

UNDERSTANDING “CAPACITY TO INNOVATE AND ADAPT” FROM A SMALLHOLDER PERSPECTIVE

**Report of a study based on interviews with 12 farmer innovators at the West
African Farmer Innovators Fair, Ouagadougou, Burkina Faso, May 2015**

DRAFT

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June 2015

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INTRODUCTION

In seeking to increase the impact of agricultural research on rural development, the international agricultural research institutions under the CGIAR are paying more attention to their role in stimulating, supporting and strengthening the capacities of rural communities to innovate in response to new opportunities and to adapt in the face of changes and challenges. Thus, two of the Intermediate Development Outcomes (IDOs) of the CGIAR Research Programmes are:

- Increased capacity for innovation within low-income and vulnerable rural communities allowing them to seize new opportunities to improve livelihoods and increased incomes;
- Increased capacity in low-income communities to adapt to environmental and economic variability, shocks and longer-term changes.

A central issue is how to monitor and assess whether and how these capacities are indeed strengthened. How can one “measure” the capacity to innovate or the capacity to adapt, the rate of growth in community-based innovation in response to new opportunities and the change in degree of resilience at family and community level in the face of rapid change?

Answering these questions involves first of all identifying and describing in a coherent way the key factors that determine local innovative and adaptive capacities, before seeking ways to monitor each of these factors in a meaningful and efficient way. Currently, the issue of monitoring and measuring these IDOs is being debated in the CGIAR system, together with some partners in universities and civil-society organisations (CSOs). They have identified five core capacities at the level of individual stakeholders, including farmers and farmer innovators and their communities, and three at the level of facilitators of system innovation that together would form a system’s capacity to innovate (Leeuwis *et al* 2014)¹. This is a clear call to look at community-level innovative capacities as part of a wider system capacity to innovate.

In the discussions thus far about these IDOs, little space has been provided for innovative farmers, communities and the field-based actors working closely with them to bring in their experiences and insights. Yet it is at this level that local innovation occurs and where many local “experts” live and work who would be able to define what local innovative capacity entails in practice.

Since 2004, PROLINNOVA, an international network promoting farmer innovation, has been bringing together researchers, development practitioners and farming communities – including many local innovators – to develop, improve, promote and institutionalise participatory approaches to innovation development at farm and community level. The very

¹ Leeuwis C, Schut M, Waters-Bayer A, Mur R, Atta-Krah K and Douthwaite B. 2014. Capacity to innovate from a system CGIAR research program perspective. Penang, Malaysia: CGIAR Research Program on Aquatic Agricultural Systems. Program Brief: AAS-2014-29.

heart of the Participatory Innovation Development (PID) approach is the longer-term strengthening of local capacities to experiment, innovate and thus grasp new opportunities and adapt to change. Over the years, a growing network of experienced farmer innovators and innovator groups has emerged around PROLINNOVA and related initiatives and projects. Purposeful and systematic interaction with these innovators could generate valuable insights into how they view local innovation and the factors that help or hinder the capacity to innovate.

The West African Farmer Innovation Fair held in Ouagadougou, Burkina Faso, in May 2015 presented a unique opportunity to discuss these issues in depth with a total of nearly 50 farmer innovators from eight countries (Benin, Burkina Faso, Cameroon, Ghana, Mali, Niger, Senegal and Togo) who converged for this event. In each country, a multistakeholder National Committee was responsible for selection of and support to a group of 6–8 farmer innovators who participated in the fair. This initial selection was screened by a Regional Committee based in Ouagadougou before final approval. More information on the fair can be found at www.fipao.net

This report presents the results of a brief study that is based on the individual responses of selected farmer innovators who were interviewed during the fair.

STUDY OBJECTIVE

The study had the following objective:

To define and describe the elements and factors that determine the local capacity to innovate and adapt from the perspective of smallholder farmer innovators.

METHODOLOGY

The main tool used for eliciting the views of the farmer innovators on aspects related to local (farmer) innovation (LI) and the capacity to innovate were focused interviews, each of 1–2 hours' duration. The interviews were conducted by Jean-Marie Diop, a French-Senegalese agronomist with longstanding experience in supporting farmer innovation and farmer- and community-led research and development in Africa. He is closely associated with the PROLINNOVA network and has been supporting the Country Platforms in West Africa for many years. He had the added advantage of being able to conduct some of the interviews in the local language spoken by the farmer innovators. In other cases, he used the services of the translators from the different National Committees who were at the fair.

Jean-Marie Diop worked closely with staff of the PROLINNOVA International Secretariat in preparing, conducting and documenting the interviews.

Selection of farmer innovators: Using the short descriptions of all the farmer innovators approved by the Regional Committee to attend the fair, 12 innovators were selected for the interviews. The main consideration in this selection was to obtain as diverse a sample as possible in terms of the country of origin, gender, age and type of innovation. This initial selection was shared with the National Committees in each of the participating countries for their review. The selection was approved in all cases except Ghana, where the National Committee proposed a different innovator for the interview. Thus, a total of 12 farmer innovators, five women and seven men, were selected. Some basic information on these innovators is provided in Table 1.

