grew millet in zai pits. This increased yields per unit area, but when the area experienced dry spells during the rainy season, Bassolé found that the yields declined. Therefore, the focus of the farmer-led joint research was to address this challenge.

The farmer and his co-researchers wanted to explore the effectiveness of this water-management innovation, recognising that it had the potential to benefit the broader community, since maize is a staple food. The research team consisted of the farmer innovator who participated throughout the research process, members of the farming community who hosted trials in their fields, extension officers who supported in designing, implementing and monitoring the PID process, and a research associate from the agricultural research station, who supported the participating farmers with training in joint experimentation, guided planning of the trials and development of a joint experimentation protocol and tools for data collection, and participated in the monitoring and evaluation (M&E). The

ProligeaFaSa project team carried out monthly M&E and documentation visits, and provided guidance and other inputs to the PID process.

The experimental design allowed for a comparison of this local innovation (earthen bunds combined with zai) against the regular zai technique used by farmers. The outcome of the research was that the local innovation performed better than the regular zai technique in terms of germination rate, soil moisture, soil fertility, and grain and dry straw yields. The innovation offers communities an alternative way of growing maize that is more resilient to climatic risks.

The PID team disseminated the farmer innovation to diverse stakeholders by hosting an exchange visit for individual farmers, farmer organisations, local authorities, Sanguié Province's agroecological training centre and the Provincial Department of Agriculture, Animal Resources and Fisheries. The visitors confirmed the innovation's relevance to the local challenges and appreciated farmer creativity.

### **Reducing plants' water consumption using biodegradable cups in okra nurseries in Senegal**

The 60-year-old innovator, Mamadou Gueye in Kalassane Village in Rao District, is a farmer who also runs a small business as a secondary activity. During an exchange visit to a nearby village, he saw watermelon being grown in biodegradable cups. He decided to try the same technique with okra, first using plastic cups and then biodegradable ones.

He grows okra over a two-month period. With his old practice (direct seeding), he irrigated his okra seedlings with 10-litre watering cans and used 100 litres of water each day, and a total of 6,000 litres over the two-month period. His innovation involved planting two okra seeds in compost in each of the cups, and then watering them daily in the nursery until he transplanted them into the field after 25 days. For this 25-day period in the nursery, he used 500 litres of water. After transplanting the okra, which then grew for another 35 days in the field, he used 100 litres daily ie 3,500 litres in total. Thus,



**Modou Boye, a member of the multi-stakeholder platform, assisting with transplanting okra seedlings.**

*Credit: Abdoulaye Wattara, Agribio Services*

with his okra innovation, he was able to reduce water use by 2,000 litres for the same number of okra plants.

Market gardening and okra cultivation is a key economic activity especially for the women in the community. Mamadou’s innovation was viewed as a potential solution for other community members if tested and validated. MSP members and the NSC therefore selected this innovation for PID. The aim of this joint experiment was to analyse and document the effectiveness of this local innovation by comparing water consumption of the okra innovation with water consumption in directly seeded plots, so that the innovation, if validated, could be promoted more widely.

The main actors involved were the farmer experimenters, the MSPs, the project team and the National Steering Committee (NSC) of Prolinnova Senegal. The experimenters were three volunteers, including Mamadou, who were responsible for the experimental plots, maintenance, daily monitoring and collecting the data required for the comparison. MSP members, the project team and the experimenting farmers discussed and agreed on the research protocol and the costs for materials and inputs. The MSP members made periodic visits to monitor the plots and provide guidance to the experimenting

farmers. The project team from AgriBio Services, which coordinated the Prolinnova-GEAFaSa project, also made monthly visits to the experimenting farmers and the MSPs to review the progress of the joint experimentation, discuss any challenges and jointly find solutions. This participatory monitoring was crucial to compiling data and reviewing progress with a view to joint evaluation of the results of the experiments.

Each of the three volunteer experimenters, in three different localities in the zone, had an experimental plot and a direct seeded plot, and used okra seed that had a 60-day cycle. In the final evaluation of the results, the amount of water consumed in the okra nursery and transplanted plot was found to be 25% of the amount of water consumed in the control plot with direct seeding. This confirmed that transplanting okra led to reduced water consumption compared to direct seeding. Besides reducing the amount of water needed, the innovator was also able to reduce the labour required to irrigate the okra, which was seen by local people as a clear social benefit.

The project team organised exchange visits for farmer innovators from Wouro Madihou Village (Podor County) to the experimenting farmers to give them an opportunity to share their PID experiences. This enabled mutual learning on

the local innovation and PID process. The farmer experimenters also took part in a Farmer Innovation Fair organised in 2022 as part of the International Farmer Innovation Day celebrated each year on 29 November within the Prolinnova network. This was an opportunity to share knowledge with peers and with the project’s ARD partners and political-administrative authorities such as the Prefect, to expose them to the dynamics and benefits of farmer innovation in dealing with increasing climate-change induced droughts.

**Joining hands with farmer innovators to beat drought**

This article highlights the impacts of two simple farmer innovations in combatting increasing drought and providing simple and effective solutions for growing crops and ensuring food and nutrition security. Prolinnova’s PID approach is an innovative way to discover how farmers with promising innovative practices work with other actors to increase the relevance and effectiveness of their innovations in order to address challenges and opportunities faced in their respective contexts. Across the world, ARD policymakers and practitioners should be paying more attention to farmers’ own home-grown innovations to deal with the challenges of climate change and thereby co-create solutions that are impactful, affordable and beneficial to rural farming communities.

