

Small-scale farmers' perspectives on what enhances capacity to innovate

Chesha Wettasinha¹, Jean-Marie Diop², Laurens van Veldhuizen³, Ann Waters-Bayer⁴ and Boru Douthwaite⁵

¹PROLINNOVA International Support Team, Royal Tropical Institute, Amsterdam, Netherlands

²PROLINNOVA International Support Team, Brussels, Belgium

³Royal Tropical Institute, Amsterdam, Netherlands

⁴PROLINNOVA International Support Team, Göttingen, Germany

⁵Independent consultant, Ireland

Abstract: Agricultural research and development (ARD) agencies are now more aware of the importance of enhancing capacity of small-scale farmers to innovate and to become better able to adapt to new conditions, problems and opportunities. Challenges for these agencies include: i) monitoring and evaluating changes in capacity to innovate (C2I) at individual and community level as a result of their interventions; and ii) using the monitoring and evaluation (M&E) process as a means for all stakeholders in ARD to learn about what favours and constrains local innovation. Usually, the intervening ARD actors develop the M&E approaches, criteria and indicators to use. In order to better understand the factors that influence C2I from the perspective of small-scale farmers, a mini-study was carried out among 12 such farmers who showcased their innovations at the West African Farmer Innovation Fair in May 2015. The study explored what they saw as the main factors that strengthened local C2I. Semi-structured interviews revealed that many factors identified by the farmers were similar to those identified by intervening agencies, but other factors were mentioned only by farmers, e.g. the role of supportive family members, neighbours and others in their social networks in the innovation processes. Although very limited in scope, this mini-study indicated that there is more to C2I than intervening ARD agencies may expect. This paper calls for attention to this essential yet neglected aspect – the perspectives of small-scale farmers – in evaluating programmes that seek to build C2I as part of their theory of change.

Key words: agricultural innovation systems, capacity to innovate, emic perspective, farmer-led research, local innovation, monitoring and evaluation

1. Introduction

Agricultural research and development (ARD) agencies are now becoming increasingly aware of the importance of enhancing capacity of small-scale farmers and their communities to innovate (e.g. FAO 2014, Leeuwis *et al* 2014, Atta-Krah *et al* 2015) and thus become better able to adapt to new conditions, problems and opportunities – in other words, to become more resilient. A relatively new challenge for these agencies is how to monitor and evaluate changes in this capacity as a result of their interventions. How can outcomes be measured in terms of changes in capacity to innovate at individual, family and community level? At the same time, how can one use a process of monitoring and evaluation (M&E) as a means for all stakeholders in ARD – including the farmers and farming communities – to learn about what is stimulating and favouring and what is undermining or constraining capacity to innovate?

Developing relevant M&E approaches, methods and tools starts with clearly defining what C2I entails and what the key factors and parameters are that enhance or influence this C2I, in order to identify key indicators around which the M&E could be organised. Three system-oriented research programmes of the CGIAR group of international agricultural research institutes – Humidtropics, Dryland Systems and Aquatic Agricultural Systems (AAS) – had included enhanced capacity to innovate (C2I) as an intermediate development outcome in their respective theories of changes. Leeuwis *et al* (2014) therefore attempted to define C2I from the perspective of these research programmes, drawing on the work of a range of stakeholders, including civil society organisations. They identified some core capacities at the level of individual stakeholders and further capacities at the level of facilitators of system innovation that, together, would form a system’s capacity to innovate. Derived from their definition, the core capacities that contribute to an enhanced C2I at the level of farmers and farming communities would be:

- the capacity to continuously identify and prioritise problems and opportunities in a dynamic systems environment;
- the capacity to take risks, experiment with social and technical options, and assess the tradeoffs that arise from these;
- the capacity to mobilise resources and form effective support coalitions around promising options and visions for the future;
- the capacity to link with others in order to access, share and process relevant information and knowledge in support of the above; and
- the capacity to collaborate and coordinate with others during the above, and achieve effective concerted action.