Table 1: Farmer innovators interviewed during the West African Farmer Innovation Fair

Name	Country	Age (years)	Sex	Innovation
Yombo Naomi	Benin	28	F	Using compost in <i>zai</i> pits and on broadcast plots (production technique)
Asseta Ouedraogo	Burkina Faso	38	F	Biopesticide for vegetable plants (plant treatment product)
Lassane Savadogo	Burkina Faso	62	M	' <i>Manegre</i> ' or cellar or storage silo (technologies for preserving potato, onion and yam)
Samaki	Cameroon	41	M	Awareness-raising and facilitation: creating a producers' association (institutional innovation)
Joseph Abarike	Ghana	54	M	Fish feed (production technique)
Aminata Dembele	Mali	52	F	Biopesticide (plant treatment product)
Nouhoun Traore	Mali	38	M	Incubator made of ' <i>banco</i> ' (mud mixed with straw) (poultry production technology)
Aminta Hassini	Niger	28	F	Community radio (communication technique)
Hamadou Oumarou	Niger	50	M	Clearing aquatic weeds from ponds (natural resource management technique)
Djibo Mounkeila	Niger	40	M	Systems of rice cultivation outside the landscape areas (production systems)
Serigne Dieye	Senegal	-	M	Promoting and transforming family farms (institutional innovation)
Touti	Senegal	-	F	Processing cashew nuts (production technique)

The interviews: Given the topic and the explorative nature of the study, semi-structured interviews were organised with the 12 innovators. A simple interview checklist was developed in French (English translation in Annex 1) to guide the interviews and to ensure consistency in terms of the information to be gathered. Each interview had two distinct parts:

- Open narration by the innovator about the specific innovation – what it is, how it works, what it does and what results it provides – as well as the process of developing the innovation over the years (why, what, how, when questions).
- Deeper probing on the farmer’s view on his/her capacity to innovate (without using this term or concept) and to find out what has helped and/or hindered him/her in the process and what s/he thinks could support/stimulate the process of innovation.

All interviews were recorded and the recordings were used for preparing notes of the interviews in French. A few of the farmer innovators interviewed had access to Internet and, in their cases, some additional information was obtained later through e-mail.

Processing and analysis: All responses and comments made by the 12 farmers during the interview pertinent to the main parts of the checklist were collected and compiled per farmer and recorded in a table (English translation in Annex 2). Looking at the table, it is clear that certain issues/points are raised more frequently than others. The responses of the farmer innovators in relation to five key aspects (see under Findings below) were categorised according to the frequency each issue had been mentioned. This led to a list of main issues – considering those raised most frequently to be the most important. Some important views of farmers in relation to the capacity to innovate, their concerns in and suggestions for enhancing the process of local innovation were drawn from this analysis.

Limitations: The choice of the fair venue did not cater for a separate space for conducting the interviews. As such, the interviews had to be done in the main hall while the farmer innovation fair was in full swing. The hustle and bustle of people moving around and talking disturbed the interviews at times and may have influenced the concentration of the farmers and the way they responded to the questions. The length of the interviews was thus adapted when needed. Working with certain translators posed additional challenges due to their limited understanding of French. Nevertheless, the interviews managed to bring forward some of the factors that farmer innovators regard as important in influencing their capacity to innovate.

FINDINGS

The responses of the farmers, compiled in Table 2, provide insights into their views on five key aspects related to the capacity to innovate. These five aspects, drawn from relevant parts of the interview checklist (Annex 1), are as follows:

1. What are characteristics of an effective innovator?
2. What supports and facilitates local innovation processes?
3. What limits or constraints local innovation?
4. Farmers’ recommendations to strengthen local innovation processes
5. Farmers’ recommendations to address constraints to local innovation.

The responses of the farmers on each of these five aspects were analysed in order to draw out key findings.

Characteristics of an effective innovator

Farmers' views on what characterises effective innovators are found in Column 5 of Annex 2. Some farmers mention several elements, whereas others focus on only one or two. They refer to characteristics such as personality traits of innovators, their interest and skills in "research", willingness to share and ability to communicate and collaborate with others. Table 2 presents an analysis of all responses on this topic, indicating how many times a particular characteristic was mentioned in the interviews.

Table 2: Analysis of farmers' views on key characteristics of effective innovators

Key characteristics	Times mentioned
<i>Personality traits</i>	12
Pro-active, self-confident, persevering	6
Desire for continued development in his/her work	1
Dares to take risk, not afraid of critics	4
Follows intuition	1
<i>Interest and skills in "research"</i>	9
Observation, analysis of problems and options, comparing, weighing alternatives, experimentation, able to link past practice with current conditions	9
<i>Interest in and capacity to communicate and share</i>	7
Communicating with and convincing others	5
Looking for/accessing new ideas, language capacity to access information	2
<i>Openness and capacity for (facilitating) collaboration</i>	4
Open to others, collaborating with others to experiment, bringing people together, dialogue within family	4

Apart from the frequent reference to relevant personal characteristics, it is interesting to note the importance given to what one could call typical research capacities in terms of analytical skills and the systematic comparison of alternatives, if needed, through experimentation. The innovators also emphasise the importance of communication skills, first of all for sharing with others but also as relevant for seeking and accessing new ideas from various sources.

Factors supporting and facilitating local innovation processes

Table 3 presents a synthesis of farmers' responses on the factors that support and facilitate local innovation from their perspective. Here again, the responses on this question are categorised according to the importance that the farmers attach to each factor, indicated by the frequency it is mentioned.

Table 3: Synthesis of farmers' views on key factors supporting local innovation

Key factors	Times mentioned
<i>Individual</i>	8
Own interest, insight, open spirit	7
Own funds generated from innovation	1
<i>Family</i>	5
Assistance, encouragement from family members	5
<i>Community</i>	9
Integration in farmers' group, experimentation in a group	2
Encouragement from neighbours, villagers asking advice	3
Spread of innovation by cooperative, other villagers	2
Support, encouragement, technical advice by farmer cooperative or group members	2
<i>External agencies</i>	20
Training support, visit by technical staff, advice in organising and managing the group	8
Recognition by government agency	1
Provision of equipment	4
Funding	5
Participation in innovator fairs, support to increase visibility	2
<i>Policies</i>	1
Agriculture and park management policies	1

The responses of the farmer innovators shows the importance they attach to the support received from people in their immediate social networks such as family members, neighbours, cooperative members etc. However, their responses show that they greatly value the support from external agencies, with training, advice and funding as important aspects of such support. Supportive policies, on the other hand, are hardly mentioned.

