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Dynamizing development processes through livestock innovation system research

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Introduction

Forty years ago, the International Livestock Centre for Africa (ILCA) was a pioneer in livestock systems research – research designed to take account of the complexity of real farming systems so as to be able to contribute to development. Systems research had its ups and downs over the years but, gradually, a growing number of researchers and donors of international agricultural research have come to recognise that systems research is vital for development impact. Here, we look at how ILCA's Livestock Systems Research (LSR) evolved in the 1970s and 1980s and its further development in the form of innovation-systems work in ILRI since the turn of the century.

The beginnings of systems research

The taskforce led by Derek Tribe in 1972 put ILCA on the systems path. It stated that ILCA's most important function was to integrate sociological, economic and biological research and development related to livestock in Africa. The new centre should therefore study existing livestock systems to understand why the people do what they do (ILCA 1994). In those early years, social scientists – anthropologists, sociologists and economists – played a key role and made up about 30% of ILCA researchers. Their work included examining the responses of traditional systems to development interventions, seen as “unique experiments which can never be reproduced in the confines of a research station” (*ibid.*). Scientists worked together with livestock-keepers, testing potential improvements to see what worked and how the local people adapted the ideas using their own knowledge and experience. Thus, an early form of research for development in smallholders' reality – indeed, research in development – was born in ILCA in the 1970s.

It was a new approach that needed to mature. At that time, it was more multi- than interdisciplinary, and the focus was on production with only small forays into processing and marketing – such as developing a butter churner in Ethiopia and my own studies of milk processing and marketing by Fulani women in Nigeria – all very much on the margins of ILCA's work. Some technical scientists and many social scientists recognised local creativity and innovation, e.g. they observed how livestock-keepers used the “fodderbanks” in ways the scientists had not foreseen. The core work, however, was about scientist-led development of technologies that could fit into the existing livestock systems and be scaled out. Biological and technical aspects were at the fore; sociopolitical and institutional aspects received less attention. Nevertheless, this work contributed to development of the farming systems research approach, which eventually led into the current innovation-systems work.

It also produced outputs relevant for development. ILCA scientists explained the rationale behind many traditional practices, such as keeping low-demand indigenous animal breeds. Studies of water requirements of different classes of stock in different systems (King 1983) showed that many local grazing and watering practices suited the drylands. ILCA's field research revealed what interventions might be worthwhile or not, e.g. gains from feeding supplements to calves up to weaning were hardly visible after three years. The research provided evidence to re-orient development work.

ILCA developed systems research methodology for understanding and improving livestock systems. It compiled a manual for livestock systems research and trained African and European scientists in this approach, and held workshops and conferences on livestock systems research. It also developed methodology for monitoring the impact of livestock development projects, although this was focused mainly on production and seldom looked at wider, longer-term impacts on poor people's livelihoods.

In addition, reviews of the years suggested that the livestock systems work:

- made international and national decision-makers more aware of the intricacies of livestock production in tropical Africa and the value of a systems approach to research and development
- provided key contextual information on livestock systems in the different ecological zones where the multidisciplinary research teams were working
- produced overviews of specific aspects of livestock production that were not central to Western science but are to African livestock-keepers, such as about browse, small ruminants and camels
- increased the capability of researchers – also in national research institutes – to think in systems terms and to see more clearly what type of livestock research would have development impact.

ILCA publications were useful reference works not only for researchers but also for students and development practitioners. They were largely descriptive, compiling and analysing existing and new information, but also led to important development activities (e.g. Coppock 1994, Coppock *et al* 2011). At a time when universities and colleges in Africa were teaching out of Western textbooks and when national research centres were doing on-station work on “modern” livestock production, ILCA provided information on what by far the majority of the livestock-keepers in Africa were actually doing – an important starting point for any development intervention.

Veering off to a technology focus

Back then, ILCA faced a tough battle: taking a research approach embedded in the real world – under uncontrollable and unpredictable conditions – while its performance was being measured according to conventional scientific criteria based on a paradigm of linearity, simplification and disciplinarity. Indeed, initially, some technical scientists in ILCA’s multidisciplinary teams did not think much differently and were distressed at how smallholder reality ruined their carefully planned trials.

