



NATIONAL INVENTORY REPORT: SOUTH AFRICA

Brigid Letty¹ and Joe Stevens²

¹ Institute of Natural Resources

² University of Pretoria

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TABLE OF CONTENTS

1	Background.....	1
2	The South African context.....	1
3	JOLISAA outcomes.....	3
4	Project activities associated with the inventory.....	4
4.1	Identification of innovation processes.....	4
4.2	Collecting information for the inventory	6
5	Analysis of the selected cases in the inventory	11
5.1	Location and scale.....	11
5.2	Description of the innovations as outcomes of the process.....	12
5.3	Dynamics of the innovation process.....	15
5.4	Innovation process dynamics and current status.....	19
5.5	Stakeholders and their contributions.....	20
5.6	Benefits.....	22
6	Discussion	23
7	References	25
	Appendix 1 List of people contacted in identifying innovation cases.....	26
	Appendix 2: List of 39 cases originally identified, 24 documented and 11 finally included in the inventory	1
	Appendix 3: Questionnaire sent to workshop participants	1

1 BACKGROUND

JOLISAA (Joint Learning in Innovation Systems in African Agriculture) is a European Union funded research project that is coordinated by the French research organisation, CIRAD, and operates in South Africa, Kenya and Benin. In South Africa, the project is hosted by the Department of Agriculture, Extension and Rural Development at the University of Pretoria. The JOLISAA project aims to increase understanding of multi-stakeholder innovation processes and recognises the benefit of combining different forms of knowledge, including local knowledge.

This report covers the first phase of the project which was the development of an inventory for each country that documents and describes examples of multi-stakeholder innovation processes that have relevance to smallholder agriculture. The inventory has sought to identify cases where local knowledge has made a contribution to the innovation process. The inventory has allowed for a broad understanding of innovation processes and their dynamics which will be explored in more detail through the next phase of the project, the collaborative assessment of three cases.

2 THE SOUTH AFRICAN CONTEXT

South African agriculture is frequently described as having a dual economy, with a commercial large-scale sector consisting mainly of white farmers operating on privately owned land and small-scale farmers operating within homeland areas under communal tenure. This arrangement is a direct result of the former legislation that saw black farmers not being allowed to own land as well as the establishment of homeland areas or Bantustans where blacks were allowed to settle and engage in subsistence agriculture while also providing labour for other sectors such as mining, manufacturing and commercial agriculture.

Since 1994, there have been efforts by the government to redress this situation through a number of pathways, including land reform (aiming at more equitable access to land), a refocus of the government research and development services to give attention to increasing the productivity of smallholder agriculture. There is some concern that the approach to strengthening the smallholder sector has continued to rely on technology transfer approaches rather than the use of participatory approaches that can allow for the development and adaptation of more appropriate practices and technologies. There is a continued recognition about the lack of uptake of externally developed technologies by smallholder farmers for a number of reasons, many of which are socio-economic in nature.

Multi-stakeholder innovation processes that actively involve smallholder farmers in the development of new systems and technologies seem to have potential to address this challenge. Furthermore, “villagers’ indigenous agricultural practices” have also been recognised as having potential value (Aliber and Hart 2009: 454), as are “participatory research, information dissemination and capacity building ...” (Ortmann and King 2011: 406).

Furthermore, small-scale farmers generally make use of a range of livelihood options and do not rely strictly on agriculture for their household food needs nor for their income generation needs. In fact, a range of different sources of income characterise rural households including remittances from family members working elsewhere, government social grants and casual work. But even when agricultural production is relatively small, it plays an important supplementary role, and given one estimate of “some 4 million people from over 2.5 million households, mostly residing in the former homelands ... are engaged in agriculture as a means of supplementing household food supplies” (Aliber and Hart 2009: 454), it cannot be overlooked. Efforts by government to commercialise agriculture in the former homelands do not always take into account this multiple livelihood strategy approach of smallholders.

Smallholder agriculture faces many challenges that limit the contribution that agriculture makes to household income. Amongst these are the lack of funds for households to invest in agricultural inputs, the loss of knowledge about agricultural production practices – exacerbated by the lack of involvement of this youth, which has not allowed for transfer of skills across generations. Inadequate infrastructure, in terms of roads especially has made it costly, and in some cases physically impossible, for farmers to move produce to markets. Combined with erratic production of relatively small volumes of produce and the lack of systems that have allowed for effective cooperation of farmers to meet market requirements, smallholders are generally limited to supplying the local market, which limits production substantially. In addition, smallholder farmers must compete with large-scale commercial farmers who supply products such as vegetables, meat and grain into the supermarkets, the municipal fresh produce markets, and even directly into the former homeland areas where they compete directly with locally produced goods.

If smallholder farmers are to be able to compete with large-scale farmers, even on the local market, they need to develop or adopt appropriate systems and farming practices. This project seeks to understand what gives rise to multi-stakeholder innovation processes that could allow for the development of technical and organisational innovations.

Government policy is starting to recognise the importance of innovation in addressing the challenges that face smallholder farmers but there is not always sufficient attention given to the contribution of local knowledge or farmers' own knowledge to the innovation process. Nonetheless, the *National Agricultural Research and Development Strategy* (Department of Agriculture, 2008) noted, albeit briefly, the importance of such issues as: broadening access and participation (p.3), articulating the needs of the Second Economy (p. 4), and strengthening the demand side of agricultural research (p.5). The *Strategy*, while focused on a technology transfer approach, highlighted that "One of the greatest challenges in the research fraternity is getting the technologies to the farmers who need these most and also that if innovation was to contribute to sustained and equitable development, there would need to be different modes of innovation that depended much less on such delivery-focused processes: *"The traditional linear approach of researcher-extension agent-farmer or end user is limiting in the current South African farming system. Other approaches, such as participatory action research and farmer-to-farmer learning are more appropriate"*. (p.12)

The decline in the number of commercial farmers in South Africa is well recognised (Nkwinti 2011). With this situation, it becomes even more important that the country finds ways to increase the productivity of the second economy so in order to ensure national and household food security.

It is within this context that Jolisaa has sought to gain a better understanding of innovation processes that have involved smallholder farmers in the process of developing relevant systems and technologies.

3 JOLISAA OUTCOMES

The objective of JOLISAA is to understand how innovation processes, involving technical, social and institutional innovation, unfold and to learn how they can be effectively supported and promoted in order to improve agricultural production and rural livelihoods.