Factors limiting or constraining local innovation

During the interviews, it became clear that the farmer innovators faced many constraints in developing their innovations. Their responses were analysed and clustered into six main factors as in Table 4.

Table 4: Synthesis of farmers' views on key factors constraining local innovation

Key factors	Times mentioned
<i>Resource-related constraints</i>	9
Access to land, access to other materials required (availability, distance, costs)	5
Lack of labour	2
Others: protection of plots from animals (fences), rainfall	2
<i>Funding</i>	6
Lack of funds, short-term funding only, high bank interest rates	6

Role & attitude of external agencies	7
Lack of recognition by researchers, their attitude of superiority, danger of researchers/other experts hijacking the farmers' innovations	4
Lack of research support to improve innovation, research support expensive and risky	2
Lack of pathways to disseminate innovations	1
Opposing commercial interests	4
Local officials whose vested interests are threatened, opposition from entrepreneurs who control the market, scarce materials controlled by entrepreneurs/middlemen	4
Lack of knowledge, skills	4
Poor mastery of equipment needed for experiments, inability because of illiteracy to monitor and evaluate innovation well, lack of training in various aspects that could improve the process of innovation	4
Community	3
Sabotage by community members, reluctance, group members not following	3

The main constraints to local innovation mentioned by the farmer innovators are related to resources (land, labour, rainfall, materials etc), funding and the attitudes of certain external support providers such as researchers. Lack of knowledge and skills such as literacy and the use of equipment are also considered drawbacks. The innovators also mention opposition from parties within the community who feel that local innovation is a threat to their interests and established ways of doing things.

Farmers' recommendations to strengthen local innovation processes

Having discussed the factors that support and hinder local innovation, the interviewees were asked for their views on how to promote and strengthen the process of local innovation. Here again, there was a diversity of responses, which could be grouped into five key recommendations as shown in Table 5.

Table 5: Synthesis of farmers' recommendations for strengthening local innovation

Key recommendation	Times mentioned
Promotion of relevance of LI	10
<i>General:</i> change in mentality of local authorities and leaders to accept LI, general promotion of LI, LI as relevant as formal research, lobby for LI with donors, give recognition and space to farmer innovators	7
<i>Specific:</i> encourage women to innovate, improve documentation of LI, involve innovators in schools and in teaching	3
Funding	1
Create funding support for innovators	1
Change role of external agencies	6
Research knowledge should support farmers in the field, all actors to collaborate with innovators in participatory research	2

Transparent project design, improved project monitoring and evaluation, correct reporting, prevent power politics to interfere with development, post-project assessments built in to measure impacts	4
Access to and sharing of knowledge	8
Training	2
Farmer innovation fairs, exchange visits, space for innovators to explain their work, networking between innovators	6
Other	2
Reflection is needed on how to support local innovation and innovators	1
Promote spread and use of specific innovation	1

Many of the farmer innovators give high priority to getting wider recognition for the relevance of local innovation among development stakeholders. They also stress the need for changed roles of external support agencies to be truly collaborative and supportive of farmer innovation processes. They call for changes in project design, monitoring and evaluation, reporting and impact assessment to make space for “real” participatory research. Creating opportunities for learning, sharing and networking such as innovation fairs, exchange visits and training sessions are also mentioned as important to enhance local innovation.

Farmers’ recommendations to address constraints to local innovation

As part of the interview, the farmer innovators were asked to provide their views on how some of the constraints to local innovation they mentioned (see Table 4) could be overcome. Several key recommendations were drawn from their responses, as shown in Table 6.

Table 6: Synthesis of farmers’ recommendations to address constraints to local innovation

Key recommendation	Times mentioned
Initiatives to address resource-related constraints	6
Use of local transport (not depend on external sources), find ways to get access to land, ensure availability of material (e.g. planting material) to continue innovation	6
Promotion of relevance of LI	3
Local awareness raising on relevance of LI, argue complementarity between LI and science-based innovation	3
Level and form of funding	4
Government payments to farmer innovators (as given to government extension staff), rewarding innovators when their innovations are widely spread, creation of funding window to support LI	3
Funding support preferably with relatively small amounts but for longer periods of time	1
Change role of external agencies	9
Value addition by researchers to LI, validation of LI for easier spreading by agencies, research results better linked to farmer innovators, more participatory research	4

More interaction with innovators to address challenges, do not leave innovators to work in isolation, include FI in all development strategies	2
Training and coaching in financial management, training linked to LI to add value	2
Training for researchers and extensionists to open them up for LI and change their attitude	1
Community	1
Promote collective action at community level	1
Legal and policy frameworks	2
Ensuring intellectual property rights for farmer innovations, legal changes to allow community radio to operate and be funded by the government	2
Learning/training opportunities	2
Learning centres for young farmers interacting with innovators, literacy training	2

In addressing constraints to local innovation, two recommendations stand out. The first is related to removing barriers to access resources (land, labour, transport etc) needed by the farmer innovators to be able to carry out their work. The second is related to the role of external agencies. The responses point to various ways in which external agents such as researchers could support the process of local innovation, such as joint research, value addition, and training and coaching in relevant subjects. The interviewees also mention training that would bring about attitudinal changes among external agents to better support LI processes. Several farmer innovators mention the need for funding of local innovation, particularly for forms of funding that is tailored to their specific situation².

