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Making innovation systems work in practice: experiences in integrating innovation, social learning and knowledge in innovation platforms

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This article presents a different dimension of the innovation systems approach, going beyond analysis and shedding light on how these processes can be facilitated in practice. This is based on 20 years' experience with innovations systems. The focus is on the role of facilitation in triggering the changes, as well as in integrating learning and knowledge management (KM) in the innovation process.

Introduction

The agricultural innovation systems (AIS) approach is increasingly being promoted as a framework for understanding the complexity of pattern of interactions among different stakeholders in agricultural research and technology development processes (Engel 1997; Clark 2002; World Bank 2006; Hall *et al*. 2006; Spielman *et al*. 2008; Klerkx and Leeuwis 2009; Ngwenya *an*d Hagmann 2009). Spielman (2005) argues that the theoretical innovation systems literature provides a framework for the analysis of complex relationships and innovative processes that occur among multiple agents, social and economic institutions, and endogenously determine technological and institutional opportunities. In many instances, the AIS framework is used to either understand the dynamic of innovation (see Essegbey 2009) and the linkages and feedback between the main actors around the value chain (see Kibwika *et al.* 2009). It is also used to analyse the impact of policies on innovations (see Lynam and Theus 2009), or even understanding institutions and practices that govern interaction, learning and knowledge sharing among actors (see Hall and Dijkman 2006). Very little attention is given to the mechanism that triggers changes in the pattern of interaction. The role of knowledge management in the innovation process is not adequately addressed either.

Analysis helps in understanding which linkages exists, who is involved in what processes and who is excluded, which markets are dysfunctional, which actors are weak, and who needs to be strengthened and so on. Our argument is that using an innovation system approach as a framework for analysis is not enough. The innovation systems approach needs to be translated into an operational tool: how to help markets function better, how to strengthen the capacity of the weaker actors and how to create the linkages in practice.

This article presents a different dimension on innovation systems approach that goes beyond just analysing and understanding the system, shedding light on how a process that

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modifies the pattern of interactions among different actors in a given system can be triggered in practice through facilitation for change. It is based on the systematisation and conceptualisation of lessons over 20 years of our own experience in trying out different ways of make innovation systems work in different context and levels within the broader agricultural system.

The structure of the article is as follows. First, we share the evolution of our thinking and practice on innovation systems and knowledge management, and our definitions of the two. We describe a conceptual framework for operationalising innovation systems and the knowledge embedded in it. Lessons from practice demonstrate how this can be done in practice. Lastly, we draw some lessons on the role of facilitation in these processes and some conclusions.

The evolution of our thinking and practice on innovation systems and knowledge

In the 1990s, the second author and another colleague worked together in a conservation tillage project for sustainable crop production in Zimbabwe. Our mandate was to develop and test on-farm some conservation agricultural technologies in three districts. Despite our strong technical background, we quickly realised that with a technology focus and a transfer of technology approach would never lead to an improvement of the livelihoods, nor would we enable farmers to solve their problems and develop opportunities and innovations in other areas of technology. Without knowing about innovation systems or knowledge management, and with little exposure to participatory approaches, we engaged in a learning process with farmers to develop innovative technologies and approaches.

We adapted our approach iteratively and expanded our interventions (Hagmann *et al.* 1997). We intuitively engaged in a long-term action research process, trying out things, observing what happens, discovering certain things, and sharing our observations and defining the next steps continuously. It was this strong vision and orientation towards the ultimate impact, and the confidence to try out, which brought us to develop a farmer based learning and systemic approach that integrates social organisation and technical innovation. We realised that innovation is a social process and that impact can only be achieved if one finds a way to fully embed an innovation process in the social organisational setting of farmers' communities. All these required technical, social and institutional innovation at the same time.

Through this action learning mode, we discovered how the system works and what needs to be done to support it to change from inside. Facilitating effective local organisational development and local governance to enable innovation were central in addition to technological innovation development. So we developed the tools, methods and approaches and systematised them into a learning approach to extension called the Participatory Extension Approach (PEA) (see Hagmann *et al.* 1998, p. 9; Ngwenya 2002a, 2002b; Ficarelli *et al*. 2003; Ramaru *et al*. 2009, Ngwenya and Hagmann 2009).