The objectives of the inventory were several-fold:

- Take stock of the breadth and diversity of innovation experiences which meet our aim (JOLISAA's focus is on multi-stakeholder agricultural innovation processes and systems involving small holders, and the role of local knowledge in such processes).
- Provide a basic description about what is actually known and available about each case, so that we were in a position to classify cases and select cases for the collaborative assessment.

- Provide an opportunity to develop / strengthen linkages and networking with partners and resource persons at the country / regional and international levels.

Key lessons from the learning process will be shared through the final workshop and through other avenues such as project reports, the website (www.jolisaa.net), electronic newsletters and policy briefs.

4 PROJECT ACTIVITIES ASSOCIATED WITH THE INVENTORY

Those activities relevant to the development of the inventory are described below.

4.1 Identification of innovation processes

Innovation cases in South Africa were identified through a number of different avenues. The key approach was to make use of programmes and networks, in particular PROLINNOVA¹ and the South African Society for Agricultural Extension (SASAE)² that the members of the coordinating team were already involved with. Contact was also made with individuals and organisations that team members thought might be aware of relevant cases (See Appendix 1 for list of people and organisations contacted when seeking to identify cases – this included people invited to the initial stakeholder workshop). Discussions took place with possible case-holders to determine whether or not their cases would be relevant to Jolisaa. At the National Workshop held in Pretoria in November 2010, participants were given the opportunity to showcase innovation processes that they had been involved with. The market place also created awareness about the types of multi-stakeholder processes that existed in South Africa. On the second day of the workshop, decision-makers and policy makers from key organisations were also invited to participate in the workshop. Through the discussions that took place, a number of additional cases and contact people were identified. For example it was suggested that University of Fort Hare, University of Cape Town and Walter Sisulu University had research programmes that involved community partnerships. Other recommendations were Prof Norris from University of Limpopo, Noel Oettle from Drynet, the Centre for Public Service Innovation and Andy Hall. Where possible, follow up was made with relevant persons.

¹ An international network that promotes local innovation in ecologically oriented agriculture and natural resource management. The assistant national Jolisaa coordinator is the national coordinator of PROLINNOVA.

² The National Coordinator of Jolisaa is the outgoing president of SASAE

The following criteria or guidelines were used for initially identifying cases for inclusion in the inventory (they were also sent to potential participants of the first national workshop to identify cases to be showcased at the workshop’s marketplace): (1) Are they relevant to smallholders? (2) Do they show some level of novelty? (3) Are there multiple stakeholders?

The initial identification process led to a list of 38 possible cases being identified by the team (See Appendix 2). Of these, 24 cases were initially included in the inventory (See Appendix 2 for list of cases included). An additional three cases were identified when Hlami Ngwenya joined the coordinating team and they were included in the revised inventory.

4.1.1 Description of the inventory and analytical framework

An **analytical framework** was developed for use in the three countries to characterise roughly the inventory cases, with the aim to analyse and compare the inventory cases within and across countries. Concretely, the framework was declined in two complementary templates: a spreadsheet template, and a text template. The spreadsheet consisted of a series of variables describing in a semi-quantitative manner major dimensions of each innovation case (See Table 1) for which national JOLISAA national team members had to pick the appropriate pre-defined value (or class) in a closed drop-down list. The text template for its part allowed for the development of concise free-flowing narratives about key qualitative aspects of the innovation experiences. Both templates also included a few variables to assess the interest and actual potential for each case to be further investigated within the context of a subsequent “in-depth” participatory assessment.

Table 1: Main categories and variables used for the Inventory templates.

Theme / Dimension / variable	What JOLISAA tried to know about it	Tackled in Spreadsheet?	Tackled in Text narrative?
Innovation: type, nature, domain		Yes	Description
Stakeholders' roles & interactions	Who have been the lead or active stakeholders? What type of coordination has taken place among stakeholders?	Crudely	Table and description
Role of local knowledge	Has local knowledge played a role?	No	Very crudely

Innovation triggers & drivers	What have been the key triggers and drivers of the innovation process?	key categories only	in some details
Innovation dynamics	What have been the key phases the innovation process went through from t0 'til the present day	no	Main phases from t0 to today
Scale at which innovation is taking place	Whether the innovation process took place mainly at the local, regional, national scale, or at several scales?	Very crudely	In some details
Results and "Impact" obtained	What have been the effects so far, positive or negative, intended or not, in different dimensions?	Very crudely	Yes (list of results / effects of different kinds)
Availability of supporting documentation	What is already known / documented about this initiative?	yes	List of key references / resource persons

Source Triomphe et al, 2012.

Additional themes were dealt with in the templates but did not receive much attention as part of the inventory due to limited resources: coordination among stakeholders, nature of the innovation process, characteristics of the enabling environment, link between the innovation process and projects, etc. They will however be covered for selected cases in a subsequent collaborative assessment phase.

4.2 Collecting information for the inventory

A questionnaire was developed based on the Excel inventory spreadsheet and the narrative questions. JOLISAA was looking for cases related to any type and domain of innovation, conducted at any scale: from natural resource management to production and agribusiness, from technical innovation to organisational and social innovation, from local initiatives to initiatives implemented at national or regional level.

The questionnaire was sent to case holders in order to gather more information. From this it emerged that some cases were unsuitable (not really an innovation case or too early in the innovation process to be included), some case-holders were not able to share information due to their organisations' tight intellectual property rights policies. The reasons for not documenting the cases are included in Appendix 2.

The national workshop was used as a mechanism to identify cases – the invitation included the offer of presenting a case at the workshop at the ‘market place’. The invitation gave a number of criteria by which participants could ascertain whether their case would be suitable. For example whether a process had led to the development of an innovation that increased income, increased production and so forth, as well as whether it involved three or more stakeholders and whether local knowledge had played a role. For those who felt their case met the criteria, there was a basic structure of information to be presented for the case including locality, background, fields of innovation, types of stakeholders involved, the party responsible for driving the process, the role of smallholders, etc.

The participants sent the information back to the coordinating team who reviewed the case and engaged with the individuals regarding the medium they would use for presenting the cases at the market place. Most participants made use of existing posters rather than preparing something for the workshop. All those who responded to the request were accommodated at the workshop as it was felt that the variety of cases would enrich the process of defining an innovation case in terms of the Jolisaa project.

Following the documentation of the 24 cases in the inventory, they were again reviewed by the coordinating team to identify those that did not fit. The cases were only retained in the inventory if they met the following criteria: (1) experiences where at least 3 stakeholders had been actively involved (thus trying to avoid the many cases in which research entertains an exclusive relationship with a group of farmers), (2) experiences which were at least 3 years old (thus trying to target processes that were not in their infancy).