² None of the farmer innovators interviewed had experience with the local innovation support fund (LISF) piloted by ProInnova in other countries. More information on LISFs at <http://www.prolinnova.net/lisf>. See http://www.prolinnova.net/sites/default/files/documents/LISF/policybrief_prolinnova_july2012_a4_lr.pdf

CONCLUSION: FARMER INNOVATORS' PERSPECTIVES ON CAPACITY TO INNOVATE

The findings of this study should be framed within the specific context in which it was conducted. Most of the responses in these interviews, for instance, have been made in relation to the innovators' own, specific innovations and not to farmer innovation in general. This could be explained by the fact that each of the farmer innovators interviewed had been invited to this regional fair to showcase his or her specific innovation, which was the centre of their focus. Moreover, these innovators were being interviewed in entirely new surroundings, and for most in a different country far from their homes and farms, which could have had a bearing on how they responded to the questions posed.

Nevertheless, the fair provided a quick and efficient way of interacting with a diverse group of farmer innovators in a brief space of time. Their perspectives in relation to local innovation and the capacity to innovate can bring in another pertinent dimension to the ongoing discussion.

The following key points sum up the findings of this short study in relation to smallholders' perspectives on the capacity to innovate:

- Farmer innovators are inherently curious and adventurous individuals, self-starters, who take risks, withstand criticism, persevere despite the odds, and strive towards their goals. They also have particular skills, such as to observe, analyse and compare, that enable them to engage in exploration and experimentation.
- Farmer innovators are often supported in their endeavours by family members, neighbours and other people in their farmer groups/cooperatives, communities and other social networks.
- With regard to interaction with external agents in agricultural research and development, farmer innovators have had both positive and negative experiences. They value the support received from such external agents in the form of training/coaching, funding, provision of equipment etc. But, at the same time, they do not feel their innovative work is duly recognised by external agents, who give the impression of feeling superior to the farmers, and some innovators even fear being exploited by the external agents. There is a need to build greater mutual respect and trust between these groups of actors in agricultural innovation systems.
- Farmer innovators call for more recognition to their work and feel that extension agents and researchers (and other external service providers) should link to and work together with them in participatory research. They have clear ideas of how external service providers could support them.
- Access to a range of resources, including funds, is considered by farmer innovators as crucial to enhancing the process of farmer-led local innovation. But they also highlight

the need to be able to access resources in ways that are tailored to their specific circumstances – not necessarily in large amounts but over a long period of collaboration.

ANNEXURES

Annex 1: Checklist for interviews with farmer innovators

1. Features of the innovation

1.1 After brief greetings and explanation of the aims of the interview, the farmer innovator describes his/her innovation (What is it about? How does it work? etc)

1.2 What measurable/observable results have been obtained thus far with the innovation?

2. The process of developing the innovation over time

2.1 Why was the innovation developed? (What was/were the perceived problem/s that the innovation was trying to solve? What were the opportunities that were being seized in developing the innovation?)

2.2 When was the innovation developed? How much time did it take to develop the innovation?

2.3 Where was the innovation developed? Where did the idea come from?

2.4 Who were the real actors in developing it? Examples: (1) family members (spouse, children etc), (2) other farmers, (3) external agencies, etc.

2.5 What does the innovation consist of?

2.6 How was the innovation developed?

3. Vision/perception of the innovator about his/her capacities to discover or develop new and better ways of doing things (“capacity to innovate”)

3.1 What does a farmer innovator need to have to be/become a better / more efficient innovator?

3.2 What helped the farmer innovator discover or develop new and better ways of doing things? What different positive elements or factors³ encouraged him/her to innovate? (positive elements or factors that could then be prioritised, if possible, and reasons given for the level of priority of each element/factor).

3.3 What constrained him/her for doing it? What different negative elements or factors were impediments in the process? (negative elements or factors that could then be prioritised, if possibly, and reasons given for the level of priority of each element/factor).

3.4 How did the innovator deal with the negative elements/factors? How were negative situations in the process overcome?

4. Recommendations/messages of the farmer innovator, putting the emphasis on:

4.1 Actions that reinforce the positive elements/factors.

4.2 Actions that allow to deal with the negative elements/factors.

³Factors could be with respect to 1) him/herself, (2) other farmers and the farming community and (3) external agencies. These factors/elements could be social, organisational, cultural, institutional, environmental, biophysical, political, economic, seizing opportunities (e.g. travel, visits, markets, training, neighbours etc), constraints perceived, links forged, networks etc.

Annex 2: Summary compilation of responses from farmer innovators interviewed

	Type of innovation	Key results obtained from innovation	Process of innovation development	Innovator's view of characteristics of an effective farmer innovator	Factors that favoured local innovation	Factors that constrained local innovation	How innovator dealt with constraints to innovation	What can be done to enhance local innovation processes	What can be done to alleviate constraints to local innovation processes
Female innovator: Yombo Naomi (48 years) Benin	Using compost in <i>zai</i> pits and on broadcast plots (production technique)	<p>With the <i>zai</i> pits, there is a kind of localised ploughing and there is more water for the crop.</p> <p>With the compost, the soil can store more water.</p> <p>Increased profits.</p>	<p>In the face of non-sustainable land management (land degradation, erosion, lower soil fertility, desertification etc), she decided to try using compost and the <i>zai</i> technique (introduced by an external agency).</p> <p>She made the <i>zai</i> pits with a hoe and put in ripe compost to serve as a seedbed.</p> <p>Her own informal experimentation consisted of comparing the success of sowing in compost in <i>zai</i> pits with broadcast sowing in fields.</p>	<p>Is not lazy.</p> <p>Works with the head.</p> <p>Seeks to compare things and to appreciate the advantages in all initiatives undertaken.</p> <p>Perseveres in initiatives and, if things work, knows how to convince others to be likewise persevering.</p>	<p>Technical training received (composting and <i>zai</i>) and availability of equipment from external agencies.</p> <p>External support to make compost.</p> <p>Introduction of organic farming in the area stimulated innovation process.</p> <p>Presence of the park where one is granted plots only if such an innovation is used.</p> <p>Circle of acquaintances: assistance from husband and children.</p> <p>Support and encouragement from members of the cooperative.</p> <p>Own free will.</p> <p>Good integration into the working group.</p> <p>Tenacity.</p> <p>Personal openness to novelties (new people and new techniques like <i>zai</i>).</p>	<p>Low rainfall.</p> <p>Access to land.</p> <p>Transport of organic matter.</p>	<p>Paying attention to nature.</p> <p>Adapting to irregular rainfall: early sowing and using short-season varieties.</p> <p>Applying the <i>zai</i> techniques because of the scarcity of rain.</p> <p>Access to part of my husband's land but the land problem remains for women. Because of the park, access to land is limited for everyone in the village; therefore they started crop rotation.</p> <p>Using a donkey cart thanks to external support, but the problem of transporting organic matter remains no matter where you make the compost.</p>	<p>A meeting like this innovation fair should be held regularly so that farmer innovators can meet each other and exchange experiences.</p> <p>Encourage women to commit themselves to local innovation.</p> <p>Appreciation of everyone who is involved in the process of developing one's innovation.</p>	<p>The blockages are not inevitable; you need to keep trying to bypass the difficulties and to seek solutions.</p> <p>Always look for alternative techniques (e.g. minimum tillage if <i>zai</i> cannot be used).</p> <p>Negotiate with her husband to have access to more land.</p> <p>Use local means of transport and not look to outside to obtain means of transport.</p>

