Innovator Benigna Muumbua explaining her organic fruit-fly trap to members of the Makueni Local Steering Committee set up through the Proli-FaNS project (photo: Chesha Wettasinha)

April 2020

Policy Brief

Supporting local innovation for household food and nutrition security

Highlights

- Improved and diversified agricultural production by rural households generally leads to improved household nutrition.
- Local innovation takes place along the chain from production to processing and marketing of food and other agricultural products.
- Local innovations that improve agricultural production and food processing and generate income, especially those developed by women, should be supported by ARD service providers.
- Farmer-led innovation processes should be encouraged by staff from non-governmental organisations and government officials supporting agricultural and rural development as a pathway to food and nutrition security.
- The pivotal role of women innovators in improving the food and nutrition security of their families and communities should be recognised and promoted by programmes that address malnutrition.
- Joint experimentation led by farmer innovators can develop locally appropriate technologies or institutional arrangements that strengthen agricultural production and food processing and, in turn, household food and nutrition security.

Local innovation, especially by women, provides solutions to challenges faced by rural households and can improve food and nutrition security.

Household food and nutrition security

To be food secure, households need access to safe and healthy food – in sufficient quality – throughout the year. "In 2017, the number of undernourished people is estimated to have reached 821 million – around one person out of every nine in the world. Undernourishment and severe food insecurity appear to be increasing in almost all subregions of Africa, as well as in South America. The alarming signs of increasing food insecurity and high levels of different forms of malnutrition are a clear warning that there is considerable work to be done to make sure we leave no one behind on the road towards achieving the SDG goals on food security and improved nutrition" (FAO *et al.* 2018).

Improving agricultural production can thus directly (by providing access to food) and indirectly (through farm income) improve food and nutrition security (FaNS) and local innovation is an effective way of achieving this. In addition to improving farm production, efforts to fortify foodstuffs can also have a substantial effect on FaNS.

PROLINNOVA and its principles

PROLINNOVA is an NGO-initiated international multi-stakeholder network that promotes local innovation processes in ecologically oriented agriculture and natural resource management. For many years, the members of the PROLINNOVA network have been promoting farmer-led innovation and participatory research and development. The entry point for this approach are local innovations – new and better ways of doing things – developed by small-scale farmers to find solutions to their challenges and problems, to seize new opportunities and thus to improve their local farming and land-use systems and their livelihoods. Local innovation processes can be intensified and accelerated when diverse actors in agricultural research and development (ARD) holding different types of knowledge come together in the spirit of sharing and learning based on mutual respect, regardless of their level of academic education.

The PROLINNOVA network refers to the art of coordinating and facilitating joint learning and co-creation of knowledge as "participatory innovation development" (PID). The ultimate aim is to enhance the local capacity to innovate – and thus to adapt to new challenges and opportunities. It is an alternative to the "transfer-of-technology" approach, where new technologies developed by scientists and other external experts are then passed on through various intermediaries to farmers who are expected to adopt the introduced technologies and practices. An alternative was developed because uptake of these technologies has often been poor, as many are not appropriate for the contexts in which farmers operate. The PID approach consists of stimulating ARD actors, including small-scale farmers themselves, to

PROLINNOVA
PROmoting Local INNOVAtion
in ecologically-oriented agriculture and natural resource management

PROLINNOVA vision:

A world where women and men farmers play decisive roles in ARD for sustainable livelihoods

recognise local innovation processes and the outcomes of these processes and to encourage actors in agricultural research, extension and education to support farmers' initiatives in ways that strengthen local capacity to innovate and adapt.

The Proli-FaNS project

The content of this policy brief draws on the findings of the "**Pro**moting **l**ocal **i**nnovation for **F**ood **a**nd **N**utrition **S**ecurity" (Proli-FaNS) project, which ran from 1 August 2016 to 31 July 2019 in five African countries in the international PROLINNOVA network – Burkina Faso, Cameroon, Ethiopia, Ghana and Kenya. The project sought to develop the innovative capacities of rural communities, especially women, to effectively improve food security, nutrition security and nutritional diversity. The partners in the countries where the project was implemented facilitated participatory research to improve innovations related to food and nutrition security that had been identified and prioritised together with both men and women farmers, including women's groups and mixed-gender groups. The second phase of the project has now been initiated and is titled "Scaling Up Local Capacity to Innovate for Food and Nutrition Security" (SULCI-FaNS).