From the range of different cases explored up to this point, only 11 were finally selected for inclusion in the Excel spreadsheet and documentation of case summaries (See Appendix 2 for a summary of the cases finally included and see Appendix 4 for the case summaries). The eleven cases included in the inventory are summarised below.

Table 2: Summary of the eleven cases in the inventory

<p>Title: participatory research on improving soil fertility management</p> <p>Location: Vhembe District of Limpopo Province</p> <p>Mix of stakeholders: Smallholder farmers, researchers, extension officers, academic staff</p> <p>Description: This innovation involves a process of increasing farmers’ adaptive capacity to manage natural resources by combining local and external knowledge about soil fertility. At the same time, farmers’ organizational capacities were strengthened to increase their</p>
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bargaining power. Bulk buying of inputs was initiated to allow them to benefit from economies of scale. Various stakeholders contributed their knowledge, with smallholder farmers at the centre.

Title: Developing a low-cost protein supplement for chicks

Location: Msinga Local Municipality in KwaZulu-Natal

Mix of stakeholders: Smallholder farmers, NGO, Chicken interest group, expert introduced by NGO

Description: In this innovation process, smallholder farmers, with support from the NGO Mdukatshani Rural Development Trust (MRDT) adapted an external idea introduced by a poultry specialist to suit their context by using their own knowledge and resources. The main objective was to improve the diets of chicks during the winter. This was achieved by taking advantage of old, unhatched eggs, mixed with cooked maize meal (phuthu) and sunflower seed.

Title: Development of a community-driven maize seed production system

Locality: Limpopo Province

Mix of stakeholders: Smallholder farmers, research, extension, university, seed company

Description: This case documents the evolution of a community-driven system of producing maize seed that was suited to the local condition. It happened in response to smallholder farmers in Limpopo Province expressing the challenge of low maize yields. It shows how more than 10 different categories of actors were mobilised to create a common vision, harmonise their approaches and work together in response to the needs of the farmers.

Title: Testing a new cash crop and developing a new marketing arrangement

Location: Potshini, Okhahlamba Local Municipality in KZN

Mix of stakeholders: Smallholders, neighbouring commercial farmer, university outreach and NGO

Description: This case involves a group of smallholder farmers who wanted to diversify their farming activities and start producing a new cash crop. Through discussions with a neighbouring commercial farmer, one of the farmers identified a market opportunity for cherry peppers. The innovation process, supported by Farmer Support Group (FSG), has

involved both technical innovation (the introduction of a new crop) as well as institutional innovation (development of a marketing relationship).

Title: Developing an irrigation management tool

Locality: Limpopo, Mpumalanga, Northwest and Western Cape Provinces

Mix of stakeholders: Smallholder and commercial farmers, university researchers, private sector manufacturing company, research organisation

Description: Researchers at the University of Pretoria and the Commonwealth Scientific and Industrial Research Organisation (CSIRO) in Australia, drawing on knowledge gained through other irrigation-related programmes working with farmers, developed a simple irrigation-scheduling tool called a wetting front detector. They then fine-tuned the tool (and how it is used) through interaction with commercial and smallholder farmers, testing a prototype prior to upscaling and commercialisation.

Title: Developing and adapting infield water-harvesting techniques

Locality: Thaba Nchu, Free State Province

Mix of stakeholders: University researchers, ARC, Water Research Commission, smallholder farmers

Description: In this initiative, funded by the Water Research Commission (WRC) and implemented by the Agricultural Research Council (ARC) and the Free State Department of Agriculture, smallholder farmers became active partners in the process of developing water harvesting technologies. They adapted the techniques for use with vegetables instead of just field crops, and adapted the specific technologies used to gather and store water.

Title: Developing a winter-feed supplementation option.

Locality: Impendle in KwaZulu-Natal

Mix of stakeholders: Smallholder farmers, Government research (on-station and off-station teams)

Description: Researchers with the KZN Department of Agriculture, Environmental Affairs and Rural Development worked with a farmer to find a way to improve the intake of chopped maize stover that he fed to his cattle in winter. This led to the development of a low-cost option for locally available winter-feed supplementation. Livestock owners in Msinga and the

non-governmental organisation (NGO) that supports them are now testing this option as a mechanism for creating agribusiness opportunities for youth as well as improving livestock productivity.

Title: Development of a suite of agri-businesses

Locality: Mahonisi Village in Limpopo Province

Mix of stakeholders: Unemployed youths, extension officer, local supermarkets

Description: In this innovation process, which was initiated and facilitated by an extension officer that had been part of a training programme, a group of 12 unemployed youths formed a cooperative and established a suite of agri-businesses. Concerned with their lack of jobs, the group sought support from the local extension officer from Limpopo Department of Agriculture, to start a small egg-production project, supplying local markets. This evolved into a multi-enterprise cooperative supplying four big supermarkets.

Title: Use of local knowledge in developing a mosquito repellent

Location: Giyani in Limpopo Province.

Mix of stakeholders: Traditional healers, CSIR researchers, SA National Parks staff, Department of Science and Technology (funders)

Description: The traditional healers in the Giyani area have always used some indigenous plants for different purposes. Through a self-organized traditional healers' committee, they formed a partnership with researchers from Council for Scientific and Industrial Research (CSIR) to develop and commercialise a mosquito repellent made from an indigenous plant that has properties similar to citronella. This initiative was funded by the Department of Science and Technology and has yielded positive results. The product was marketed through Kruger Park tourist outlets because Malaria is a problem.

Title: Farmer-extension-research joint learning for development of a biopesticide

Location: Diphaghane Village in Limpopo province

Mix of stakeholders: Smallholder farmers, Extension, Researchers

Description: The vegetable project farmers in the Diphagane village (Limpopo Province) could not afford the expensive chemicals, and therefore tried out a combination of plants to develop their own recipes for pest control (biopesticides). Building on farmers' knowledge,

the local extension officer in collaboration with the Researchers from LDA established a joint learning process. The aim was to conduct formal experiments to test the performance of this biopesticide on different crops, and develop a market for it.

Title: Bulk buying of agricultural inputs with savings.

Locality: Okhahlamba District in KwaZulu-Natal

Mix of stakeholders: smallholder farmers, NGO, University outreach

Description: Smallholder farmers in Okhahlamba District of KwaZulu-Natal (KZN), who have been members of a farmers forum supported by Farmer Support Group (FSG) from University of KwaZulu-Natal are also members of savings and credit groups set up by the NGO SaveAct. FSG and SAveACt are partners implementing the FAIR (Farmer Access to Innovation Resources) project, which has been piloting farmer-managed funds to support local innovation processes. They have strongly supported innovativeness in the community as a mechanism for addressing challenges.