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Female innovator: Asséta Ouedraogo (38 years) Burkina Faso	Biopesticide for vegetable plants (plant treatment product)	<p>Pests in vegetables eliminated within a week after applying biopesticide.</p> <p>Biological product does not have bad effect on the plants treated or on the soil or water.</p>	<p>Because of the recurrent diseases in the vegetable crops such as tomato and the high cost of insecticides, the Koubrinaam women's association started 10 years ago to spray the plants with a mixture made from the leaves of neem, tobacco and 'cailcédrat' (<i>Khaya senegalensis</i>, African mahogany)</p> <p>From the very beginning, it was a joint idea of the women's group.</p>	<p>Capacity to continuously collect ideas by taking part in fairs and to put the ideas into practice in the form of experiments.</p> <p>Capacity to join together with other people to exchange ideas and experiment with the ideas accepted by the group.</p>	<p>Technical (training), material and financial support by external agency.</p> <p>Regular visits to the association from Diobass-Burkina Faso.</p>	<p>Leaves of neem, tobacco and African mahogany are not available year-round.</p> <p>Insufficient supply of neem and tobacco unless you pay for it.</p> <p>Long distance to areas where African mahogany leaves can be collected.</p>	<p>Making nurseries for neem trees.</p>	<p>Training.</p> <p>Exchange visits.</p> <p>Regular visits to members of the association.</p>	<p>Plantations of trees like neem to guarantee that the innovation process can be sustained.</p>

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Male innovator: Lassané Savadogo (62 years) Burkina Faso	'Manegre' or cellar or storage silo (technologies for preserving potato, onion and yam)	Better preservation of produce. Better prices by selling at a good time. Reduction in costs of preservation. Combating genetic erosion of market vegetable crops. Availability of vegetable seed at the right time.	Because of the slump in the market and very low prices for vegetables at harvest time, the poor preservation of the produce, the scarcity of seed and the high costs of electricity for refrigeration, the innovator came up with the idea of 'manegre' in 2004. It was his own idea based on his experience but the inspiration is from traditional wisdom, and the innovator's family members helped him.	Confidence in oneself and one's capacities. Liking what one is doing and persevering in one's initiatives. Daring to take risks. Realising that the notion of wealth/ poverty is very relative; being convinced that one can be poor financially but not mentally. Banning afro-pessimism.	Circle of acquaintances: first relatives, then wife and children, gave encouragement. Encouragement from a better-off neighbour ⁴ who believed in the initiative (including the hard physical work of making <i>zai</i> pits). Assistance from the association president in disseminating the innovation. Financial support from the World Bank in popularising silos to store onions. Financial support from Swiss Cooperation to buy doors and frame for the 'manegre'. Encouragement and financial support from Swiss Cooperation (320,000 FCFA). ASSOCA international: grant for 3 years to support innovation.	Limited financial means. Not easy to acquire land. Administrative difficulties to buy land. The researchers in INERA gave no encouragement to or recognition of the innovation. Lack of support from research to improve the innovation and lack of means to disseminate it. Costly service of researchers and risk of seeing one's ideas being exploited by research with nothing in return.	Funds generated from revenues of agricultural activities. The money was used to buy land.	The innovators first of all need confidence in themselves and their knowledge. Shift in mentality of political and customary authorities is needed to support local knowledge and farmer innovation. Reflections are needed on how to support local innovation and innovators. Farmer innovations should be documented. Development politics should not be confused with power politics. Scientific knowledge should go out and serve the farmers in the field.	The government should encourage and take care of farmer innovators (as was done in my case by the external agencies mentioned). Intellectual property rights of farmers should be protected. Protect farmers' knowledge. ('My innovation on the storage silo is now well disseminated but that brought me no benefits.')

⁴ This neighbour told me: 'I have the money but I'm not ready as you are to put the money into *zai* pits.'