In the mid-1980s, the CGIAR Technical Advisory Committee (TAC) advised ILCA to do component research in animal health, nutrition and genetics. It regarded opportunities for technical intervention in drylands (e.g. pastoral systems) as “too little to warrant a major research effort”. The livestock systems work that did continue under the Systemwide Livestock Programme (SLP) focused on mixed crop-livestock farming and was mainly confined to analysing the systems according to economic criteria and energy efficiency rather than working with people in the systems and stimulating and analysing the dynamics of change. Thus, review by conventional scientists did not allow the more innovative, complex and challenging LSR approach to mature. The pressure of Science was in the direction of precise measurement rather than relevance and engaging with development. This was the time of commodity thrusts to increase outputs of milk, meat and traction, and a time when the social scientists – except economists – were removed from the multidisciplinary teams. By the end of the 1980s, ILCA had only one non-economist social scientist on staff (Romney & Minjauw 2006).

The ecoregional approach introduced into the CGIAR in the early 1990s could have reinforced a systems approach to research in ILCA, but then came the merger of ILCA and ILRAD (International Laboratory for Research on Animal Diseases), bringing together two organisations with very different cultures: ILRAD’s upstream research to produce technologies for downstream application and ILCA’s field-based applied research. The merger could thus be considered a setback for LSR in the combined centre called ILRI, established in 1994.

Nonetheless, some important work relevant for smallholder livestock development was done in the 1990s. The SLP drew attention to the importance of investing in mixed crop-livestock systems (Herrero *et al* 2010). ILRI characterised indigenous livestock breeds and looked at community management of farm animal genetic resources within a systems context of high disease pressure and high seasonal variation in fodder quantity and quality. It confirmed the value of local breeds that can survive and fulfil the multiple functions of livestock for farm families living in marginal areas.

ILRI continued to facilitate networks of people worldwide, with members in research institutes, universities, government agencies and NGOs in South and North – networks on forage, small ruminants, livestock policy, alley farming and feed resources, to name but a few. These helped inform development practitioners and scientists, also those outside the CGIAR. And there were always a few technical scientists and economists in ILRI who recognised that, to make a difference in development,

it is not enough to work on technologies and commodities and who kept in view the role of livestock in stabilising and sustaining poor peoples' livelihoods.

Renewed attention to development impact in innovation systems

Systems research in ILRI started to recover from the merger in 2002, when Carlos Sere became Director General. By this time, also the TAC (1999) had recognised the “virtual absence” of sociological research and encouraged its inclusion in the multidisciplinary teams, which is an essential aspect of livestock systems research. Like in the 1970s, in the 2000s, senior management strongly supported a systems approach – working directly with development partners and giving more attention to gender and other social issues. Emphasis on poverty reduction became more explicit: seeking to better understand the roles of livestock for poor people and how livestock can help them climb out of poverty, and identifying associated policy and institutional changes needed to support this process. Work started again in pastoralist areas, where potential for non-technical innovation was indeed recognised. A few more social scientists were brought back into the research teams.

ILRI's new theme Enabling Innovation (ILRI 2002) saw innovation as emerging from interaction between different actors contributing complementary knowledge and skills – and saw ILRI as one of the many contributors to the process. The Enabling Innovation team tried to enhance the adaptive capacity of farmers and researchers for solving problems “on the move” (Sere & Rege 2003) – in the midst of the dynamics of development.

This continued from 2007 in the crosscutting unit Innovation Works, which sought to link knowledge with action on the ground, helping ILRI researchers learn how to integrate research into development practice and to influence policy. The unit set up several multistakeholder learning platforms involving public and private research and development actors to create space for co-generating knowledge and inclusive decision-making for action. These platforms were also called “R4D platforms”, “learning alliances” or “innovation platforms”. Some were commodity-based along value chains; others dealt with natural resource management (NRM). Examples are: dairy platforms in Tanzania, Kenya and India to link local and national stakeholders; innovation platforms that included resource-poor goat-keepers in Mozambique; and inclusion of Maasai pastoralists in drawing up land-use plans in Kenya.