In 1998, we expanded to South Africa's Limpopo Province. Again we engaged in an action learning process, to adapt and further develop the Zimbabwean approach to suit the South African context and iteratively developing new insights and ideas on how to make the innovation system function effectively. Since 2001, this approach was further developed and implemented successfully in the Dominican Republic, Tanzania and since 2006 also in Cambodia. The main assumption of this approach is that the spreading of innovations depends on the interaction between rural people and their social organisations, and that neither technical nor social innovation on its own makes a

substantial impact (Hagmann *et al*. 1999). Some of the main objectives of this approach are to:

- Facilitate a process of self-organisation and community emancipation to enable people to better articulate and represent their quality demands for a specific service, and to be able to claim accountability from the service providers. This involved strengthening the weaker links to give them a voice in the value chain.
- Develop and spread technical and social innovations in a process of joint learning which builds the local knowledge of rural people. The aim is to move the farmers from the weaker position of recipient in the technology and knowledge generation process, where they are expected to just adopt what has been generated by the 'experts', to a stronger position as creators of knowledge. This has implications for knowledge management.
- Link rural people and organisations to different actors along the value chain, influenced by a drive to fulfil articulated demands. Smallholder farmers gain more power leading to new dynamics of how the actors interact in the value chain

The innovation system approach and knowledge

Based on our practical experiences, we understand the innovation system approach to be a systemic intervention to make a system work, where different actors and functions are coming together for an overall purpose of addressing certain innovation challenges, technically, socially or otherwise. This can be at local level, medium level or high level. The core is trying to make a system where innovation and knowledge can flow, and it is driven by the commitment of the different actors working together in concerted, collective action.

In our opinion, knowledge management (KM) is a continuous process of using knowledge more effectively to reach the desired impact and goals. It consists of five components that are interconnected and interrelated at the conceptual level. These are information management; learning-oriented monitoring and evaluation (M and E); communication; innovation; and learning and adaptation. The linkage between the innovation system and knowledge is that knowledge is the fuel required to make the systems work. The knowledge in such processes is being developed or sourced elsewhere as innovation. Or systems are made to work in a different way.

The key to unlock the potential is the interaction between actors, involving negotiation of interest and changing the patterns of interaction. Dialogue or communication between the actors is what can be achieved with facilitation. Ultimately, the purpose of both innovation and knowledge management is to make the interaction work and the knowledge to flow so that the system can actually learn from itself.

Embedding knowledge management in social organisational and technical innovation processes at farmer level

It is evident that asymmetries among actors and the application of an AIS approach through rural development activities that emphasize commercialisation may benefit some actors unequally or excludes others (Rajalahti *et al*. 2008). It is also apparent that many agricultural systems are not functioning well due to factors that include poor articulation of demands for services (World Bank 2006; Klerkx and Leeuwis 2009); lack of clear benefits for the actors; and weak linkages between actors (see Essegbey 2009). Smallholder

farmers undoubtedly remain the weakest link in agricultural innovation systems and value chains. There is therefore, a growing recognition of the need to strengthen these actors in order to improve the function of the innovation system (see World Bank 2006; Hagmann *et al*. 1999).

Local organisations play an important role in agricultural and rural development (see Esman and Uphoff 1984; Nuijten 1992; Hagmann *et al*. 1998; Nepal 2009). Therefore, local organisational development (LOD) and change is seen as the backbone in the implementation of PEA. This means strengthening the capacity of individuals, groups and the community to self-organise in order to better articulate their demands for services and become strong players in the innovation system. An 'organised demand' considers the differentiation of needs and demands of the various clients/social strata. It tries to be inclusive so that equal opportunities for different groups of people prevail and relevant services can be provided to the more marginalised as well. The quality of the demand is an important element. High quality demand is built on a deep analysis of the causes underpinning the problems or issues. It relies on a thorough exposure to and assessment of options, in order to address the issues and the understanding of what service providers can contribute. In contrasts with the shallow 'wish lists' of needs and wants that are often found in community plans, service demand can only be responded to in a cost-effective manner if a critical mass of people shares the same problem and demand.

Organising the demand side is very critical. However, the system can only function well when there is a balance between the demand and supply, and where there is a conducive environment in which this interface occurs. In Zimbabwe for example, the entry point was at farmer level where we worked, and linking the farmers directly to individual service providers. The local extension officers got involved and were trained to support the farmers. In terms of knowledge management and learning, there were efforts made to link the local level and the higher level of extension management. There was organisational change management and capacity development at the management level to trigger policy change, all these driven by demand. There was constant interaction between the different levels, in that there where events organized where farmers gave feedback to the extension officers but also to the district and provincial levels. These levels began to learn to play their roles together in order to make that whole system work (see Hagmann 1999; Hagmann *et al*. 1999).