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Biodegradable cups with okra seedlings.

*Credit: Abdoulaye Wattara, Agribio Services*

# Getting farmer-led joint innovation processes mainstreamed: Lessons from Kenya and Ghana

## Introduction

When organisations are introduced to new approaches and they accept and apply them as part of their standard practices, this is called ‘institutionalisation’ of the new practices or approaches. Over more than two decades, ProInnova has ‘promoted local innovation’ and has actively worked to get different stakeholder groups to institutionalise participatory innovation development (PID) into their organisations. A series of webinars over 2024 and into 2025, have documented and shared experiences of institutionalisation efforts and achievements within the network. Those shared most recently come from Kenya and Ghana.

Two examples from Ghana of mainstreaming PID have included a non-governmental organisation (NGO) and a government actor. In Kenya, the role played by a local government officer in integrating PID into the activities of small-scale farmers also demonstrates mainstreaming.

## Experiences from Ghana

Ghana has had a country platform (CP) since 2004 and has implemented a number of funded projects, including the three project phases funded by German NGO Misereor, which have supported institutionalisation efforts. The Misereor-funded projects have all been coordinated by the Association of Church-based Development NGOs (ACDEP), which is the host organisation of ProInnova-Ghana. The CP has benefited from and built on ACDEP’s previous involvement with participatory technology development in the 1990s, and from the establishment of a multi-stakeholder working group in Northern Ghana, that focused on promoting low external input and sustainable agriculture (LEISA).

The latest phase of the Misereor-funded projects has been implemented at two learning sites – Walewale and Bongo – in different municipalities in Ghana. At the Walewale site, the two organisations that have been collaboratively implementing the project, and which have taken steps towards institutionalising PID, are the Center for Ecological Agriculture and Livelihoods



Local MSP members interact with and learn from the organic composting innovation group at the Walewale site.

*Credit: Ms Denisia Abulbire, ACDEP project officer*



Women innovation group in Walewale being trained on record keeping for their village savings social innovation by a local facilitator.

*Credit: Ms Scholastica Atara, local agriculture extension officer*

(CEAL) and the Department of Agriculture (DoA). Both organisations are members of a local multi-stakeholder platform (MSP) that has been active in selecting local innovations for PID and then supporting the implementation and monitoring of the PID processes. The MSP has supported CEAL to organise exchange visits, farmers days and policy dialogue sessions, while a technical support team representing a range of organisations has supported the PID processes as well as related activities such as product packaging and gender integration.

A number of activities have contributed to the institutionalisation of the PID approach within CEAL and DoA, including the sharing of PID processes and outcomes at various events, and the sharing of roles within the PID process. Changes have taken place within the organisations that provide evidence of institutionalisation. For example, within CEAL there are 14 staff that are using PID within their project activities and sharing outcomes with stakeholders for scaling up, and the organisation has also become an advocate for PID and has made presentations at a range of events.

Within DoA, changes have also been seen. For example, they have incorporated PID into their regular farmer training programmes, they generate their workplans in partnership with farmers and are also becoming advocates for PID for agroecology. One very concrete example is that the DoA Livestock Unit started working with officials from the Ministry of Food and Agriculture to upscale a supplementary feeding practice of a woman innovator who was identified through the Misereor-funded project.

There is also enhanced collaboration between CEAL and DoA such that they have joint projects (mainly related to dealing with flood disasters and enhancing food security) and share resources, making them more effective in reaching out to farmers.

Some lessons that have emerged in Ghana about institutionalisation relate to (1) the nature of the organisation – with small organisations being easier to influence; (2) alignment with organisations’ own objectives and ongoing



**Amos Okore, An Assistant chief, being awarded a certificate for participating in a Farmer Innovation Day in Kisumu.**

*Credit: Vincent Mariadho (World Neighbors)*

projects; and (3) the presence of ‘champions’ within organisations who hold leadership positions and are convinced about the effectiveness of the approach.

**Experiences from Kenya**

The Kenya country platform, which was established in 2007, involves about 40 diverse organisations including NGOs, universities, research institutions and a number of other networks. There are local MSPs that are made up of local organisations and farmer innovators. As with Ghana, Prolinnova Kenya (PK) has benefited from a number of projects since 2008, including but not limited to those funded by Misereor that have focused on institutionalising local innovation and PID for food and nutrition security.

One of the organisations that has been seen to mainstream PID is the Local Administration, which is one of the key stakeholders, responsible for mobilising and organising communities for development activities. One of the Assistant Chiefs, who is also a farmer innovator, has been participating in the local MSP at the Kisumu action learning site. Through his involvement in PID activities, the Assistant Chief has impacted positively on his community

by supporting the establishment of a centre where farmers can apply for documentation of their innovations; by sharing PID and Prolinnova activities at the Chief’s baraza (ie meeting place); and by making the Chief’s facilities available for innovation fairs. Besides the Assistant Chief’s own innovative behaviour, he has also encouraged other farmers to continue innovating to deal with their food production challenges.

The lesson from this is that there is value in integrating local leadership into local MSPs as a way of creating an enabling environment for innovators, and this is even more effective if the leaders are themselves farmer innovators.

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