5 ANALYSIS OF THE SELECTED CASES IN THE INVENTORY

A cross analysis of the 11 cases in the inventory was undertaken to build a better understanding of innovation processes in the field of agriculture in South Africa.

5.1 Location and scale

The scale of the innovation processes has varied from those very locally-based (such as the local chick mash in Msinga) to those that have been upscaled internationally, as with the wetting front detector, which has been marketed as far afield as Australia. This is likely to be due to the fact that one of the partners was the CSIRO, which is an Australian research organisation. In terms of the scale of the eleven cases documented, besides the wetting front detector case, 8 were restricted to a single locality while 2 covered more than one province.

To some extent local innovation processes are seen to be more focused on developing locally appropriate solutions and are therefore unlikely to be upscaled substantially unless there are other ideas that have similar resources available as well as facing similar challenges.

The innovation processes identified covered a number of provinces, but most were from KZN (4) and Limpopo (5), while one case, the infield rainwater harvesting case, was from

Thaba Nchu in the Free State and the last case, the wetting front detector, covered four provinces – including Limpopo Province. It was tested with farmers at a number of different locations. The focus on KZN and Limpopo is likely to be because these are the areas where members of the coordinating team happened to be working, or had worked in the past. It should not thus be assumed that these areas have a higher incidence of innovation processes than other provinces. The focus on working with existing networks and contacts restricted the identification of a wider range of, possibly more suitable, cases across South Africa but was a result of the limited resources available and the assumption that cases would be identified more easily than proved to be the case. It is also possible that most development programmes and research aimed at supporting smallholder farmers is not aligned with what Jolisaa was seeking, in particular multi-stakeholder innovation processes where smallholder farmers have played an active role as contributors of knowledge and ideas. This is likely to be because there has been a focus on commercialising smallholder agriculture and finding ways to downscale commercial practices.

5.2 Description of the innovations as outcomes of the process

The innovation processes were characterised in terms of which was the main innovation. It was found that when considering the main type of innovation, most were technical – these seem to be easier to see and are also the focus of many stakeholders. Far fewer organisational and institutional cases were identified. Nine of the 11 had some aspect of technical innovation, while six can be considered innovation bundles (a combination of different types of innovations (See Table 3). Examples of bundles of three different types of innovations were the maize seed production system and the *Lippia* mosquito repellent candles case. In both cases, there was technical innovation combined with new organisational structures / institutional arrangements that allowed access to new knowledge and markets and new approaches being used by organisations (institutional innovations) such as the MOU that was drawn up between the CSIR and the traditional healers to allow for benefit sharing.

Similarly the Diphagane case involved not only the development of the biopesticide (a technical innovation) but also a new institutional arrangement for stakeholders to engage. Similarly the process of developing the wetting front detector also involved a new way for researchers to engage with farmers to test and improve the technical innovation (Seen as an institutional innovation).

Table 3: Types of innovation processes

Types of innovations	No
Technical only	3
Organisational only	2
Bundles – technical and institutional	2
Bundles – technical and organisational	2
Bundles – technical, organisational and institutional	2
Total	11

When considering scale and types of innovations, it was found that the greatest number of cases identified were locally restricted cases involving a combination of innovations (See Table 4).

Table 4: Relationship between scale and type of innovation

Scale	Technical innovations	Organisational innovations	Innovation bundle (including technical as well as institutional and/or organisational)
Local	2	2	4
Regional	1		1
International			1
Total	3	2	6

The innovation processes were also described in terms of what part of the value chain they were linked to. This was referred to as the nature of the innovation. It was found that while many of the cases involved combinations of innovations associated with different aspects of the value chain.

It was clear that in most cases, there was at least some association with primary agricultural production, although this was frequently combined with innovations related to market access or processing.

Table 3: Nature of the innovation bundles

Nature of the innovations	No
Agricultural production only	1
Agricultural production and service delivery/logistics	2
Agricultural production and marketing	4
Agricultural production and processing	2
Processing and marketing	1
Agricultural production and natural resource management	1
Total	11

The cases that only involve agricultural production are fairly limited – in this case it was the case of development of a winter feed supplement. The ultimate lack of the success of the initiative might have been due to the fact that it did not consider an innovation that allowed access to the commercial inputs. The bulk buying case from KwaZulu-Natal was an example of a case where the innovation was related to the development of a savings-based system that facilitated access to agricultural inputs for production and assisted with the logistics of delivering them.

The most common combination was that of agricultural production and marketing. Examples were the cherry pepper case from Okhahlamba – where the farmers tried out a new crop and entered into a marketing arrangement with a neighbouring commercial farmer; the youth cooperative from Limpopo that involved production and marketing of goods. The Lippia candle case, on the other hand, involved processing the Lippia and marketing the candles.

If one considers both the type and nature of the **main** innovation processes encountered then one finds that the cases related to agricultural production and processing are predominantly technical types of innovations. Those related to service delivery and logistics as well as marketing are non-technical (organisational or institutional).

Table 4: Comparing nature and type of the main innovation

	Technical	Oganisational	Institutional
Agricultural production	6	2	
Service delivery/logistics		1	
Market Access		1	
Processing	1		
Total	7	4	0

From Table 4 it is clear that the most common combinations are technical innovations in the field of agricultural production. It should be noted that this table only considers the main innovation. Examples of these would be the wetting front detector, the chick mash and the winter feed supplement.

Institutional and organisational innovations are often less visible and are mainly identified when they occur in conjunction with a technical innovation (for example the soil fertility management case, where the farmer experimentation is visible, but is accompanied by innovative self-organisation of the farmers that has allowed them to access inputs), but one case was identified that has been characterised as an organisation innovation only. This is the bulk buying case from KwaZulu-Natal, where farmers have used savings to be able to buy agricultural inputs. This innovation has addressed technical challenges facing crop

production by smallholders. It could be characterised as an innovation in the field of service delivery/logistics related to agricultural production.

5.3 Dynamics of the innovation process

5.3.1 Main triggers

It was found that there were normally combinations of a number of different triggers that give rise to innovation processes. Environmental stresses (such as poor soils, erratic rainfall or insect damage) were the main trigger in 6 cases, but they featured in a total of 7 cases. The introduction of new technology triggered innovation processes in a total of 9 cases, although it was only viewed as the main trigger in only 1 case. This highlights that the introduction of new technologies, if carefully facilitated can lead to innovation processes as smallholders adapt the technologies to suit their local circumstances. Market changes/opportunities were triggers in 4 cases. Policy change (or a policy-related opportunity) triggered one innovation process, namely the egg production cooperative. The extension officer was aware that government was supporting cooperatives and used this as an entry point to initiate a youth project. In addition, the high unemployment levels amongst the youth triggered the innovation process as the extension officer sought a mechanism to address it.