When implementing in South Africa from 1998, it was recognised that there was a need to reach the critical mass that enables farmer to have more bargaining power, and that could not be achieved by linking individual farmers to the service providers, as was the case in Zimbabwe. With our limited capacity we could not reach this critical mass either, as we could only implement in two or three villages. We therefore, strategically, started by developing the capacity of extension officers as an entry point. This training was designed as short reflective cycles that combine both theory and practice. And this enabled simultaneously implement in the communities. Details on this competence development process are elaborated in Ngwenya (forthcoming).

A conceptual framework (Figure 1) shows a learning cycle with some operational steps that guide the implementation of the process in the communities. This is not a blueprint, but it is continuously adapted to suit different context, while maintaining the core values that drive the process. This learning cycle comprises of six components, which build upon each other. These are: initiating change; searching for new ways; planning and strengthening local organisational capacity; experimenting while implementing action; sharing of experience; and reflecting on lessons learnt and re-planning.

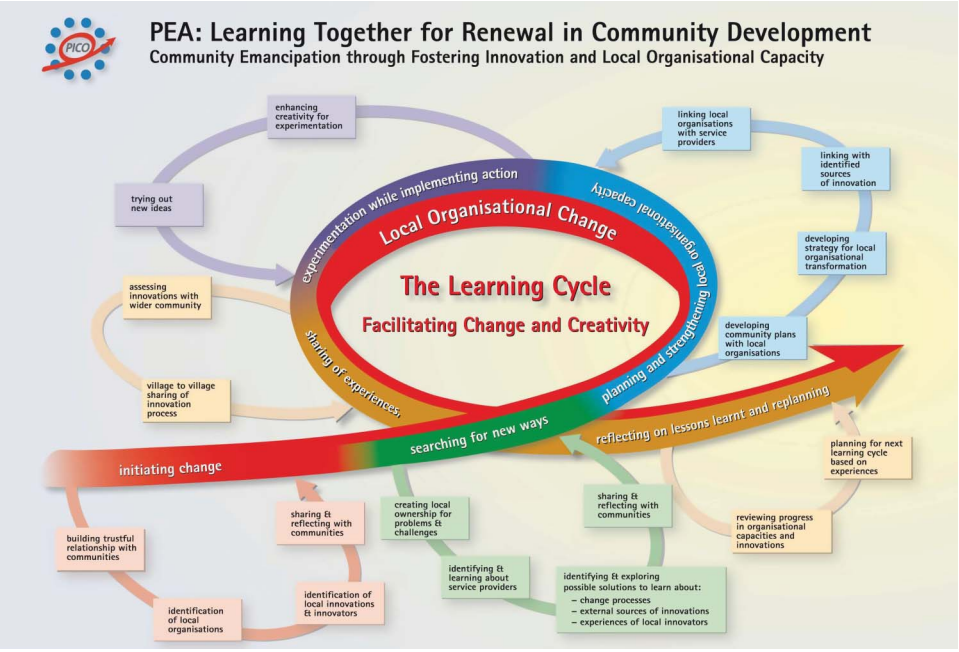

Figure 1. The farmer based Innovation learning cycle.
Based on experience in Zimbabwe, South Africa and Dominican Republic (www.picoteam.org).

In the learning cycle (Figure 1), KM is embedded in the entire process. In step 1 (initiating change) for example, among other actions is the identification of local innovation and innovators. Rural people try out and innovate in their little corners, based on their indigenous knowledge. Many of them do not share their knowledge and they seldom participate in collective activities. In one of the villages, there was a woman farmer who had been practicing goal zero grazing for many years. No one knew about it, not even the local extension officer who had worked in the village for more than eight years, because the woman hid the goats in her kitchen and did not share her ideas because of fear of being labelled a witch. It was through the process of deliberately identifying local innovators that this woman and many other innovators were discovered and recognised as knowledge generators, and were given the necessary support. This created a safe environment where innovators could share their knowledge with the rest of the communities.

This process of identifying and supporting local innovations and innovators is a very important part of KM because only knowledge that is known can be managed. This was a basis for creating strategic linkages with different actors who could support the knowledge base.

As reflected in Figure 1, following each step, sharing and reflecting with the community is done consciously and it is embedded in the entire process. At this stage, sharing is done at interest group level as well as community level. Step 4 (experimentation while implementing action) is at the core of knowledge generation where the extension officers, the researchers and the farmers engage in a joint process of analysing and trying out different options, generating new ideas and sharing and reflecting together, with farmers taking the centre stage. Anything that is tried out is as a response to what the farmers themselves have identified as challenges. This follows a facilitated process of strengthening their

articulation of 'quality' demands. Farmers become the key generators of knowledge while the extension and researchers play the support role. The farmers willingly mobilised their own resources for experimentation purpose. Facilitating a process that gets the farmers to do this (mobilise their own resources) is a major achievement in a country where dependency on government support and aid is rife. Putting the farmers at the centre of knowledge generation means that the researchers and extension officers have to shed their power and give space to the farmers. Changing this pattern on interaction requires a major shift in the attitude and behaviour of all; and this was achieved through facilitation for change.

