Since the earliest days of development assistance, investments in agriculture through research and technology transfer have been central to rural development strategies. After falling from grace in the 1990s, a rush of new initiatives — and the World Bank’s 2008 World Development Report on “Agriculture for Development” — suggests that agriculture and agricultural science and technology are once again riding high in the development assistance world.

New this time round is the focus in many of these initiatives on innovation and the idea of innovation systems. What is driving this development, or is this just another passing fad? And what can be done to help this broad change in direction?

Since the earliest days of development assistance, investments in agriculture through research and technology transfer have been central to rural development strategies. After falling from grace in the 1990s, a rush of new initiatives — and the World Bank’s 2008 World Development Report on “Agriculture for Development” — suggests that agriculture and agricultural science and technology are once again riding high in the development assistance world.

New this time round is the focus in many of these initiatives on innovation and the idea of innovation systems. The shift in viewpoint that this signals is simple, but fundamental. If we are agree that development is about change, let’s worry less about the supply of new knowledge and technology from research and concentrate instead on the conditions needed to demand and use knowledge to bring about that change.

In the October edition of the LINK News Bulletin, we profiled just a few of the numerous new initiatives, many of them flagging their use of the innovation systems concept. Other initiatives, like the Innovation and Communication group at Wageningen Agricultural University, have been working with these ideas for many years. In the coming months LINK will profile some of these new as well as long established programmes.

Agricultural Science: A History of False Dichotomies

If one steps back from this new interest in agricultural innovation, it is possible to see this as part of a much longer history of arguments about how agricultural knowledge should be used for development. For example, recent research at LINK on the evolution of the International Agricultural Research Centres finds that scientists have been arguing about this issue since the start of international agricultural research activities in the 1960s.

Points of contention include: Should plant breeding be conducted in on-station trials or in farmer fields? Should research be organised around commodities or around eco-regions? Should it take the form of traditional research, farming systems research or farmer participatory research? Is farmer knowledge superior to scientific knowledge? Should technology be modern or intermediate? What types of research lie in the public domain and what in the private? What constitutes international public good research and what is locally-relevant applied research and development?

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For every convincing narrative of one position, there is an equally convincing counter-narrative: High yielding cereal revolutionised food production in Asia, but failed in Africa. Privatisation of seed supply systems improves client orientation in India, but not in Bangladesh. Participatory plant breeding is improving process in natural resource management in West Africa and investigates ways of creating opportunities for innovation in this field for more sustainable resource use. Michelle will work under the guidance of UNU-INRA’s Prof. Karl Harmsen and LINK coordinator Andy Hall. Michelle also holds a BA in Political Science and Comparative Ethnic Studies from Barnard College, Columbia University in New York, USA.

Instead, different positions on the organisation of agricultural science and innovation tend to be discussed in a highly polarised fashion. This has resulted in a series of false dichotomies of the sort mentioned above. And, of course, where dichotomies exist, contending positions emerge and those with larger or more politically powerful coalitions of interest usually steer policy towards one approach at the expense of another.

This has unfortunate consequences for agricultural science and innovation policymaking. It means that the diversity of agricultural innovation experiences — because of their context-specificity — never allows for the formation of a sufficiently coherent or powerful coalition of interest to influence policy and institutional change. At best, one sees many small groups of practitioners and researchers rallying around different innovation experiences, behaving competitively and often waging bitter turf wars instead of expending their energies collectively to bring about policy change. With limited policy and institutional change, diversity is also stifled because routine ways of organising science and innovation become entrenched and incontestable.

Despite this polarisation, one can, however, see a number of common themes emerging. These include: The complementarities of knowledge from different sources, or at least the acknowledgment of their existence; the desirability of client or user inputs in technology design; governance measures to manage specific needs of different interest groups; and the importance of political and historical contexts in shaping modes of innovation.

This consensus does not mean opposing views have disappeared. There are still advocates of the “isolated islands of scientific excellence” mode of agricultural innovation capacity building. This sort of thinking is, however, looking increasingly out of step with the new demands and opportunities that the agricultural sector is currently facing.