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Male innovator: Samaki (41 years) Cameroon	Awareness-raising and facilitation: creating a producers' association (institutional innovation)	<p>The diaspora has linked to the internet site of the federation and is informing itself regularly about local activities.</p> <p>The federation is better known by funders.</p> <p>Better information on the activities in rural areas.</p> <p>Monitoring of investments planned by the government and of information of actual achievements.</p> <p>Correct information spread and hunting down of false reports.</p>	<p>Because of the poor returns and benefits to producers. The weak commercialisation of products (e.g. yam), the lack of good information provided to producers and decision-makers, the innovator proposed in 2009 a better visibility of producers through an internet site which also has the advantage of providing more reliable channels of information and better marketing of products and easier access to subsidies. The innovator belongs to a federation of producers.</p>	<p>Very observant to identify problems, analyse them and find ideas to solve them. The solution is the innovation.</p> <p>Being open to others.</p> <p>Not being afraid of criticism.</p>	<p>Open-mindedness.</p> <p>Quick understanding.</p> <p>Positive attitude of the founding members of the federation.</p> <p>Support from external agencies in structuring the groups and managing the people, assets and training.</p> <p>Adoption of new information and communication technologies (ICT).</p>	<p>Innovation not well accepted at the beginning by the local government officials who were profiting from the system in place.</p> <p>Obstacles from entrepreneurs who were profiting from agricultural and marketing activities.</p> <p>Obstacles from the people who were falsifying project reports.</p>	<p>Courage et perseverance in his vision.</p> <p>Keeping sight of the goal.</p>	<p>Correct dissemination of information from the ground and avoiding made-up reports going to decision-makers and funders.</p> <p>Setting concrete project targets for empowerment of the beneficiaries.</p> <p>Plan a programme/ section to monitor project beneficiaries even after the end of the project. This would permit measurement of the real impact at the farmers' level.</p>	<p>Assistance in better management of farmers' incomes; otherwise, they risk to ruin their income all at one go.</p>

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Male innovator: Joseph Abarike (54 years) Ghana	Fish feed (production technique)	<p>Reduced expenditures for acquiring fertilisers.</p> <p>Reduced use of chemical insecticides.</p> <p>Reduced expenditures for fish feed.</p> <p>Good feeding of fish.</p> <p>Reduced fish imports.</p>	<p>Because fish need supplementary feed and good growth of micro-organisms, but chemical fertilisers and imported fish feed fish are expensive, this innovator in fish farming started in 2010 to use manure and locally made fish feed and leaves of the neem tree in his fishpond. When the water from the pond is recycled, it is rich in nutrients and in active insecticidal substances and can thus serve as liquid fertiliser and insecticide for crops.</p> <p>To develop his idea for fish farming, the innovator was inspired by the experiences of the Ministry of Health's programme for feeding malnourished children. Later, family members, agricultural advisors and the ProInnova programme encouraged him.</p>	<p>Above all, the innovator must have a strong personality so that people listen to him when he talks.</p> <p>The innovator should master some local languages and be able to communicate with other foreign partners; some basic knowledge of English and/or French is an asset.</p>	<p>The desire and determination to innovate and to make it public.</p> <p>Motivation to find simple ways to do things.</p> <p>The agricultural advisory service's recognition of the relevance of the idea and the interest shown encouraged me to forge ahead with the innovation.</p> <p>Innovation fairs like FIPAO in which I was invited to take part greatly encouraged me.</p> <p>Encouragement by community members who often called upon my local knowledge and practices.</p> <p>Material assistance for my pond (e.g. waterpump) from external agency.</p>	<p>Financial constraints</p> <p>Lack of services of interested and encouraging experts who don't risk killing my ideas and innovation.</p> <p>Enclosure to keep out wandering animals.</p>	<p>Creation of sources of revenue such as through livestock keeping to produce savings to be able to deal with financial constraints.</p> <p>Construction of an earth wall reinforced with planted trees as living fence.</p>	<p>Funding sources need to be ensured for local innovation and to provide financial support for farmer innovators.</p> <p>It is necessary to promote local innovations and local knowledge because they can reduce the effects of climate change.</p> <p>Not being content only with scientific knowledge but also promoting the knowledge and know-how of the farmers.</p> <p>Organise regularly farmer innovation fairs.</p> <p>Farmer innovators should be recognised, motivated and encouraged (as is the case with this fair) and become used to delivering their messages to the surrounding community.</p> <p>Invite farmer innovators to schools to present their innovations to pupils and create for them a 'learning centre' about farmer innovation.</p>	<p>Scientists should provide scientific support (bring added value) to farmer innovation.</p> <p>Scientists should help validate farmer innovations that affect many areas and could be disseminated by agricultural advisors with the support of Ministries of Agriculture. This would create employment for young people, reduce the effects of climate change and improve food security.</p> <p>Agricultural advisors should not only have knowledge but also the resources to be able to interact with farmer innovators to address the numerous challenges.</p> <p>The interest of the youth in agriculture should be generated through specially created 'learning centres' where the youth can learn from farmer innovators.</p> <p>Research results should not remain in drawers but should be combined with local initiatives and innovations.</p>

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Female innovator: Aminata Dembele (52 years) Mali	Biopesticide (plant treatment product)	Higher yields from vegetable crops. Reduced use of industrial pesticides. No negative impact on the environment.	Because of the recurrent damage caused by pests in vegetable crops such as tomato, the innovator started using biopesticide made of the leaves and stalks of a local plant called ' <i>Potokolonimbo</i> '. The crushed leaves and stems are mixed with water and the resulting solution is used to control pests in tomato plants. It was the innovator's own idea but inspired by traditional knowledge in pest control using the same plant on the scalp. The innovation is now well disseminated in the neighbouring villages. The innovator belongs to a mixed group of men and women farmers.	Good communication with others about what one wants to do. Observation capabilities. Knowing how to make the link between the way things were done before and the nature and reality of doing things today. Knowing how to make the link between what used to be available and what is now available.	Group experimentation (starting with 8 women and 3 men in the village who agreed to do a joint experiment to test the biopesticide. Children from the villages who go to school elsewhere (Bamako) and girls from the village who married into neighbouring villages played a role in spreading news about the innovation. Participation of villagers in the experimentation in terms of the number of farmers experimenting with the pesticide.	Labour constraint because the experimentation demands regular application of the biopesticide every 3 days.	No solution for the moment with regard to the labour constraint.	All development partners should take farmers' solutions as a starting point for participatory research. Promote exchange visits between farmers and provide them the space to express themselves about their activities. Leaflet for policy lobbying among funders about farmer innovation.	No response.