Steps 5 (sharing of experiences) and 6 (reflecting on lessons learnt and re-planning) also indicate the special attention given to sharing and reflecting of experiences and lesson. At this level, sharing and learning happens among groups, at village level, across the villages, at district level, at provincial level and beyond. Different events for sharing are organised, where the farmers systematically share their experiences, reflect and analyse the processes they have gone through, and draw some lessons for the future.

This process resulted in changes in the way the farmers are organised, changes in attitudes and behaviour, altered linkages with different service providers, change in the patterns of interaction in the knowledge generation process where farmers are at the centre, the learning, sharing and reflection. All these could not be happen with analysis only, but requires another level that triggers these processes. In this case it was through facilitation for change.

Innovation as service delivery system

The South African experience quickly brought us to the insight that we need a strong pluralism in service providers and sources of innovations. While working with farmers in a similar way, the demand from farmers for good services became very strong due to the PEA engagement and the service providers responded with their old way of doing business. We then saw a need to engage much more with other service providers apart from extension (e.g. NGOs, private sector, etc.) and enable them to play their roles together to provide services which support farmers. All the required actors were not operating as a functioning innovation system at all and we then realised that we were simply dealing with 'system/institution failure' rather than technology or innovation failure. The components of that system were all operating in isolation and in disregard of the whole system performance. Blaming others who do not do their work and therefore 'I am failing and cannot do anything except focusing on my little contribution' was the main attitude. So, we started to 'platform' and 'web' service providers around key areas (seeds, soil fertility and water management, livestock, etc.).

That was the emergence of the service delivery framework, where three levels of simultaneous interventions are required to develop a rural/extension service system (Hagmann *et al*. 2002). We started to understand service and innovation systems systemic change and negotiation process within and across three levels of demand and supply, which are articulated in figure below.

Organising the demand side

As shown in the previous section, this step encompasses the strengthening of local organisational capacities at community, inter-community and district level. What is critical is the articulation of demand towards service providers, where the communities are well organised using powerful strategies and mechanisms to influence service providers and

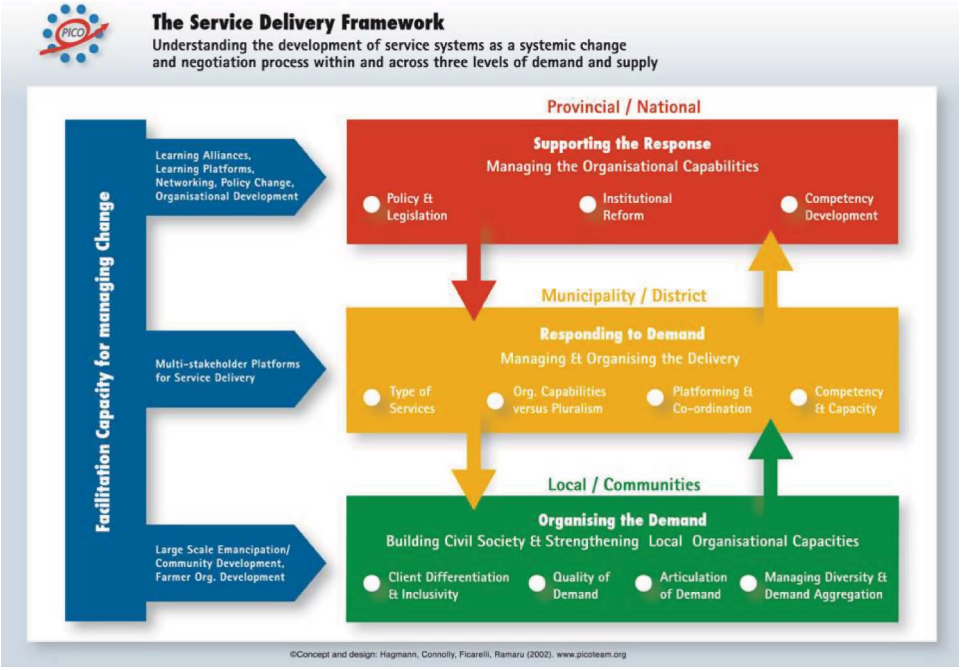

Figure 2. The service delivery framework Source: Hagmann et al, 2002 (www.picoteam.org)

assure the accountability of providers to the clients. Representation and the organisational capacity of local organisations are critical here. Experience with public service providers has shown that without effective articulation, it is unlikely that service providers will respond to specific requirements – instead they will tend to remain at the 'goodwill' level of individual extension agents.