What is interesting is that it is not necessarily agreement on approaches that is driving this move to consensus. Rather, it is the fear of an altogether different set of future agricultural scenarios, where the common themes mentioned above are predicted to have enormous importance.

It is now clear that the agricultural sector is moving into an era of rapidly changing market, technological, social and environmental circumstances that are evolving in often unpredictable, non-linear ways (see Box, left). This is an era where collective intelligences will replace centres of excellence, and where the ability to use knowledge effectively in response to changing circumstances will define countries’ resilience to local and global shocks, their capacity to make use of technological developments and their ability to compete in global markets.

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Coping and prospering in this new era will require scientists, policymakers, consumers and entrepreneurs to seamlessly organise their interactions in order to mobilise knowledge and continuously innovate in the face of change. A dream? Currently, yes. A necessity? No doubt about it.

Not surprisingly, then, the idea of agricultural innovation systems has all of a sudden started to look very attractive to planners.

**Agricultural Innovation Systems: Another Competing Narrative or a Metaphor for Diversity?**

Every agricultural innovation systems specialist has an interpretation of what this idea entails. One definition is that an innovation system comprises the organisations, enterprises and individuals that demand and supply knowledge and technologies, as well as the policies, rules and mechanisms that affect the way different agents interact to share, access, exchange, and use knowledge (World Bank, 2006).

But is this just one more competing narrative of how agricultural science and innovation should be organised? Commentators accustomed to polarised narratives and blueprint approaches could understandably make the mistake of seeing this as another aspiring alternative. Of course, in many senses it is an alternative model, but what it doesn’t do is make prescriptive recommendations along the lines of “for innovation to take place one must have a system with one private sector actor, one research actor, one banker, one policymaker and one farmer — all with pre-specified roles.” And this is where most people get confused.

Instead, it points out that what is required are coordinated networks of actors relevant to specific challenges or opportunities and locations — and accompanied by supporting policies and ways of working specific to those challenges, opportunities and locations. Recent work at LINK on the nature of innovation capacity suggests that a range of different types of innovation systems already exist and predicts that this diversity will increase in the future (Hall, 2005).

These systems range from public sector, science-driven systems working on food crop productivity, through private sector-coordinated networks innovating around value chains, to participatory partnerships between science and local communities focusing on natural resource management. They rely on scientific and other sources of knowledge to differing extents, and have different governance mechanisms. Some will be largely self-organising while others will need public intervention to organise interaction.

My argument is that innovation systems is not another competing innovation narrative in the vein of past polarised debates. Instead, it is a metaphor to explain the principles behind the existence of a diversity of collective intelligence mechanisms for organising interaction for innovation — some more collective, some less so; some more participatory, some less so; some more pro-poor, some less so.

In the fast approaching future the agricultural sector will require this diversity in collective-intelligence mechanisms to meet its multiple agendas. It will also need a pattern of diversity that continues to evolve in order to cope with an ever-changing set of demands and opportunities that the sector will inevitably face.

**The Big Question**

If one takes the innovation systems idea as a metaphor for diversity, it is possible to see a number of new ways forward that point to one critical unanswered question.

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**Lessons from self-organising systems of innovation:**

**The trajectory of NERICA rice in West Africa**

The dilemma with NERICA rice (a family of improved rice varieties specially adapted to the production conditions of West Africa) is familiar to those working with variety-based agricultural technology — the technology is good but the uptake and spread is not as fast as expected. LINK researcher Dr. Daniel Dalohoun has revisited this old problem from his new and unique perspective on agricultural innovation, which he developed during his doctoral studies at UNU-MERIT.

The study compares the spread of the rice variety in Guinea and Benin by exploring innovation processes in the two West African countries. In Guinea, this was characterised by a large-scale technology promotion campaign that focused on training farmers. In contrast, Benin had no such programme — although, significantly, there was a public awareness campaign in the local media, but not focused specifically on farmers. It is in Benin, surprisingly, that rice production, process and consumption innovation is more apparent.