Innovations that ensure food and nutrition security

Innovations in the domains of local nutritious foods, food processing, crop improvement, crop storage, animal health and husbandry, soil fertility and water management, environmental conservation, socio-institutional organisation and income generation through value addition have the potential to improve household production and, in turn, food and nutrition security and nutritional diversity. These include farmers' experimentation and innovation in producing and preserving agricultural products, developing organic fertilisers and biopesticides to be able to produce and consume good-quality and safe vegetables, and local food processing to enhance the nutritional quality of local dishes. Some of the interesting cases identified are presented in the Boxes 1-5.

Impacts on household and community FaNS

During focus group discussions (FGDs) for evaluation of the project, women in the communities in Cameroon said that the Proli-FaNS project had added diversity to the daily diet and made it possible for households to provide for nutritious and affordable snacks for children at school. In Ethiopia the participants of the FGDs said that farmers are growing a wider range of crops and fruit since being involved in the project, while others are practising innovations that control pests that affect production and storage. In Kenya some participants of the FGDs said that their innovations are allowing them to meet the dietary needs of their families, while others indicated that they have diversified farm production and are selling the surplus produce. One woman highlighted that her innovation was saving her time that she invested in producing more food. Some innovators said that they are now able to preserve food during times of surplus so that they have year-round supply, while others had developed technologies that allowed for year-round production. A number of the participants acknowledged local innovators from whom they had learned new practices leading to improved food supply.

The work in Kenya was said to have assured people of a year-round supply of vegetables for themselves and their neighbours. Thus, they no longer needed to pool resources to send one person to the nearby town to buy vegetables during periods of scarcity (known locally as *luowo*). In terms of impacts on women, one respondent said that local innovation has allowed women to provide family meals without relying solely on men. With diversified crop production accompanied by food processing and preservation skills, diverse food types have been incorporated into family diets. The innovators and adopters who participated in the FGDs in Ghana also said that the spread and adoption of preservation and storage techniques as well as the increased sales and income from improved agricultural produce and other products such as shea butter have contributed to improved nutrition in their households such that they can now eat three meals a day.

Box 1: Innovation to prevent crop losses in Ethiopia

In the Axum area of northern Ethiopia, the small-scale farmer Gebreyesus Tesfaye developed a biopesticide that can control fall armyworm (FAW). He had started developing a biopesticide already in 2015 to control insects in his crops, using leaves of about 45 different plants plus goat urine and salt. He selected and mixed plant varieties with leaves that have a bitter taste to make a biopesticide in fluid form. In Tigrigna, it is called *tsere balie*, which literally means biopesticide. The innovation was identified under the Proli-FaNS project in 2016 and promoted through farmer field schools (FFSs) and farmer innovation fairs (FIFs).

Gebreyesus Tesfaye presenting his biopesticide at a farmer innovation fair in Axum (photo: Hailu Debalke)

When the new pest, FAW, appeared in his area in the 2016/17 cropping season, Gebreyesus tried his homemade biopesticide and found that it killed the FAW. The treated plants – mainly maize and teff – remained healthy and were therefore stronger and more resilient to drought. The innovator and other farmers in his community say that they can now produce more grain and have attained greater food and nutrition security for their families. This innovation has benefited not only his community but also people who live in other communities in the Axum area who have learned about the biopesticide from Gebreyesus during an FIF organised by PROLINNOVA – Ethiopia.