Managing and organising the service delivery/supply side

This describes the level of the service providers. Here the delivery of services is managed and organised to respond adequately to the articulated service demand. The demand is from communities, but demands from policy-makers and other levels can be equally important. Service providers learn to interpret the demand and identify the type of services, which is appropriate for the various clients' support. The aim is to create a pluralistic environment, where there are a number of potential service providers to be contracted. The performance of the providers and the quality of their services were assessed, in order to identify who can best do the job.

These services providers are then linked with the farmers along the platforms of the innovation system or market/value chains thus 'making the system work as a system'. The roles and mandates of service providers are clarified and, more importantly, they begin to 'learn to play the roles' and work together in synergistic ways towards making a difference. This is a big challenge, in particular in a highly competitive environment where every provider want to get the credit for themselves. It requires high-level facilitation that opens up the space to negotiate interest, clarify the benefit, and a sound competence development and information management system to give equal opportunities to the various providers.

Managing the organisational capabilities of service providers and policy levels

Policies and legislation regulating service provision modes and arrangements as well as finance of services need to be enabling for service providers to perform optimally. Large public service provider organisations (e.g. extension departments, research, health, etc.) require systems and processes that will allow their field agents and decentralised structures to perform the tasks in an accountable way. Performance management aspects, such as continuous adaptations in the organisational structure, culture, systems and processes, help make the 'support for the response' effective and efficient. Institutional reform processes are seen as on-going adaptations propelled by learning from experiences in the field and changes in the environment, rather than massive one-off events which often do not change the ultimate mode of delivery much. It is about creating learning organisations to manage this ongoing change. Competence development and institutional change is therefore a central aspect in reaching organisational capacity. This is not perceived as conventional training; it is learning integrally incorporated into the organisational development process.

In our intervention, the three levels are considered as one system. Experience from the past decades has shown that a sole focus on service providers (the supply side) does not lead to demand-oriented sustainable services. The demand side (rural populations) needs to be supported in organising themselves and maintaining a formalised voice in the service system. On the other side, governance of services needs to match with the requirements (finance, mandate, policy). Any 'forgotten' aspect in the service system can turn out to be a blockage hindering the success of the overall intervention.

Until recently mainstream thinking was often based on ill-formulated, state-controlled policies with poorly developed support for implementation. At the provider level, in extension for example, supply-driven production packages were promoted, while at the demand level rather shallow needs assessments were often carried out in the past decade to make the system appear 'participatory' and responsive. The overall effectiveness and efficiency, however, remained poor.

Some key lessons

The key lessons drawn here relate to how to trigger change, how to integrate knowledge management and the role of facilitation.

Triggering change that is required: an approach to develop innovation platforms

A key lesson emerging from our experiences is that ultimately we are dealing with systemic bottlenecks in the institutional arrangements when dealing with innovation systems. One of the critical challenges is that the demand for innovation is low and so the driver, which could push the delivery systems, is weak. Supply-driven approaches to innovation have a long and not very successful history, mostly because the demand was low. The main strategy is thus to enhance demand for innovation when one tries to make the innovation systems work better.

There are two ways of enhancing demand: the first one is through excellent innovations, which then perpetuate delivery systems, which work. The cell phone would be a good example. The other way is through making the system work by dealing with the inherent systemic bottlenecks. Once these have been dealt in a systemic way and the system gains dynamism, it automatically asks for more innovations as a fuel for the whole system. This then will create demand for research and invention.

In our experience of the agricultural sector in Africa, we have come to the conclusion that even brilliant innovations have little chance if they are being put into dysfunctional systems. Therefore, the strategy here is to work with the systems to improve them better so that the receptivity and demand is emerging strongly. The approach to develop innovation platforms as demonstrated in the three cases presented above responds to this strategy and tries to come up with new institutional arrangements, which can create the necessary dynamism.

Building on the lessons from Zimbabwe, South Africa, Ethiopia, Tanzania and Malawi over the past ten years, the operational approach to develop innovation platforms can be systematized into key steps, each with detailed activities, methods and processes. They are not necessarily strictly in sequence, but generally one would follow the broad sequence:

Steps towards establishing the innovation platforms, partnerships and business models

(1) *Define a problem or opportunity with a high potential for impact*
It is critical is to have a good understanding of opportunities and problems which have a high impact potential. The success of the maize seed production system in Limpopo Province, South Africa, serves a good example.