Leeuwis *et al* (2014) stress that the facilitators of system innovation need to have a conceptual understanding of how change comes about and how to intervene effectively in order to enhance a system’s C2I. They were looking at the capacity of a larger innovation system – involving not only farmers and farming communities but also other actors in research, extension, private sector and government administration. Based on this view of core capacities that need to be strengthened, the CGIAR system-oriented research programmes began to design how they would measure changes in C2I within an innovation system.

This entry into designing an M&E system comes from the perspective of those seeking to facilitate innovation at a fairly high level of an agricultural innovation system. The international network PROLINNOVA (www.prolinnova.net) focuses on farmers at the grassroots level who are developing their own innovations – their own locally new and better ways of farming and managing natural resources – not because they are “pushed” by a project or by research or extension staff but rather on their own initiative, drawing on their own creativity in combining information and ideas from multiple sources, including their own ideas. In this approach to promoting innovation, the innovators are not primarily those who adopt what outsiders are instructing them to do. The C2I lies not only in the 2.5% of the farming population called “innovators” in Roger’s (1962) influential model on diffusion of innovations but rather, to differing degrees, among all farmers in the course of their “performance” (Richards 1989) in day-to-day farming. They innovate for a variety of reasons and differ from each other, depending on their situation, needs and opportunities, and

can be divided into several categories on this basis (see Box 1 for a categorisation developed by the authors of this paper). PROLINNOVA seeks to recognise and enhance C2I in all farmers – also the very poor – and to help farmers “perform” better through improved communication with each other and with outside actors and through greater self-confidence to take and keep the lead in participatory research and development.

Box 1: Which farmers innovate and why?

The work of the PROLINNOVA network and similar initiatives (e.g. in the ISWC, JOLISAA and PFI¹ programmes) and research by anthropologists (e.g. Nielsen 2001) have revealed a wide array of farmer innovators in different socio-economic situations and with different motivations. Some reasons for innovation that have been encountered and have also been articulated by farmers themselves are:

- Innovation out of dire necessity, motivated by extreme poverty, e.g. immigrants who have been allocated heavily eroded land and are struggling to produce something for their family to live on from this land are obliged to innovate (for examples from ISWC, see Reij & Waters-Bayer 2001);
- Innovation out of curiosity or “by accident”, often done by small-scale and resource-poor farmers, including women, but not very obvious to outsiders (e.g. Fetien Abay *et al* 2001); in northern Ghana, Tambo (2015) found that 35% of the farmers innovated out of curiosity;
- Innovation to deal with a specific challenge or problem, such as the woman innovator in Kabale, Uganda, who developed a low-cost solution to kill ticks and mites, derived from a leguminous tree that extensionists in the area promoted for improving soil fertility (Critchley & Lutalo 2006);
- Innovation to improve the local economic or ecological situation, such as the numerous farmer innovators encountered by PROLINNOVA who set up backyard botanical gardens to domesticate fast-disappearing wild plant species (Fetien Abay *et al* 2010), or a community in Senegal that set up a system for providing food for poorer families (Agrécol-Afrique 2013);
- Innovation as a pastime – these are usually better-off farmers who have the time and money to try new ways of doing things and, because they can afford to take risks, they can innovate in a bigger and more obvious way. For them, innovation is almost a “hobby” or “game”. They are perhaps closest to what Rogers (1962) refers to as “innovators”.

This categorisation does not mean that individuals or groups that innovate continue doing it for the same reason as when they started. Often, farmers who initially innovated out of dire necessity and managed to improve their livelihoods then started to try out new things simply out of curiosity. Similarly, better-off farmers who can afford to innovate as a pastime, if faced with a challenge, use their innovative capacity to find ways of getting around it. If C2I among farmers has been nurtured and strengthened, exploring new possibilities becomes second nature to them.