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Male innovator: Nouhoun Traoré (38 years) Mali	Incubator made of 'banco' (mud mixed with straw) (poultry production technology)	Increased incubation capacity. Good way to generate income for resource-poor farmers.	Because it was difficult and expensive to obtain conventional wooden incubators, which also have limited brooding capacity, the innovator developed an incubator made of 'banco' that can be easily reproduced using local materials. Source of the idea: the innovator had a wooden incubator with limited incubation capacity. He started thinking about how to increase the capacity and decided to make his own 'banco' incubator, of which he gradually increased the incubation capacity.	Ongoing desire to progress with the work. Reflecting on a problem and seeking solutions based on what already exists and seeing how one can improve to achieve a result. Able to anticipate. Being proactive. Being patient and observant. Keen to exchange with other people about what one is doing.	Patience and ability to observe. World Neighbors provided a wooden incubator equipped with a thermometer and a heat lamp, and that served as a source of inspiration. Technical and material support from PROFEIS-Mali.	Sabotage ⁵ of the chick-rearing activities in the 'banco' incubator, and some community members ridiculed the innovator. Non-mastery of how to use the thermometer to measure the temperature inside the incubator. High mortality rate of guinea fowls Being illiterate made it difficult to monitor the innovation effectively.	Patience et tolerance without resorting to complaining to the police. Exchange in chatting and maintaining a spirit of listening to others. Estimating the temperature of the eggs by body contact to the cheek. Contact with the network of guinea-fowl producers who use local products to increase the survival rate of the birds. Farmer's memory (but because of illiteracy, some things were forgotten during the course of innovation).	Exchange visits about innovations (e.g. innovations using solar energy interest him).	Organisation of complementary training for farmer innovators related to their innovations (including value addition). Promoting participatory activities/ research in the villages. Literacy training to be able to monitor the innovation. Raise awareness among the local population about the relevance of farmer knowledge. Leaflet to show the relevance of farmer knowledge that is complementary to scientific knowledge of researchers and agricultural advisors. Leaflet to how the active role farmers can play in development. Promoting collective action in the community. Don't leave the farmer innovators working in isolation.

⁵ There were even attempts to kill the innovators' chicks. At the start, people thought the innovator was a lunatic.

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Female innovator: Aminta Hassini (28 years) Niger	Community radio (communication technique)	The broadcasts have a positive impact on the people especially with regard to education, production and productivity, use of fertiliser, schooling and social cohesiveness. Change in behaviour and mentality within the communities.	Because if the need to fill the void in information, communication, animation, awareness and education in the population in several parts of Niger, Mooriben ⁶ started community radio in 2005 with the technical support of SOS Faim.	No response.	Collaboration with existing media (print media, public and private radio, community radio). Financial support from the NGO SOS Faim. Additional funding coming from various sources. Income generated by the radio itself.	Lack of financial support from the government through the Press Support Fund in Niger. The programme broadcasters are poorly compensated volunteers who eventually lose their enthusiasm. Lack of on-the-job training for broadcasters. Lack of diversification of programme, which reduces the degree of listening to local people's voices. Defective equipment or poor mastery of the equipment by broadcasters.	Training of broadcasters in appropriate audio skills. Diversification of radio programmes. Follow-up support to broadcasters to make them professionals. Training of broadcasters in radio management so that they generate revenue to make community radio economically viable.	Training of broadcasters in community radio so that they can draw up strategies for business plans, do the marketing and generate economic benefit to pay the staff and thus make community radio viable.	The Government of Niger needs to review its audio-visual communication act and include community radio among the beneficiaries of the Press Support Fund in Niger.

⁶ Mooriben means in the local language 'misery is over'.

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Male innovator: Hamadou Oumarou (50 years) Niger	Clearing aquatic weeds from ponds (natural resource management technique)	<p>Aeration of the ponds for fish farming (after stocking) or rice farming.</p> <p>Lasting protection of water bodies.</p> <p>Skill development of members of water-body management committees.</p> <p>Ensuring increased resilience of male and female farmers to ensure food security and to deal with climate change. Selling fish permits purchase of cereals and establishment of community cereal banks. The weed typha, when composted, serves to fertilise the fields.</p>	<p>Because of the proliferation of aquatic weeds (e.g. typha) that infest water bodies and block irrigation canals, the increasing number of grain-eating birds on bodies of water that destroy much of the grain harvest, and the urgency to become organised to ensure food security, the innovator started in 2000 to clear the vegetation in water bodies to be able to practise fish and rice farming.</p> <p>The innovator belongs to an association that was trained by an NGO in self-advancement.</p> <p>The idea of clearing vegetation from the water bodies emerged during a meeting of the Management Board of the association; the innovator was the first volunteer to experiment with the idea using his own resources. His aim was to improve the clearing technique that he knew from earlier project attempts. Farmer groups later experimented with the technique.</p>	<p>Someone who reflects all the time to find ways and means to ensure food security in the community.</p> <p>Observative and creative.</p> <p>Ready to share his knowledge.</p> <p>Gifted in bringing people together in the community.</p>	<p>Own improved technique inspired by vegetation-clearing practices tried by earlier projects but not continued and not effective in controlling typha.</p> <p>Support of the association's Management Board.</p> <p>Support in manual labour from friends and children.</p> <p>Small amounts of funding from the Partner NGO (Amis de la Terre) and the Global Environmental Facility (GEF).</p>	<p>Period for clearing vegetation coincides with work in the field, therefore weak participation by the local people.</p> <p>Financial problems because there was no renewal of funding, whereas the community activities to clear the vegetation continued and increased.</p> <p>Problems with equipment (nets, scales and buckets)</p> <p>Lack of training in management of water bodies.</p>	<p>Raising awareness among the local people.</p> <p>Physical contribution of farmers to compensate for the shortfall in funding.</p>	<p>Promote and support local innovation and farmer innovations for food security.</p> <p>Clearing of vegetation from water bodies and stocking with fish as an easy technique for fish farming to ensure food security.</p>	<p>The donors who want to support local innovation and farmer innovations should give more time for implementation and give preference to granting small amounts of funding over a long period.</p>