(2) *Formulate an innovation challenge which defines clearly the scope and focus of the platform*
This sets the boundary of the envisaged delivery/innovation system and allows focus on all the functions on making that specific system work as a system.

(3) *Identify the functions required to make the system work as a system*
For specific innovation processes, flexible and dynamic innovation networks, partnerships are formed from the network of actors (Klerkx *et al*. 2009) who collaborate in a given system. However, purpose and the process underlying these networks has an influence in their performance. Most importantly, the clarity in terms of who should do what.

Once the scope/system boundary is defined, the functions required to make the system work are then analysed through an in-depth functional analysis. This presents a shift from the common practice in partnerships development where actors are identified first, they come together and then decide on what they need to achieve together. This way of forming partnership – starting by identifying partners – does not take into consideration the principle of 'the form follow function', where what needs to be done determines who can strategically make a significant contribute to ensure that the a particular function is adequately addressed.

In the draught power platform case for example, the second circle in the diagram reflects the functions identified which need to be in place for the system to work effectively. Many of them are not necessarily a stumbling block at a moment and need interventions, but they are required as part of the system and this need to be analysed if they are functioning effectively.

(4) *Identify the actors who can best deliver these functions effectively and efficiently.*
This is a two stage process. In the first step, a broader brainstorm of possible and known actors for each function is carried out with a group of stakeholders who can also validate the innovation challenge and the functions. As a second step, these

organisations are analysed in the field in view to their past delivery and successes, their challenges and their ability to deliver. This actor mapping opens up the search for new partners beyond the usual choices.

(5) *Invite the promising actors for a first meeting and analyse systemic blockages and first actions.* In the first platform meeting, the actors analyse the systemic bottlenecks for delivery (e.g. why is it not happening without any intervention) their mutual expectations and contributions required to make the system work. They then identify the priority issues to deal with speedily to start the operations. The broad strategies are identified and an initial exploration of the business model is done. The workshop normally ends with an action plan to work on improving relationships and the mutually required deliverables so that things can get into motion.

(6) *Development of a compelling business model creating the incentives of the system to work.* Building on the workshop outputs, business model is developed, which can excite all the parties as it helps them see their own benefits from a functioning system. The draught power example indicates the scope of such a model. The business model should really be a serious intervention model, which is able to trigger the system to move to a higher level and to generate sustainable income/benefits for all. This business model is developed with the key stakeholders and engages substantial external expert knowledge.

(7) *An assessment of systemic capacity and each individual actor's capacity* is undertaken and capacity development measures are identified to strengthen the core actors' capacity. Often some functions with actors are the bottlenecks for the whole system. For example, in the fish platform in Malawi the production of fingerlings was the main bottleneck. An analysis of this domain and the capacities will provide the intervention points to bring this component up to speed to deliver. This might be major investment areas.

(8) *A first action plan is drawn up to start operating as a platform towards delivery.* Together with the outputs of the workshop and the deeper analysis afterwards, a first business/work plan of the platform is consolidated.

(9) *Review action, performance and analysis in regular intervals.* After some initial experiences in working together, the action plan and the previous analysis is reviewed, the functions, roles, relationships are refined. It is important to see the roles as evolving with an increasing experience of what can work and what not. Tightening the roles and functions and responsibilities too early is counterproductive as the modus operandi needs to be clarified first. The whole institutional arrangement is facilitated towards setting rules of the game and ways to channel money into the setting with high standards of accountability to the success.

(10) *Coaching.* Coaching support is required to continuously assess and enhance the performance of the platform actors, including regular self-assessment to enhance the platforms performance. The actions continue in a learning and action research mode, with regular learning sessions and continuous improvement processes until the system is running on its own successfully.

Most critical to sustainability is the business model on which the partnership on the innovation platform is built. This business model is certainly adapted over time to ensure that all partners are really benefiting in ways that make their own delivery more effective and efficient.

Integrating KM in the innovation process

There is a growing recognition of the importance of knowledge sharing as a means of ensuring cross-fertilisation of ideas, information and knowledge, which is one of the mechanisms of knowledge management within organisations (see Szulanski 2000; Roth 2003 Ashkenas *et al*. 1998). Knowledge management is evident at the approach development level. Looking at the where this approach was started in Zimbabwe, major lessons were drawn and conceptualised into this approach. When implementing in South Africa, this approach was not taken as a blueprint, but was further developed through an action learning process leading to the platform development. In Malawi, Tanzania and Ethiopia, the approach takes different shape as it is further developed to suite the different contexts. This is made possible through the high level of learning, reflection and management of knowledge that is generated along the way.