As a network trying to recognise and promote endogenous innovation processes in agriculture and to support farmer-led processes of research and development, PROLINNOVA saw a necessity to explore the “insider” perspective of farmers on C2I. How do innovative farmers, groups or communities regard themselves? What do they see as the main attributes of an outstanding local innovator? What do they see as the main factors that favour or constrain their own innovation processes? How do they assess as individuals, groups or communities whether they have become

¹ISWC: Indigenous Soil and Water Conversation (Reij & Waters-Bayer 2001); JOLISAA: Joint Learning in Innovation Systems in African Agriculture (www.jolisaa.net); PFI: Promoting Farmer Innovation (Critchley *et al* 1999).

stronger in terms of C2I (in whatever way they may express this capacity themselves)? The PROLINNOVA International Secretariat therefore carried out a small pilot study to explore views of small-scale farmers recognised as outstanding innovators in order to find out what factors form and influence local capacity to innovate in their own reality. This mini-study was supported by the CGIAR Research Programme on AAS, with co-funding from McKnight Foundation.

2. Pilot study on local perspectives on capacity to innovate

In May 2015, 50 small-scale farmer innovators from eight countries in West Africa gathered in Ouagadougou, Burkina Faso, to take part in the West African Farmer Innovation Fair. This provided a unique opportunity to start finding out what the elements and factors are that determine local C2I from the perspective of such farmers. Small multistakeholder teams in each country had selected these farmers as being particularly innovative. In the fair, they were able to present and share their innovations, learn from other innovators and interact with professionals in formal ARD, including policymakers, as well as the general public visiting the fair. More information on the fair can be found at www.fipao.faso-dev.net.

The pilot study was conceived and planned by members of the PROLINNOVA support team based at the International Secretariat in the Netherlands. Given the explorative nature of the study, the team decided to base it on focused semi-structured interviews so as to elicit the views of the farmer innovators on aspects related to local (small-scale farmer) innovation and C2I. The interviews were conducted by a Belgian-Senegalese researcher, a team member with longstanding experience in supporting farmer-led innovation development in Africa. In some cases, he could conduct the interviews in the local language of the farmer innovators; in other cases, he had to work through translators.

Using short descriptions prepared by the fair organisers about each of the 50 farmers selected by national committees to exhibit their innovations at the West African Farmer Innovation Fair, the study team selected 12 innovators for the interviews. It sought as diverse a group as possible in terms of the country of origin, sex and age of the innovator, and type of innovation. It shared its initial selection with members of the national committees for their review. Only in the case of Ghana did the national committee propose an alternative innovator to be interviewed. The farmer innovators selected comprised five women and seven men, who were interviewed in the midst of the fair for 1–2 hours each.

Table 1: Main characteristics of small-scale farmer innovators interviewed during the West African Farmer Innovation Fair

No.	Country of origin	Age	Sex	Innovation presented at fair
1	Benin	28	F	Using compost in <i>zai</i> pits and on broadcast plots (production technique)
2	Burkina Faso	38	F	Biopesticide for vegetable plants (plant treatment product)
3	Burkina Faso	62	M	'Manegre' or cellar or storage silo (technologies for preserving potato, onion and yam)
4	Cameroon	41	M	Awareness-raising and facilitation: creating a producers' association (institutional innovation)

5	Ghana	54	M	Fish feed (production technique)
6	Mali	52	F	Biopesticide (plant treatment product)
7	Mali	38	M	Incubator made of <i>banco</i> , i.e. mud mixed with straw (poultry production technology)
8	Niger	28	F	Community radio (communication technique)
9	Niger	50	M	Clearing aquatic weeds from ponds (natural resource management technique)
10	Niger	40	M	System of rice cultivation outside the irrigation scheme (production system)
11	Senegal	n.k.	M	Promoting and transforming family farms (institutional innovation)
12	Senegal	n.k.	F	Processing cashew nuts (production technique)

n.k. = not known

The study team had developed a short interview checklist in French to ensure consistency in terms of the information gathered. The checklist had five central questions, each of which was meant to generate discussions relevant for understanding farmers' views on C2I:

- 1) What are characteristics of a good farmer innovator?
- 2) What supports and facilitates local innovation processes?
- 3) What limits or constrains local innovation?
- 4) What would you recommend to strengthen local innovation processes?
- 5) What would you recommend to address constraints to local innovation?