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Male innovator: Djibo Mounkeila (40 years) Niger	Systems of rice cultivation outside of the development scheme (production systems)	Restoration of the normally poor soils in the Sahel and rehabilitation of land. Production of rice in wetland areas that are not suitable for growing cowpea, millet or sorghum.	Because there are several semi-permanent pools with run-on water and many flood-prone areas that are not good for growing cowpea, millet or sorghum and because it is necessary to meet food needs of the village family members as well as to set up income-generating activities at the local level, the innovator started to develop rice-cropping systems for such areas. It was the innovator's own idea. After having worked since 2002 in an NGO (AGDL) to produce rice in flood-prone and remote areas not along the Niger River, he decided to develop 8 systems for producing rice on such land. Since 2014, his innovation is in the process of being patented, with the support of AgriProFocus.	Being optimistic, enduring, patient, hardworking, persevering despite obstacles. Know how to listen to one's intuition. Know how to take risks and not be afraid of criticism.	Personal background of innovator in passing through different stages of life (learnt in rice fields, then observed vegetable production, various internships and trainings, environmental advisor, then student at University of Montreal and now with Master II degree in management security and the environment). Encouragement from his relatives. In 2014 assistance of AgriProFocus to gain some personal visibility, e.g. through innovation fairs, publication of articles etc.	Reluctance on the part of local people. Superiority complex of rice experts who saw the innovator as a potential rival.	Raising awareness and dialogue with the people to let them know that they are the ultimate beneficiaries of innovation. Being receptive to these rice experts to show that also they have a role to play in innovation and the actions of others are complementary.	Place importance on farmer innovations, link the innovators with each other and support the efforts of the innovators so that the rural communities can benefit from the results of local innovation processes they have created.	Do not exclude innovators in development strategies. Seek complementarity of ideas and competencies in development. Strengthen personal capacities by means of a diploma course related to innovation. Such a course would avoid the superiority complex shown by those who call themselves doctor-experts in rice.

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Male innovator: Serigne Dieye Senegal	Promoting and transforming family farms (institutional innovation)	<p>Shared and responsible management of the family farm.</p> <p>Strengthened social cohesiveness and understanding in the family.</p> <p>Stimulation of personal creativity and initiative within family members.</p> <p>Dialogue and collaboration in decision-making with the family.</p>	<p>In view of the precariousness of family farming, the crumbling of cohesiveness in the families and the revolt of some family members, particularly the youth who distance themselves from carrying out work within the family, the innovator turned away from the traditional way of managing family farms (management solely by the family head) and started in 2001 a system of shared roles and responsibilities among family members. The innovator himself initiated the idea and was encouraged by his farmer group 'Boka Diom'.</p>	<p>Dialoguer in decision-making within the family and having a spirit of openness and encouragement to personal initiatives of each family member.</p>	<p>Empowerment of each family member.</p> <p>Openness to personal initiatives of each family member.</p> <p>Stimulation of family solidarity for personal initiatives.</p> <p>Training received through 'Jig Jam' association.</p> <p>Encouragement and material support (seed, livestock etc) from the 'Jig Jam' association</p>	<p>Lack of resources: livestock, forage, seeds and equipment.</p> <p>At the beginning, non-adherence to the innovation by some members of the 'Boka Diom' group.</p>	<p>Sound management of resources available to the family.</p> <p>Tenacity in the innovation so as to convince by virtue of the results obtained in the family.</p>	<p>The government should support family farms to practise shared responsibility and management so as to ensure food security.</p>	<p>Availability of good-quality seed at the right time.</p>

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Female innovator: Touti Senegal	Processing cashew nuts (production technique)	<p>Greater added value in cashew nuts.</p> <p>Higher prices and profits gained from selling cashew nuts.</p> <p>Higher family income.</p> <p>The women in the household become an income-generator and her husband shows her greater consideration.</p> <p>Reduction in drudgery and dangerousness in processed cashew nuts.</p> <p>Children can be sent to school thanks to the revenue generated by the mothers involved in processing cashew nuts.</p> <p>Reduction in rural exodus of girls who can make a living in the village by selling processed nuts.</p>	<p>Because of soil salinisation, lack of arable land and the decline in agricultural yields, the innovator started in 2001 a system of organisation for processing and marketing cashew nuts.</p> <p>She belongs to the women's group 'Fass Diom'.</p>	Pro-activeness and using local potentials.	Support of an NGO to the group in acquiring more appropriate processing equipment and skills that spared them from injury such as burning the hands, suffocation from roasting gas, watery eyes etc.	<p>Local unavailability of nuts because of competition of Indian traders in cashew nuts, intermediaries who reap many benefits from the nut trade.</p> <p>Too high interest rates when the group requested bank loans.</p>	<p>Supplementary purchase of nuts but at a high price.</p> <p>Elimination of intermediary traders by setting up sales points at the entrance of the cities of Rufisque and Dakar.</p>	<p>Set up more modern structures for processing cashew nuts. This would reduce the workload for the women processors and free up time that they could devote to other activities such as trade, marketing gardening, dressmaking etc.</p>	<p>Set up funds for local innovation (even in the form of loans with low interest rates).</p> <p>Establish nurseries for cashew trees so as to ensure sustainability of the innovation.</p>