In all cases presented here, KM is not seen as a separate activity but rather fully embedded in the processes. As argued before, KM is seen in the broader context that includes sharing of information, learning oriented M *an*d E, communication, innovation and learning/adaptation. With the farmer based learning this integration comes out clearly. The farmers are no longer seen as recipients of information but play an active role as co-generators of knowledge. This is in line with the call to move away from the historical roots of adoption and diffusion of innovations as advocated by many, including Leeuwis and van den Ban (2004).

(1) *The catalytic role of facilitation for change in innovation platform development*. We have argued that using innovation system approach as a framework for analysis is not enough; what is missing is another level that makes things work. These experiences show that the development of a functioning platform requires high quality facilitation – particularly during the first one to two years until the system's own procedures are fully developed. The facilitation required is far much more than workshop facilitation and managing group dynamics. It is the facilitation for change for personal entrepreneurship and institutional development as described in the Ethiopia case and it requires a lot of technical and business expertise too in order to guide the development of the platforms. Facilitation for change is a process of using strategic techniques and tools that act as a catalyst for unblocking certain patterns and modifying existing patterns of interactions of the different actors, or activating new ones (where there is none) towards achieving a certain goal. This means challenging actors to de-learn certain ways of doing things and embrace certain values that are required to make the system work.

(2) *Creating discomfort and breaking silo*. Coordinated services require different institutional arrangements that are flexible and performances based, rather than traditional institutions. Our experience was that many organisations think in terms of their mandates, and as such they do not take joint responsibility for the systems failure. They often pass the buck to the others – researchers saying we have done our research; it is extension officers who are not disseminating. The officers pass the buck to farmers who do not want to adopt and so on. Knowing that the failure is caused by someone else make people stay in their comfort zones. Through facilitation, this pattern is brought out in the open, and actors are challenged to think in terms 'systems failure' and their role in it. In this case, they begin to position themselves in terms of what they contribute in respond to what is required for the system to work, rather that their mandates. It is about creating freedom and space

to deliver in a none bureaucratic way backed up by higher level support and mutual accountability of actors.

(3) *Broadening the knowledge generation base*. Changing the landscape of innovation generation is core to the facilitation for change. This means creating a system where all actors have an equal opportunity to contribute their knowledge and experiences in the innovation development process. Farmers for example become legitimate sources of knowledge, rather than just recipient. This requires a 180 degrees change of attitude of actors and the way of form of institutional arrangement.

(4) *Creating a business model with a compelling vision and clear benefits for actors*. Functioning innovation system requires a business approach with clear gains and benefits for the different actors. However, not everyone has this understanding. The role of facilitation is, therefore, to create awareness and understanding of innovation system approach to the different actors. The energy for commitment and playing the expected role emerge from a compelling collective goal and targets as well as their commitment to success. As an example, an analogue of an Africa funeral (Textbox 1) has been useful in this regard. Our observation is people always relate with it. It often generates a lot of energy and raises many questions with regards to how much potential people have in terms of organisational capacity.

(5) *Strengthening the weakest link through self-organisation*. Self-organisation may increase opportunities for innovation when self-organising initiatives are properly facilitated to create and us***e*** windows of opportunity (Klerkx *et al*. 2010). Developing the self-organisational capacity of weakest link is very critical.

Textbox: The African funeral mode of organising

We ask stakeholders a question: 'Who of you has ever seen an African funeral fail?' The response is often, it never fails, no matter what happens, or how poor people can be; the body has to be buried. We then explore with them why it does not fail. The principles emerge as:

- The functions to be performed are clear.
- There are clear responsibilities (everybody knows exactly what do and when to do it, e.g. the priest, food preparers, the grave diggers, undertakers, the mourners, etc.)
- There is total commitment by all (all these people assume their duties without being pushed by anybody)
- Self interest - realisation of 'what is in it for me' - Some people do this because they want the same support when it happens to them.
- Deploying of experience (those who are experienced in certain services, do their best, e.g. not everybody is a grave digger).
- Fear of shame and fear of negative consequences (people fear that if they do not support, they might also not get the support when this happens to them)
- Presence/emergence of champions for every department: a person or people (either appointed or self appointed) who oversees that everything goes well in that areas/.
- Peer pressure (people hold each other accountable if something is not done, or if someone is lagging behind