Beza Kifle, Proli-FaNS Coordinator in Ethiopia and Yohannes Gebremichael, interim PROLINNOVA*–Ethiopia coordinator*

Box 2: Innovation to improve local diets in Ghana

In Ghana, when speaking about the contribution of local innovation to her food and nutrition security situation, Ms Sana Baba, a local bean-cake (*kooshie*) seller in Zang Community in Yendi Municipality, said: "After the joint experimentation process on innovative methods to improve the nutritional content of my *kooshie* and fortify my other home dishes by incorporating soybeans and moringa leaves, my daughter's chronic anaemia, which often got us to hospital for blood transfusion, has ceased. Also, my income has doubled, as more people are now buying my *kooshie* because it is more nutritious and tastier than before." Also Ms Asoo Awine, a subsistence female farmer in Yidongo-Tamolga Community in Bongo District said that much of her sweet potato used to go waste after harvesting, but she has found heaven after jointly experimenting, together with the female agricultural extension and nutrition officer, to process the perishable produce into value-added nutritious recipes and products such as cakes, flour and drinks. She now adds the sweet-potato flour to prepare many of the family's staple foods, making them more nutritious and palatable. She has also started preparing and selling drinks made of sweet potato daily in the local school and community centre. She earns good extra income from these drinks, which makes her better able to care for her two children, who are now attending school more regularly.

Naomi Zaato, the PID facilitator (2nd from left) and Sana Baba (3rd from left) and her group members display their *kooshie* recipes (photo: Gabriel Adabra)

Naomi Zaato, Agricultural extension officer, Yendi; Dominic Avea, NGO field manager, Bongo

Box 3: Innovation for household vegetable production in Kenya

In Kenya, Ms Rebecca Dero was growing various leafy vegetables and tomatoes in a sack garden, a technology promoted by Kisumu County Department of Agriculture, Livestock and Fisheries under the Community Feeding Programme to increase family food and nutrition security. The sack garden has a middle column made of stones and pebbles into which water is poured, but Rebecca discovered that the water trickles down quickly to the bottom, leaving the upper parts of the sack dry. She had to use lots of water – a scarce resource in her area – to keep all the soil moist. She decided to improve the system so that it uses less water yet ensures that all parts of the sack receive enough water. She inserted a perforated polythene tube connected to a 20-litre water container, which serves as the reservoir. The perforation makes it possible to provide drip irrigation to each plant in the sack garden. Her innovation has enabled her not only to improve her yields but also to produce vegetables and tomatoes year-round without relying on rainfall. With abundant produce, she has been able to improve and diversify her family's diet and to sell the surplus for income. Rebecca has trained other community members on her innovation, and was recognised and awarded certificates by the County Governments of Kisumu and Makueni at the 2018 annual International Farmer Innovation Day and at the FIF in 2019, respectively, for her outstanding innovation in food security and climate-change adaptation.

Ms Rebecca Dero showing her improved sack-garden technology (photo: Chesha Wettasinha)

Vincent Mariadho, Prolinnova *– Kenya coordinator*

Box 4: Improved food security from snail production in Cameroon

According to Ms Catherine Ngah, an innovator in Cameroon who farms snails, her joint experimentation with Obala Agricultural College has helped her to construct a more secure and comfortable pen close to her house for raising snails, and to introduce papaya leaves to diversify the feed for snails. Snail farming has contributed directly to improving the food security of her family, and income from selling snails provides cash for buying foodstuffs such as rice and fish that she and her husband do not produce. Rearing snails close to her house has provided her family and her customers improved access to animal protein as compared to collecting snails in the forest, where the increasing human population pressure and destruction of the snails' habitat is reducing their numbers.

Ms Catherine Ngah with her snail pen (photo: Jean Bosco Etoa)

Jean Bosco Etoa, Prolinnova *– Cameroon coordinator*

Box 5: Fortification of local porridges to overcome child malnutrition in Burkina Faso

Mrs Salimate Tiebli is an innovator who has been exploring options for producing enriched porridge that can overcome the problem of malnutrition in children in the Zondoma province in Burkina Faso. She formed a group called 'Association Pagb-yidgr-sulli' to better share her experiences. The products, which are called *Mamans lumières* (Mothers' lights), are pre-cooked porridges made from local cereals such as millet and fortified with moringa (*Moringa oliefera*) and baobab (*Adansonia digitata*). Through a process of joint experimentation supported by the Proli-FaNS project, which included the community group, health services and researchers, the formulation of the flours was investigated as well as their nutritional content, which showed that the fortification led to the flours complying with national standards for protein, lipid and zinc contents.