In the first part of the interview, the farmer was invited to talk about his/her specific innovation (what it is, how it works, what it does and what results it brings) as well as about the process of developing the innovation over the years (why, what, how, when). This was followed by a deeper probing into the farmer's view on his/her C2I (without using this term) and finding out what had helped and/or hindered him/her in the process and what s/he thought could support and facilitate the innovation process. The key question in this regard posed to the innovators was: "What does a farmer innovator need to have in order to be or become a better or more efficient innovator?"

The study team compiled all responses and further comments made by the 12 farmers pertinent to each of the main questions in the checklist and recorded these in tables per farmer and per question. It identified the main issues most frequently mentioned by farmers under each question and, from this listing in descending order of frequency of mention, drew out the views of the farmers related to C2I and their suggestions for enhancing the process of local innovation.

3. Findings of the pilot study

As this was an exploratory study to discover different elements of farmer innovators' perceptions on C2I and involved a very small sample of only 12 farmers, it did not lend itself to quantitative analysis beyond the use of frequency tables. The responses of the farmers are clustered here according to the five central questions mentioned above:

- 1) **Characteristics of a good farmer innovator.** When describing good farmer innovators, the interviewed farmers referred to personality traits of innovators, their interest and skills in "research", their willingness to share, and their ability to communicate and collaborate with

others. As indicated in Table 2, they gave importance to personal characteristics that reflected research capacities in terms of analytical skills and the systematic comparison of alternatives, if needed, through experimentation. They emphasised the importance of communication skills for farmers to be able to access new ideas from various sources.

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

Key characteristics	Times mentioned
Personality traits	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
Interest and skills in "research"	9
Observation; analysis of problems and options; comparing / weighing alternatives; experimentation; able to link past practice with current conditions	9
Interest in and capacity to communicate and share	7
Communicating with and convincing others	5
Looking for/accessing new ideas; language capacity to access information	2
Openness and capacity for (facilitating) collaboration	4
Open to others; collaborating with others to experiment; bringing people together; dialogue within family	4

2) **Factors supporting and facilitating local innovation processes.** The responses of the farmers (Table 3) revealed the particular importance they attached to the support received from people in their immediate social networks such as family members, neighbours and cooperative members. They also regarded advice, training and funding from external agencies as important elements of support. They rarely mentioned supportive policies at any level.

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

Key factors	Times mentioned
Individual	8
Own interest, insight, open spirit	7
Own funds generated from innovation	1
Family	5
Assistance, encouragement from family members	5
Community	9
Integration in farmers' group; experimentation in a group	2
Encouragement from neighbours; villagers asking advice	3
Spread of innovation by cooperative or other villagers	2
Support, encouragement, technical advice by farmer cooperative or group members	2
External agencies	20
Training support; visit by technical staff; advice in organising and managing group	8
Recognition by government agency	1

Provision of equipment	4
Funding	5
Participation in innovator fairs; support to increase visibility	2
Policies	1
Agriculture and park management policies	1

3) **Factors limiting or constraining local innovation.** As constraints in developing their innovations, the farmers mentioned six main factors, as summarised in Table 4, which were – in descending order of frequency of mention – i) limited access to resources (land, labour, materials etc); ii) limited access to capital; iii) negative attitude of some external actors such as formal researchers; iv) lack of knowledge and skills such as literacy; v) inability to use certain kinds of equipment; and vi) opposition from parties within the community who feel that local innovation is a threat to their interests and established ways of doing things.