Environmental stress together with introduction of a new technology was the most common combination of triggers. It is understandable that if outsiders introduced a technology that farmers thought had the potential to address a challenge, this would lead to an innovation process to adapt it to better suit the local conditions. Examples of this are the infield rainwater harvesting case from Thaba Nchu as well as the soil fertility management case in Limpopo.

With the cherry pepper case, it was a marketing opportunity that gave rise to the innovation process. The farmers were seeking a cash crop with a ready market and the neighbouring commercial farmer's association with a processing facility provided this. Market opportunities have been triggers in a number of other cases too – with the *Lippia* candles, the demand for interventions to prevent malaria provided a market opportunity. Similarly, with the maize seed production system, which responded to a need for high quality, locally adapted seed.

Table 5: Triggers that give rise to innovation processes

Combinations of triggers	No
Environmental stress and New technology	5
Environmental stress and Market opportunity	1
Market opportunity and New technology	2
New technology, Environmental stress and Market opportunity	1
Policy change, New technology and Other (high rates of unemployment)	1
Market change and Other (high transport costs)	1
Total	11

5.3.2 *Origin of innovation processes*

While triggers give rise to innovation processes, it is useful to explore who has initiated the process and how the stakeholders have interacted. All but one of the cases were seen as organised partnerships. This was probably because they were innovations that emerged from projects or programmes. They were termed partnerships because through some fairly structured process, different stakeholders came together to develop a new technology or system. Most were also found to have been planned (8) rather than unplanned /spontaneous processes (3). This is because the innovations one is aware of are mainly those associated with projects and programmes – the spontaneous cases are less visible. It was hoped that more cases of spontaneous innovation would be identified through this process, but it proved difficult to locate them. Spontaneous innovation processes might be the result of unplanned interaction of stakeholders in response to a real challenge.

The opposite of these truly multi-stakeholder innovation processes would be more conventional technology development and transfer processes or cases considered to be of a top-down nature. Organised partnerships are those where the stakeholders are partners rather than technology developers and technology adopters.

In terms of the origins of the innovation processes, 4 were farmer-led, 4 were said to be development initiatives and 3 were researcher-led. Development initiatives were those driven by extension officials and NGOs (for example the Youth Co-op case in Limpopo and chick mash innovation from Msinga) that aim to improve rural livelihoods through income generation and/or improved household food security.

The innovation processes initiated by farmers included the development of the winter supplement, the development of the biopesticide in Limpopo, the testing of the new cash crop and the development of the *Lippia* mosquito repellent candles, which was actually led by traditional healers rather than farmers. In all cases, the farmers either identified a

problem that needed to be addressed, and were seeking assistance in solving it, or they saw an opportunity to address a challenge or make use of an opportunity. In the case of the winter supplementation, the farmer involved approached a departmental official for assistance with addressing the challenge and the latter introduced an idea (a new technology) about how to overcome the problem, which in this case was the inefficient utilisation of maize stover by cattle.

Some innovation processes are initiated by researchers who, through their experience of working with farmers, identify possible solutions for addressing challenges that they see affecting farmers. This was the case for the wetting front detector, where researchers were aware that many irrigation farmers are characterised by inefficient use of water – especially smallholder farmers. The researchers sought to develop a simple tool that would assist farmers to know when and how much water to apply. These researcher-led innovation processes have started on-station or in the laboratory before being investigated during an on-farm or joint experimentation process. For example, the wetting front detector was developed by researchers before being introduced to farmers to test.

5.3.3 *Links to projects*

A number of the cases have links to projects aimed specifically at supporting innovation processes – for example the strong institutional context established through the FAIR project gave rise both the cherry pepper case and the bulk buying case. The Water Research omissiomm (WRC) research programme has also given rise to a number of innovations, namely the wetting front detector and the infield rainwater harvesting technologies. The BASED programme in Limpopo province, which supported and encouraged participatory processes also gave rise to a number of innovation cases reflected in the inventory, namely the soil fertility management case, the egg cooperative case and the maize seed production case. The *Lippia* mosquito repellent candle-making case emerged because of the nature of the programmes supported by Department of Science and Technology (DST) and CSIR – as well as due to the social responsibility work of SA National Parks (SANPARKS).

Another aspect that emerged during the assessment of the cases was that of when the innovation process actually started (termed T_0). It was sometimes difficult to distinguish between the project-related 'context' that gave rise to the innovation and the actual innovation process itself. This was the case with BASED project in particular, where focal areas were identified early, during the course of the project (possibly termed the context), that then gave rise to innovation processes.

5.3.4 Associated activities

A wide range of activities have formed part of, been associated with, or have contributed to the innovation process (See Table 6).

Table 6: Range of activities associated with innovation processes

Activities said to be essential or significant	No. of cases activity is associated with
Diagnosis or thematic studies	5
On-station research	4
On-farm research	8
Exchange visits	8
Training and capacity building	10
User focus groups	9
Platforms or new institutions established	7
Support services developed	6
Other: Farmer experimentation	2

From the table above, it can be seen that **Training and capacity building** has been widely associated with innovation processes (10 cases). This is sometimes directly related to making use of the innovation itself, while in other cases it is part of creating an enabling environment. For example, the bulk buying case required that farmers received training in operating savings and credit groups, while with cooperative case, the members had to learn how to run a cooperative effectively as well as how to manage the different agro-enterprises such as the layer production unit. This was also the case for the soil fertility management case in Limpopo where firstly it was extension officers that were capacitated and later the farmers were also involved in capacity building activities.

The need for **platforms that facilitate sharing and discussion** is highlighted by the extent to which user focus groups, exchange visits and the establishment of platforms and new institutions was mentioned. These are also mechanisms that can stimulate innovativeness by exposing people to new ideas. For example the Sibusimpilo Farmers Forum, established through the FAIR project, stimulated innovativeness and facilitated sharing between farmers, which played a key role in the development of the bulk buying system as well as the decision to test the cherry peppers as a new cash crop.

On-farm experimentation (generally managed and led by researchers) and farmer experimentation (led and undertaken by farmers) are key to innovation related to agriculture. From the cases included in the inventory there is little evidence to suggest that **on-station research** supports or contributes to innovation processes except where it has been linked to

on-farm research (this is research undertaken by researchers with farmers on their fields) – as was the case with the wetting front detector.