Such transdisciplinary approaches are now central in the CGIAR Research Programs (CRPs) in which ILRI works together with several international and national research and development partners. Based on its experience, ILRI is playing several roles in this:

- Developing and testing mechanisms for enhancing joint learning and action in livestock-related innovation to improve the livelihoods of poor people
- Contributing relevant scientific findings related to livestock to these innovation platforms in order to catalyse or help guide development action
- Engaging in place-based participatory research with livestock-keepers in ways that enhance their innovative capacities, clarify impact pathways and contribute to moving along these pathways
- Studying how the livestock-related innovation processes and systems function and how they can be enhanced, explaining what works and doesn't work and why in a systems context
- Developing, testing, improving and sharing methods for learning-oriented impact assessment, and building capacities to apply these methods within the partnerships
- Synthesising lessons from the experience for policymakers and engaging in policy dialogue so that realistic and feasible policies can be drawn up and implemented, based on research findings
- Convincing governments and international organisations to promote investment in livestock systems research aimed at poverty alleviation, food and nutrition security, and sustainable NRM
- Generating information and learning to empower women in livestock innovation systems.

To highlight two of these points:

- **Policy.** Already in the early 80s, ILRI set up a Policy Unit. It gave increasing attention to this over the decades, not only studying policy but also trying to influence policy to create an enabling environment for pro-poor livestock innovation. For example, ILRI's research on milk markets in Kenya revealed that most milk was sold through informal channels, especially by poorer producers to poorer consumers. The work evolved from research on milk production and public

health into research and influence on policy related to managing health risks in informal markets, so that poor producers – mainly women – could still earn an income and poor consumers could still afford to buy dairy products (Leksmono *et al* 2006, Kaitibie *et al* 2009).

- **Gender.** Already ILCA but even more so ILRI recognised the importance of gender. Working in existing farming systems, it could see that most resource-poor livestock-keepers are women. Women play major roles in caring also for animals owned by men and are largely responsible for processing and selling animal products from both mixed farming and pastoral systems. The Science Council (2009) noted that ILRI’s approach to gender inclusion was “uncommonly mature” compared to other CGIAR centres. Individuals within ILRI kept up the battle to raise gender awareness, provide gender-related evidence and include gender issues in research and development design (ILRI 2012, CGIAR Research Program on Livestock & Fish 2013).

According to recent studies, some results of the innovation-systems work of ILRI, in collaboration with numerous partners within the CGIAR and beyond, include:

- Improved communication and collaboration among multiple actors with different interests within livestock systems, leading to better access of smallholders, both men and women, to input and output markets, e.g. in integrated crop-livestock value chains in northern Ghana (Zewdie 2013)
- Helping stakeholders identify livestock-related research and development priorities focused on livestock species important for the poor and on the most severe constraints for resource-poor smallholders and consumers (Romney & Minjauw 2006)
- Enhanced capacity to assess constraints and opportunities and to innovate in forage husbandry in different ecological and institutional contexts (Puskur *et al* 2009)
- Policy influence related to food safety in milk and meat markets (SPIA 2008)
- Much greater awareness of gender issues in agriculture and rural development, not only livestock keeping, and of the impact of technologies and policies on women (Science Council 2009).

Conclusion and outlook

ILRI started with LSR and appropriate technology development within the systems, and then linked increasingly with other actors in innovation processes to learn how research could contribute better to development action. The impacts of this approach reach beyond livestock and forage production, processing and marketing to include change in gender relations and in relations among all stakeholders in animal agriculture, through strengthening local innovative capacities and influencing policy to favour pro-poor development.

Most CRPs in which ILRI is involved, such as Livestock & Fish; CCAFS; Drylands; Humidtropics; Water, Land & Ecosystems; and Agriculture for Nutrition & Health, are practising systems research and development and promoting the wider application of this approach. This is what could make a huge contribution to development in smallholder farming: scaling up transdisciplinary research in the midst of innovation systems so that a systems approach can be applied by more and more scientists – also in national research systems – with the full backing of their institutions.

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