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

Key factors	Times mentioned
Resource-related constraints	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
Funding	6
Lack of funds; short-term funding only; high bank interest rates	6
Role and attitude of external agencies	7
Lack of recognition by researchers; their attitude of superiority; danger of researchers or 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 or 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 attitude	3
Sabotage by community members; reluctance; group members not following	3

4) **Recommendations to strengthen local innovation processes.** As indicated in Table 5, many of the farmers gave high priority to the wider recognition by other development actors that local innovation is relevant for development. They called for changes in project design, M&E, reporting and impact assessment that make space for “genuine” participatory research. They

mentioned the importance of creating opportunities for learning, sharing and networking such as innovation fairs, exchange visits and training sessions to enhance local innovation.

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

Key recommendations	Times mentioned
Promote relevance of local innovation	10
<i>General:</i> Change in mentality of local authorities and leaders to accept local innovation; general promotion of local innovation; local innovation as relevant as formal research; lobby with donors for promoting local innovation; give recognition and space to farmer innovators	7
<i>Specific:</i> Encourage women to innovate; improve documentation of local innovation; involve innovators in schools and in teaching	3
Provide 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
Facilitate 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 innovations	1

5) **Recommendations to address constraints to local innovation.** As can be seen in Table 6, the recommendations of the farmer innovators generally went in the same direction as under point 4 above), but two recommendations stand out: i) removing barriers to accessing the resources (land, labour, transport etc) needed by farmer innovators to carry out their work; and ii) changing the roles of external agents to be truly collaborative and supportive of farmer innovation processes, specifically that researchers should support local innovation processes through engaging in joint research, adding value, and providing training and coaching in relevant topics. In this regard, farmers mentioned the need for training to bring about attitudinal change in external agents so that they can better support local innovation processes.

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

Key recommendations	Times mentioned
Undertake 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

Promote relevance of local innovation	3
Local awareness raising on relevance of local innovation; argue complementarity between local innovation and science-based innovation	3
Give attention to 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; creating funding window to support local innovation	3
Funding support preferably in relatively small amounts but for longer periods of time	1
Change role of external agencies	9
Value addition by researchers to local innovation; validation of local innovation 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 farmer innovators in all development strategies	2
Training and coaching in financial management; training linked to local innovation to add value	2
Training for researchers and extension agents to open them up for recognising local innovation and to change their attitude	1
Promote community action	1
Promote collective action at community level	1
Create enabling 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
Create learning/training opportunities	2
Learning centres for young farmers interacting with innovators, literacy training	2

Overall, the farmer innovators referred mostly to local factors that directly influence their work and livelihood. Although they clearly defined how they thought the agricultural support system (making specific mention of extension agents and researchers) could best interact with farmer innovators, they made hardly any reference to the role of government policy. It is quite possible that relevant policies in the area of ARD indeed do not impact on their work, particularly in cases where the state is relatively weak and where formulated policies may not be implemented. In other cases, the farmers may not be aware that certain government policies are in fact partly responsible for the non-supportive behaviour of the ARD professionals they encounter.

4. Discussion: implications for M&E to enhance C2I

The brief study provided some insights into the individual perceptions of outstanding local innovators invited to an international farmer innovation fair. At such an event, the individual farmers are in the limelight and it is natural for them to focus on their particular technologies or niches, although they were asked to reflect on what favoured and constrained their capacity to innovate in a more general sense. Thus, their personal bias should be acknowledged in framing the findings in the discussions on C2I.

However, from the experience of PROLINNOVA partners engaged in longer-term interaction with farmer innovators in their community settings, the discussions in such settings throw light on local innovation also from the perspective of the group or community and refer more to the processes (rather than only the specific technologies) involved in experimentation, innovation and wider sharing. It was more difficult in the setting of a large fair in a country that is foreign (for most of the interviewees) to probe beyond issues related to the outstanding innovations that had been their “entry passes” to the fair.

Nevertheless, the study did reveal what these farmers viewed as being important in terms of favouring C2I at their level. Many of the key factors identified by the farmers that strengthened or constrained local capacity to innovate were similar to the factors that had been previously identified by field-based researchers and development actors, including those in the CGIAR system-oriented research programmes. However, the farmer innovators gave much more attention to the role of experimentation in innovation and acknowledged the role that supportive and appreciative family members, neighbours and others in local social networks played in the local innovation processes.