5.4 Innovation process dynamics and current status

The innovation processes captured in the inventory range from those which have reached the point of being commercialised and upscaled (i.e. the wetting front detector) to those that are still at a fairly early stage of development (e.g. the bulk buying case). The winter feed supplementation case is one that did not move beyond joint experimentation for various reasons.

With some cases it proved difficult to determine the current status of the innovation systems. Documentation covers the process up to a certain point (for example 2008 in the case of the *Lippia* mosquito repellent candles). It proved difficult to ascertain the current status of the project and it is well recognised that many innovation processes that rely on marketing of the products encounter serious challenges in the long-term unless they have a strategically skilled partner on board.

Most of the cases captured showed some level of success (e.g. the infield rainwater harvesting case is seen as highly successful as has the cherry pepper case) although a number were included that are perceived as failures or at least problematic as they provide useful lessons (See Table 7). For example, the winter supplement case cannot be described as a successful innovation process because it did not lead to the adoption of the technology that was developed and tested through the on-farm joint experimentation process. The innovation process could have been strengthened by greater discussion with the farmers to understand what factors would limit the uptake of the technology.

Table 7: Summary of success rates of innovation processes

Success of the process	No.
mostly seen as a success story	7
some consider it a success, others not	2
mostly seen as a problematic case or a failure	1
Unknown	1
Total	11

Success was generally measured in terms of the outcome of the innovation process. If the process developed a useful innovation that was adopted and upscaled or taken forward to the commercialisation stage (where appropriate), then it was said to be successful. If an innovation process did not achieve this output then it was said to be problematic or a failure.

Generally, the mechanism for choosing cases may have biased the findings in terms of success rates as people generally want to share their successes rather than their failures. The problematic winter supplement case seen was one that a member of the coordinating team had been involved with which was probably the reason that this case was put forward.

5.5 Stakeholders and their contributions

Stakeholders involved in the innovation processes documented in the inventory were very varied. They included individual smallholder farmers in all 11 cases (leaders or co-leaders in 4 cases), CBOs or farmers organisations (such as the cooperative in Limpopo and the farmers' forum in KZN) in 10 cases (a leader or co-leader in 2 cases), extension officials in 7 cases (leaders or co-leaders in 2 cases), formal research from government or universities in 7 cases (leaders or co-leaders in 6 cases), NGOs in 5 cases (leaders or co-leaders in 3 cases) and private sector in 6 cases (leaders or co-leaders in two cases – the wetting front detector and the cherry pepper cash crop case).

Private sector players have really only been involved actively in innovation processes that have a commercialisation aspect (e.g. Lippia candles or development of the wetting front detector). Some of the cases identified had no real opportunity for commercialisation but have the potential to improve livelihoods of resource-poor farming households (for example the local chick mash developed in Msinga). These are the types of cases supported by NGOs that have a focus on improving livelihoods.

WRC played a role as a funder in two cases, while FSG and Centre for Rural Community Empowerment (CRCE) at University of Limpopo were university outreach arms that played roles in two innovation processes.

5.5.1 Knowledge sources

Since the focus of the study was on multi-stakeholder innovation processes, it was not surprising to find that most cases (8) drew on mixed sources of knowledge (local knowledge of farmers and external knowledge of extensionists, researchers, the private sector and NGOs), while 3 of the cases mainly relied on external knowledge (the cherry pepper case from Potshini in KZN, the infield rainwater harvesting from Limpopo and the egg layer cooperative), but even these involved local knowledge and experience in the adaptation and application of the innovations.

Some examples of local knowledge encountered in developing the inventory included an understanding of local farming systems and implications for when share-outs of savings had

to take place (from the bulk buying case), indigenous knowledge (of plants to use in biopesticide recipe and method of processing *Lippia* to produce a mosquito repellent).

In some cases, farmers have taken introduced knowledge and ideas and have adapted them to local conditions. This was the case with the chick mash, where a specialist introduced the idea of feeding eggs to chickens during winter and the farmers decided to use old unhatched eggs rather than wasting good eggs.

Other cases showed that external stakeholders had knowledge about growing crops (for example the commercial farmer in the cherry pepper cash crop innovation), processing (CSIR and the *Lippia* mosquito repellent case), financial literacy (SaveAct and the bulk buying case) and enterprise development skills (extension officer in the cooperative case from Limpopo).

5.5.2 Roles of stakeholders

The role of the different stakeholders in the innovation process was explored (See Table 8).

Table 8: level of participation of stakeholders in the innovation process

Role in process / Stakeholder	Individual farmers	CBOs / FOs	Public Extension services	Formal Research	NGOs	Govt. (Municipality)	Private sector	Other
Co-leader or leader	4	2	2	6	2		2	
Active participant	7	7	4	1		1	3	4
Minor participant		1	1		2	3	2	
Not a participant		1	4	4	7	7	4	

It was found that **individual smallholder farmers** had the leader/co-leader role in 4 cases. This included the winter supplement innovation process, where the farmer approached research staff for assistance with solving the problem. Another such case was the chick supplement from Msinga, where farmers actively experimented with an idea introduced to them, adapting to local conditions. In the *Lippia* mosquito repellent case, it was the traditional healers association - categorised here as a Community based organisations (CBOs) or farmers organisations (FOs) - that led the innovation process, while in the biopesticide case, it was the farmers' group that developed the recipe and sought a market for their product.

In addition individual smallholder farmers were active participants in 7 cases. This is to be expected as the cases were all selected based on being multi-stakeholder processes with relevance to smallholders.

In 2 of the cases **NGOs** were listed as co-leaders or leaders (Mdukatshani Rural Development Trust in the chick supplement innovation from Msinga and SaveAct in the bulk buying case) while **formal research** was said to be a leader or co-leader in 6 cases (university researchers as well as provincial government and the national research institutes – ARC and CSIR) and an active participant in a further case. There were only 4 cases where formal research was not involved at all. This highlights the fact that innovation processes that are most easy to identify are those associated with formal research institutions.

The **private sector** was said to be a leader or co-leader in 2 of the cases (commercial farmer in the cherry pepper case and the manufacturing firm in the wetting front detector case) and was found to be an active participant in a further 3 cases. While **Extension** was seen as a co-leader or leader in 2 cases (the cooperative case and the maize breeding case from Limpopo), they were seen as an active participant in 4 of the cases while not participating at all in 4 cases. **Government (Municipality)** never played a role as a leader or co-leader and was only mentioned in cases where extension officials from Department of Agriculture are seconded to the local Municipality.