Dr. Dalohoun argues that a critical series of developments related to the use of NERICA — but not the result of any specific NERICA-related interventions — have taken place in Benin through the actions of the different players involved in the country with an interest in rice. These developments include: new links between rice growers and the processing industry; new links between different elements of the rice seed system, including both private sector organisations and the extension services (even though these are rather weak); and new credit arrangements to allow the bulking up of seed. It has also taken the involvement of political actors to make changes in the seed system possible. The net result of these developments is that NERICA rice is starting to be produced, processed and consumed quite widely in Benin, unlike the case of Guinea.

What is particularly interesting is the apparent emergence of architecture of different players connected together and allowing for the widespread adoption and spread of this technology. The architecture and effectiveness of different elements is far from perfect, but, nevertheless, it is starting to knit together. Dr. Dalohoun argues that this knitting together is a self-organising process.

The research has identified some of the critical factors that lead to self organisation. On this basis it sets out an alternative approach to the usual extension system/seed system/technology promotion intervention. The radical recommendations of this research suggest an exciting new direction to help resolve a problem that is almost as old as agricultural research. The write-up of this research should be finished by the end of this year.

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**LINK RESEARCH IN FOCUS**

**A Spotlight on Current Work by LINK Researchers**

**Lessons from self-organising systems of innovation: The trajectory of NERICA rice in West Africa**

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Dr. Dalohoun argues that a critical series of developments related to the use of NERICA — but not the result of any specific NERICA-related interventions — have taken place in Benin through the actions of the different players involved in the country with an interest in rice. These developments include: new links between rice growers and the processing industry; new links between different elements of the rice seed system, including both private sector organisations and the extension services (even though these are rather weak); and new credit arrangements to allow the bulking up of seed. It has also taken the involvement of political actors to make changes in the seed system possible. The net result of these developments is that NERICA rice is starting to be produced, processed and consumed quite widely in Benin, unlike the case of Guinea.
We can start, for example, by forgetting the dichotomy-style debates about whether we need to support local farmer innovation rather than private sector development of high value commodity chains or support traditional plant breeding rather than science-intensive biotechnology product development. We need all of these and more. And we need them to tackle a common challenge, the solution to which is going to be central to our ability to mobilise scientific and other sources of knowledge to cope and prosper in the future era of rapid change.

We urgently need to know how to organise these different sorts of interactions and build the right sorts of connections among relevant actors in society. And, at the moment, most of us haven’t got a clue how to do this.

**Creating Space for Diversity and Sharing Innovation Experiences**

Ultimately, the question of organising interactions for innovation is a question of what policies and institutional regimes are going to be needed to make this happen, and happen in ways that best balance the trade-offs among societies’ multiple goals. It appears there are two priorities here if we want to help stimulate institutional and policy change.

The first is to create the space for the diversity of different ways of organising interactions to emerge. The greater the diversity we create, the more experiences there are to help us understand how best to organise for innovation. This, in turn, helps us develop policies and institutions that support the collective intelligence approach across the agricultural sector and the wider society it is located in.

The problem here is that to bring about policy and institutional changes one needs sufficient diversity of innovation experiences in our repertoire, to draw generalities from and make decisions and institutional changes one needs sufficient space for doing things differently. One can imagine a ratchet effect where new innovation experiences bring about small policy changes, which in turn open up new space. However, the history of agricultural research and innovation suggests that this process is very slow.

Special projects, non-government organisations, and the private sector have been steadily generating different innovation experiences. Similarly the innovation studies community — while relatively small — has also built on a large body of different experiences and come up with a range of often overlapping policy perspectives on how to promote agricultural and rural innovation.

Maija Hirvonen recently completed a LINK “tourist guide” to agricultural innovation studies (Forthcoming, 2007) and identified five distinctly different, although overlapping, schools of thought on this topic. Our search for initiatives to profile in the LINK LOOK is identifying increasing numbers of practical projects with an agricultural innovation component.

So why, then, haven’t these different innovation experiences been better deployed in institutional and policy change? I believe the underlying problem here is related to the issue raised earlier about the way the diversity of approaches and experiences has led to atomisation and contending coalitions rather than coherence and collective learning.

**REFERENCES**


For further details on LINK activities and publications, visit our website at www.innovationstudies.org or contact us at info@innovationstudies.org. The LINK News Bulletin is edited by Kumuda Dorai and Andy Hall. For more information on UNU-MERIT, visit www.merit.unu.edu.