They also highlighted the importance of access to locally controlled resources to support their innovation processes (including locally controlled innovation funds). They pointed to aspects of their interaction with formal researchers and extension agents that indicate whether or not the local innovation system is functioning well. These aspects included: a) other ARD actors do not ignore local innovators and leave them to work in isolation; b) interaction between innovators and outsiders is in a participatory manner; c) outsiders add value to the innovators’ own work, at least by giving scientific validation to what they have developed; d) interaction between research scientists and farmer innovators becomes more frequent and continues to address new challenges; and e) interaction with staff in ARD agencies involves also training and coaching in financial management and in how farmers could derive more value from their local innovations.

The views of the interviewed farmers on what is important in terms of C2I at their level have important implications for programmes seeking to build C2I as part of their theory of change, particularly with regard to areas of interest, criteria and indicators to be taken into account when monitoring and evaluating these programmes. For example, one or more indicators in the M&E might reflect whether resources for experimentation and innovation are locally controlled, as the farmers explicitly highlighted the importance of this.

Nielsen (2001) stresses the anthropological distinction of the etic view (the view from outside) and the emic view: the perspective from inside, in this case, the perspective of farmer innovators themselves. In order to have a balanced picture of how C2I has been and can be enhanced, it would be necessary to seek both the etic and emic views. Moreover, it is quite likely that local perspectives on farmer innovation and on how innovative behaviour reveals itself and has been strengthened are specific to a country or ethnic group (cf. Nielsen 2001). For this reason, attempts to monitor and evaluate C2I always need to seek the internal perspective at the site in question. Moreover, examining the change in capacity together with the farmers and farming communities becomes part of the process of reflecting and learning at that level about the importance of innovation for the community and how different actors at the grassroots level can better play

their roles in contributing to innovation processes. This reflection process, in itself, can contribute to improving the functioning of the local innovation system.

Programmes seeking to facilitate C2I need to take the diversity among farmer innovators (see Box 1) into account, especially in monitoring C2I. The perceptions of diverse farmer innovators would need to be explored in depth in order to gain a balanced picture of what C2I is and how it can be enhanced and measured. Multiple and mixed methods would need to be applied to capture this diversity and to integrate it into an M&E system. Interviewing 12 outstanding farmer innovators at the West African Farmer Innovation Fair was an initial attempt to harvest an emic perspective. These farmers represented only a part of the diversity of innovators among small-scale farmers in West Africa. Judging by their innovations and the reasons the farmers gave for having developed them, these farmers were mainly in the third and fourth categories of innovators listed in Box 1: those who were innovating to deal with a specific challenge or problem, and those who were innovating to improve the local economic and ecological situation.

The interviews stimulated these individual farmers to reflect on what helped and hindered farmer-led innovation processes. Other methods that would stimulate wider, community-based reflection and learning could involve focus-group discussions with self-formed groups of farmer innovators in a given community, plus joint discussions by farmer innovators and other community members on this topic. It would also be possible to ask resource persons in the community to identify different types of farmer innovators in their midst and then to carry out case studies of the innovation pathways and factors that led to the enhanced C2I of these different types of innovators. All of these methods would require that the facilitators of such farmer-led M&E processes are skilled in building rapport with small-scale farmers and their communities, in stimulating discussion and probing, and in finding appropriate spaces to be able to have unhurried conversations with various stakeholders at community level, including women, elderly and youth.

Finally, it should be emphasised that the small study presented in this paper is exploratory work that needs further and deeper investigation. It is simply meant to flag the importance of including farmers' perceptions on C2I in designing relevant M&E systems. The small sample of farmers' perceptions does not allow for specific suggestions as to how such systems should be designed and which indicators could be used. The PROLINNOVA network plans to use this approach and the initial findings to continue to develop a system of monitoring C2I that is inclusive, regarding the perspectives of farmer innovators to be just as important as those of other ARD stakeholders. The network hopes this will contribute to understanding and strengthening C2I at grassroots level.