5.6 Benefits

The parties benefiting were either the initial innovators themselves and those who might have already (or in future) adopt that technology or society at large (See Table 9). Examples of cases where the innovators and/or adopters were beneficiaries, which were the majority, include the youth cooperative from Limpopo mainly benefited its members and the development of the chick mash, which mainly benefited the farmers and other adopters.

Innovations that benefit society at large are those that can have a positive impact on the natural environment (e.g. the development of a biopesticide which reduces the use of chemicals) or which produce a product that other people use (e.g. the locally bred maize seed as well as the biopesticide made available for sale).

Table 9: Beneficiaries of the innovation process

Who mainly benefits from the innovation?	No.
mostly initial innovators themselves, and/or subsequent "adopters"	9
stakeholders and society at large (including the environment)	2
Total	11

6 DISCUSSION

While the inventory phase did not yield a wide range of cases of innovation processes, it did produce a diverse set of cases that demonstrate that multi-stakeholder processes do led to the development of new technologies (such as the maize seed), practices (such as infield rainwater harvesting) and tools (such as the wetting front detector) as well as new institutions (such as the MOU to allow for benefit sharing between traditional authorities and the CSIR) and new organisational arrangements (such as the bulk buying system).

It is also clear that innovation occurs along the value chain, right from where inputs are sourced through to where products are processed and/or marketed.

The cases reflect the diversity of stakeholders involved in innovation processes and the wide range of knowledge contributions and skills that they are able to contribute to the process – from technical skills to processing and marketing skills. It becomes clear that innovation processes often require a number of different innovations to develop concurrently – often institutional innovations being required for the adoption and upscaling of technical innovations.

The cases reflect the innovativeness of different stakeholders in finding mechanisms to address the challenges that smallholder farmers face in producing and marketing their produce. It illustrates the need to recognise and encourage innovativeness as a mechanism for strengthening the sector and allowing smallholders to increase the contribution that agriculture makes to income generation and food security.

The inventory could be useful as a database that others who are also interested in multi-stakeholder innovation processes could make use of. It would however have to be highlighted that at this point is by no means an exhaustive compilation of cases. It proved difficult not only to identify cases, but in some cases intellectual property issues were encountered where case holders were not willing or permitted to make the information available to the Jolisaa project. This highlights the need to make people realise that a project of this nature has the potential to benefit the sector rather than just those organisations directly involved.

Another challenges that was experienced when identifying suitable cases of innovation to include in the inventory, was to distinguish between projects that involve a range of stakeholders and innovation processes where a number of different stakeholders have come together to contribute knowledge and ideas that have allowed for the development of an

innovation. Some cases that were initially included in the inventory proved to be projects rather than examples of innovation processes. While there were innovative approaches demonstrated in the projects, and even some innovation processes, the team was not able to identify cases that were truly in line with Jolisaa's objectives. In some cases, 'projects' were being called 'organisational innovations' or 'innovation bundles'. From this experience it is clear that there is not a general recognition of the role that local knowledge can play in contributing to innovation processes. It became clear that technical cases were much easier to identify. Many projects involved the implementation of ideas developed by one set of stakeholders, which often involved a number of different stakeholders, and were focused on improving smallholder production. Despite this they could not be termed multi-stakeholder innovation processes.

The eleven cases explored through the inventory have provided an initial understanding of how innovation processes involving multiple stakeholders have unfolded in South Africa. The cases have improved our understanding of the triggers that give rise to innovations, the nature of the partnerships and the types of activities that are frequently associated with innovation processes, such as capacity building and farmer experimentation.

The ideas that have emerged through this synthesis will be explored in more detail through the collaborative case assessment process that focuses more closely on three cases of innovation processes selected from the inventory. The collaborative assessment will be undertaken by a team that includes local stakeholders. Through engagements with the different stakeholders involved in the unfolding of the innovation process, an understanding of how best to encourage and support innovation processes will be sought.

7 REFERENCES

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APPENDIX 1 LIST OF PEOPLE CONTACTED IN IDENTIFYING INNOVATION CASES

Organisation	Individual
Agricultural Research Council	Hendrik Smith, Cobus Botha, Felix Reinders, Chris Stimie, Yolisa Pakela Jezile, Aart-Jan Verschoor, Michael Kidson, Adri Theron
Indigo Development and Change	Bettina Koelle
Limpopo Department of Agriculture	Gerrit Rootman, Joe Ramaru, Jeff Mkari
Farmer Support Group, University of KwaZulu-Natal	Maxwell Mudhara
Mpumalanga Department of Agriculture, Rural Development and land Administration	Sipho Maphosa
Donkey Power	Peta Jones
Mdukatshani Rural Development Programme	Rauri Alcock
Save Act	Anton Krone
National Wool Growers Association	Leon de Beer
Scientific Roets	Merida Smuts
CSIR	Martinis Horrok, Sunshine Blouw, Graham von Maltitz
CP Wild	Manager
Bryanston organic Market	Konrad Hauptfleisch
South African Sugar Association	Abraham Singels
Water Research Commission	Gerhard Backeberg, Andre Sanewe
Elsenburg Agricultural College	Dirk Troskie
KZN Department of Agriculture	Victor Roberts, Hannes de Villiers, Thiambi Netshiluvhi
Optimal Agriculture Business Solutions	Daan Louw
Rhodes University	Susi Vetter
<i>Via Susi Vetter</i>	Sarah Freeze
University of South Africa	Prof Jana Olivier
Future Works	Miles Mander
University of KwaZulu-Natal	Sheryl Hendriks, Albert Modi, Mark Laing, Monique Salomon
McCains	Ineke Vorster
Department of Science and Technology	Carol van Wyk, Thiambi Netshiluvhi, Eric Watkinson
Department of Rural Development and Land Reform	Daphne Mayindi, Remina Rashopola
Tshwane University of Technology	Lindile Ndabeni, Rasigan Maharaj
National Research Foundation	Carolyn Palmer, Candice Steele, Tracy Klarenbeek
National Department of Agriculture, Forestry and Fisheries	R Tuckeldoe, Peter Ramolotja
Human Sciences Research Council	Tim Hart
Rainman Foundation	Raymon Auerbach
University of Limpopo	Ernest letsoalo
University of Fort Hare	Patrick Masika
University of Free State	Aldo Stroebel