Innovator Mrs Salimate Tiebli demonstrating her product to other women in the village (photo: Siaka Bangali)

Siaka Bangali, Proli-FaNS project coordinator, Burkina Faso

Gender & innovation in food and nutrition security

The social status and confidence of rural women as key partners in the development process and major contributors to family food security and incomes were enhanced in the Proli-FaNS project by deliberately targeting and prioritising their innovations, as well as by promoting and featuring outstanding women innovators and their innovations to ARD stakeholders and the public.

Supporting women to share their innovations on public occasions also earned them more respect from men and traditional leaders in their own communities and to local agricultural research and advisory services and educational institutions. It revealed their potentials and capabilities to innovate in farming, food processing and agro-enterprises and encouraged more women to come "out of their shells" to innovate and experiment in order to find ways to improve their families' nutrition and health and to generate additional income under the women's own control (Waters-Bayer *et al*. 2020).

Through local innovation and PID processes, women innovators or innovation groups have established stronger relationships with agricultural extensionists and researchers which have enhanced mutual learning and women's innovation capacities for improving food and nutrition security.

Implications for policy and practice

- Government agencies that support agriculture and human health should actively seek to identify relevant cases of local innovation, especially of women, that can be supported or shared with other households in order to improve their food security and nutrition security.
- Extension and research agents involved in home economics, health and agriculture should seek to form partnerships with community members that are already experimenting with new practices and products to develop them further by combining different sources of knowledge.
- In the field of household food and nutrition security, the role of women should be recognised as they are generally responsible for feeding their families and many are already looking for affordable, effective ways of making sure that their families have access to enough safe, healthy food.

References

FAO, IFAD, UNICEF, WFP and WHO. 2018. *The State of Food Security and Nutrition in the World 2018. Building climate resilience for food security and nutrition*. Rome, FAO. http://www.fao.org/3/i9553en/i9553en.pdf

Waters-Bayer A, Letty B & Wettasinha C. 2020. Farmer-scientist interaction in farmer-led joint research. In: Waters-Bayer A, Letty B, Wettasinha C, Djohy G & Nchor J (eds), *Collaboration between farmer innovators and formal scientists in Participatory Innovation Development (PID)*. Preliminary publication, Prolinnova.

This brief by Brigid Letty, Joseph Nchor and Chesha Wettasinha draws from the project "Promoting local innovation for Food and Nutrition Security" (Proli-FaNS) funded by Misereor/Katholische Zentralstelle e.V. (Catholic Central Agency for Development Aid – KZE, Germany) through a grant from the "One World No Hunger" (SEWOH) initiative of the German Federal Ministry for Economic Cooperation and Development (BMZ). More information about the project can be found under www.prolinnova.net/fns and a summary of the innovations encountered can be found at http://www.prolinnova.net/content/local-innovations-identified-food-nutrition-security

PROLINNOVA
PROmoting Local INNOVAtion
in ecologically-oriented agriculture and natural resource management

PROmoting Local INNOVAtion in ecologically oriented agriculture and natural resource management is a community of practice involving partners in 21 countries in Africa, Asia and Latin America. Initiated by CSOs as a Global Partnership Programme under the umbrella of the Global Forum on Agricultural Research (GFAR), it embraces both state and non-state organisations. It promotes recognition of local innovation by women and men farmers as an entry point to farmer-led participatory research and development. The ultimate aim is to integrate this approach into institutions of agricultural research, advisory services and education. Over the years, funding has come mainly from the Netherlands and French Governments, Rockefeller Foundation, GFAR, Misereor and partners' own contributions.

PROLINNOVA Northern Focal Point c/o Agrecol Association for AgriCulture & Ecology, Germany
E: info@agrecol.de W: www.prolinnova.net