References

- Agrecol-Afrique. 2013. Caractérisation d'une innovation locale: lutte contre la soudure (insécurité alimentaire cyclique) dans le village de Pout Dagné, arrondissement et communauté rurale de Notto, Région de Thiès. Thiès, Sénégal: Agrecol-Afrique (www.prolinnova.net/sites/default/files/documents/Senegal/2013/gestion_de_la_soudure_a_pout_dagne-ag_profefs-ccafs.pdf).
- Atta-Krah K, Poire V & Koper E. 2015. Humidtropics, a CGIAR Research Program on Integrated Systems for the Humid Tropics. Tropentag "Management of land use systems for enhanced food security: conflicts, controversies and resolutions", 16–18 September 2015, Berlin, Germany

- Critchley W (ed.) 1999. *Promoting farmer innovation: harnessing local environmental knowledge in East Africa*. Regional Land Management Unit (RELMA) Workshop Report 2. Nairobi: RELMA / Swedish International Development Agency.
- Critchley W & Lutalo RS. 2006. Controlling ticks and influencing policy. *LEISA Magazine* 22 (3): 24–25.
- FAO. 2014. *The state of food and agriculture: innovation in family farming*. Rome: Food and Agricultural Organization of the United Nations.
- Fetien Abey, Mamusha Lemma, O’Flynn P & Waters-Bayer A. 2001. A challenge and an opportunity: innovation by women farmers in Tigray. In: Reij C & Waters-Bayer A (eds), *Farmer innovation in Africa: a source of inspiration for agricultural development* (London: Earthscan), pp155–167.
- Fetien Abay, Gandarillas E, Shrestha P, Waters-Bayer A & Wongtschowski M. 2010. Fundamentals of agrobiodiversity: promoting local innovation in managing agrobiodiversity. *Issues Paper People, Food and Biodiversity* Bas12-10-e. Eschborn: German Agency for International Cooperation (GIZ) Sector Project Sustainable Management of Resources in Agriculture.
- Leeuwis C, Schut M, Waters-Bayer A, Mur R, Atta-Krah K & 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.
- Nielsen F. 2001. Why do farmers innovate and why do they not innovate more? Insights from a study in East Africa. In: Reij C & Waters-Bayer A (eds), *Farmer innovation in Africa: a source of inspiration for agricultural development* (London: Earthscan), pp92 –103.
- PROLINNOVA International Secretariat and Jean-Marie Diop. 2015. Understanding “capacity to innovate and adapt” from a smallholder perspective. Leusden, Netherlands: PROLINNOVA International Secretariat / ETC Foundation.
- Reij C & Waters-Bayer A. 2001. An initial analysis of farmer innovators and their innovations. In: Reij C & Waters-Bayer A (eds), *Farmer innovation in Africa: a source of inspiration for agricultural development* (London: Earthscan), pp77–91.
- Richards P. 1989. Agriculture as a performance. In: Chambers R, Pacey A & Thrupp LA (eds), *Farmer first: farmer innovation and agricultural research* (London: Intermediate Technology Publications), pp39–43.
- Rogers EM. 1962. *Diffusion of innovations*. New York: Free Press of Glencoe.
- Tambo JA. 2015. *Farmer innovation in rural Ghana: determinants, impacts and identification*. PhD dissertation, University of Bonn.

Acknowledgements

The authors gratefully acknowledge the 12 farmer innovators for their willingness to participate in the interviews and to share their opinions and experiences. They also thank McKnight Foundation and AAS for co-funding this study, and AgriProFocus, the CGIAR Research Program on Climate Change, Agriculture and Food Security (CCAFS), the Collaborative Crop Research Program of McKnight Foundation, Misereor and the Swiss Agency for Development and Cooperation (SDC) for generously co-funding the West African Farmer Innovation Fair.