APPENDIX 2: LIST OF 39 CASES ORIGINALLY IDENTIFIED, 24 DOCUMENTED AND 11 FINALLY INCLUDED IN THE INVENTORY

CASES AND CASE-HOLDER / CONTACT ORGANISATIONS		CASES INITIALLY DOCUMENTED IN INVENTORY	REASONS FOR NOT SELECTING CASES INITIALLY FOR THE INVENTORY	REASONS FOR EXCLUDING CASES FROM FINAL INVENTORY
1	Eco-technologies – ARC		It was not possible to address concerns regarding intellectual property.	Already excluded
2	Heiveld rooibos – Indigo Development and Change		This was being documented by the case holders as part of a PhD study.	Already excluded
3	Housing for household chickens – LDA	Yes		Insufficient information and concern that it was a project rather than an innovation process.
4	Communal rangeland research – LDA	Yes		Research with farmers rather than an innovation process.
5	Cherry peppers – FSG, UKZN	Yes		Included
6	Donkey harnesses – Donkey Power	Yes		Insufficient contribution of local knowledge and insufficient stakeholders.
7	Hoisted poultry cages – Donkey power	Yes		Not a multi-stakeholder innovation process.
8	Chicken laying baskets and stands – Mpumalanga Department of Agriculture		The process was too early to document.	Already excluded
9	Drum irrigation - Mpumalanga Department of Agriculture	Yes		Still too early in the process.
10	Chicken mash – Mdukatshani Rural Development Trust	Yes		Included
11	Sustainable harvesting of termites - Mdukatshani Rural Development Trust	Yes		Insufficient local knowledge contribution.
12	Biopesticides – LDA	Yes		Included
13	Savings & Credit scheme – Save Act	Yes		Decided to view it as context for bulk buying case.

CASES AND CASE-HOLDER / CONTACT ORGANISATIONS		CASES INITIALLY DOCUMENTED IN INVENTORY	REASONS FOR NOT SELECTING CASES INITIALLY FOR THE INVENTORY	REASONS FOR EXCLUDING CASES FROM FINAL INVENTORY
14	Bulk buying - SaveAct	Yes		Included
15	Small-scale wool support system – National Wool Growers Association	Yes		Excluded because a development project rather than an innovation process and insufficient contribution of local knowledge to the development of the innovation.
16	Kwaxolo chicken project – Scientific Roets	Yes		Development project rather than innovation process and insufficient local knowledge contribution
17	Lippia javannica case – CSIR	Yes		Included
18	Marula – CP Wild	Yes		Insufficient information.
19	Indigenous silk moth – CSIR		Insufficient information and insufficient local knowledge component.	Already excluded
20	Cashmere case – CSIR		Insufficient local knowledge component and innovation had not emerged.	Already excluded
21	Participatory Guarantee System – Bryanston Market	Yes		No contribution of smallholders' knowledge to the development of the systems
22	Smallscale irrigation – South African Sugar Association	Yes		Insufficient contribution of local knowledge to the innovation process.
23	Wetting front detector – University of Pretoria	Yes		Included
24	Tredde pump – ARC		Insufficient smallholder knowledge contribution to innovation process.	Already excluded
25	Rain water harvesting – ARC	Yes		Included

CASES AND CASE-HOLDER / CONTACT ORGANISATIONS		CASES INITIALLY DOCUMENTED IN INVENTORY	REASONS FOR NOT SELECTING CASES INITIALLY FOR THE INVENTORY	REASONS FOR EXCLUDING CASES FROM FINAL INVENTORY
26	Cover crops – KZN Department of Agriculture		Insufficient local knowledge contribution to innovation process.	Already excluded
27	Marketing of deciduous fruit - Optimal Agriculture Business Solutions		Insufficient local knowledge contribution to innovation process.	Already excluded
28	Marketing madumbies – University of KwaZulu-Natal	Yes		Insufficient local knowledge contribution to the marketing process – limited to primary production.
29	Grazing systems – Rhodes University		Discussions did not lead to identification of suitable case.	Already excluded
30	Drip irrigation – ARC		Insufficient local knowledge contribution to innovation process.	Already excluded
31	Water net – UNISA		Insufficient local knowledge contribution to innovation process.	Already excluded
32	Marketing indigenous medicinal plants – Future Works		Consultation did not identify suitable case where local knowledge played a role.	Already excluded
33	Food security – UKZN		No suitable innovation process identified.	Already excluded
34	Farmer-led documentation – Prolinnova		Proved to be an innovative method rather than an innovation process.	Already excluded
35	Method of winter supplementation – KZN Department of Agriculture	Yes		Included
36	Apple grafting method – Human Sciences Research Council	Yes		Only two stakeholders.
37	Nguni cattle project – University of Fort Hare	Yes		Project rather than any examples of innovation

CASES AND CASE-HOLDER / CONTACT ORGANISATIONS		CASES INITIALLY DOCUMENTED IN INVENTORY	REASONS FOR NOT SELECTING CASES INITIALLY FOR THE INVENTORY	REASONS FOR EXCLUDING CASES FROM FINAL INVENTORY
				processes within the project.
38	Fort Hare Dairy Trust – Amadlelo – University of Fort hare	Yes		Business approach rather than an innovation process.
	<i>Cases identified later in the process</i>			
39	Egg Layer cooperative - LDA	Yes		Included
40	Development of maize seed – LDA	Yes		Included
41	Soil fertility management – LDA	Yes		Included

APPENDIX 3: QUESTIONNAIRE SENT TO WORKSHOP PARTICIPANTS

The cases of multi-stakeholder innovation that you select to present at the workshop should meet most of the following criteria (please indicate):	
Criteria	Yes/No
A process that has led to the development of an innovation that increases income, reduces labour, increases production, improves livelihoods and/or improves management of natural resources	
An innovation that is relevant to or specifically focused on smallholders	
The innovation process involves at least 3 types of stakeholders	
Local knowledge plays a role in the innovation process (<i>a 'nice to have'</i>)	
The case has been underway for some time (several years)	
The innovation process is mature, i.e. there is already an outcome (even though the process may be continuing)	
The innovation is technical, social or organisational in nature	

If you would like to participate in the meeting, please prepare a 1-page summary for each innovation case that covers the following aspects:

1. Location
2. Background
3. Field(s) of innovation (e.g. livestock-keeping, cropping, forestry, water management, savings and credit, land tenure, marketing, etc)
4. Types of stakeholders involved
5. Role of the smallholder farmers in the process, including gender issues
6. Party responsible for initiating/leading/driving the process
7. Factors / catalysts responsible for development of the innovation
8. The outcome(s) of the innovation process
9. The benefits of the innovation and for whom (including relevance of gender)
10. The role of local knowledge in the innovation process