(6) *Stimulating creativity, solution-orientation and entrepreneurial spirit*. Often a problem-focused development approach often becomes a blockage in itself. A 'problem' is often seen as a stumbling block, with very little that one can do to overcome it. This blocks the people thinking capacity and reduces their positive energy to engage. The facilitation for change here focuses more on stimulating peoples' thinking in a solution-based manner. This encourages people to see challenges ('How to . . . '). Instead of finding reasons why things cannot work, people are encouraged to see opportunities to make things work. It is this 'Problems feed opportunities' attitude that makes people more creative and entrepreneurial by trying out alternative solutions. As people's capacity to systematically try out and analyse things develops more and more in the process, they also require a space for try out and to explore different ways of dealing with the challenges.

(7) *Managing inclusiveness, participation and engagement of actors.* Realistically not all the actors can participate in the process at the same time. Key to facilitation is the ability to coordinate these different actors and knowing whom to strategically bring in, at what stage of the process, while keeping the momentum of the other actors who are not involved at that moment. Managing the inclusiveness means providing space for innovators and entrepreneurs to emerge and perform while maintaining the support of and providing opportunities for the communities members. It is about managing the balance between inclusiveness and performance. Keeping the interest and commitment of the other actors alive is achieved by strategically engaging them through feedback and sharing.

Conclusions

The operational perspective of an innovation system approach offers opportunities for bringing different levels of the systems together to function effectively as a system. The innovation platforms as highlighted in this paper show that all the different levels are required to enhance an innovation system: the farmer level self organisation and capacity to innovate and manage collective action; the service providers focus and the platforms which brings these actors together to perform on agreed issues. All these require a clear integration domain around a common compelling goal and establishing mutual accountability for success and failure among actors.

Managing participation of actors is an important aspect. It is not about involving everybody at the same time; it is about involving the right or relevant people, at the right time for the right work and creates a benefit by making the whole system work. This is what we call a targeted business model approach, and it requires drastic change in the way of thinking, the attitude and the behaviour of the different actors. Most importantly; there were new institutional arrangement and new ways of doing business. The different actors need to learn to play the new roles together, and this needs high level of action learning, reflection and adaptation along the way. Therefore, KM needs to be integrated in the process of social learning and innovation.

In our experience we have learnt that just analysing the system cannot trigger these changes. Neither can these changes occur by themselves. There is a need for another level that triggers the change in the pattern of interaction. Noting that innovation systems are context specific, with different innovation challenges, involving different actors at different level, there is therefore no blueprint or single strategy on how to do it. There is a need for high level of flexibility that allows continuous adaptation along the process. Klerkx

et al. (2009) call this the 'innovation broker'. For Abate *et al*. (2011 forthcoming) this is a 'software' to make the players play together, negotiate their roles and holding each other accountable for delivering their respective parts in the right time and quality. We call it facilitation for change. With this thinking and our experience, we argue that a facilitator for such processes needs to posses many more than skills that of chairing meetings and managing group dynamics. A facilitator needs to be a step ahead in terms of understanding the innovation systems, and the value chains around a particular system in order to be able to ask the right questions, that challenge actors to acquire new perspectives.

Making innovation system work in practice means catalysing an action that changes patterns of interactions among different actors, towards the functioning of a given system. It is about identifying systemic blockages within a system, and use them as a trigger to influence change in the whole system. Facilitation for change derives its strength from the use of codes and tools that have a psychological effect. An African funeral for example, has an ability to generate debate and create enough urgency to start thinking and doing things differently. In order maximise the benefit of such tools, the facilitator need to strategically know when and how to use them, and have broader picture and see the connectedness of issues to be able to ask questions and probe towards the right direction.

This article has demonstrated some effective methodologies to facilitate change in the developing innovation system. However, these are still isolated cases and the learning in within individuals and small entities. We do not see a large-scale learning yet on how to make innovation systems really work. Many actors are experimenting at local and national levels, but if all these interesting lessons should come together and really help to improve things at scale, we require a much more effective learning from each other and knowledge management at the broader level. Unfortunately some of the operational knowledge in facilitating such interventions is more tacit knowledge that explicit. It needs different ways to create this knowledge in people that through papers and reports.

Notes on contributors

Both authors (**Hlamalani Ngwenya** and **Jürgen Hagmann**) are part of an international organisation called PICOTEAM mainly facilitating organisational and institutional change processes, systemic competence development processes and action research in the broader agricultural development continuum, and beyond. This paper is based on their own practical experience. They would like to acknowledge the reviewers for their valuable comment on the earlier version of this paper, as well as the editors for editing work leading to this final version.

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