

A TOURIST GUIDE TO SYSTEMS STUDIES OF RURAL INNOVATION

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EDITOR'S NOTE

WHAT IS WRONG WITH THIS REPORT?

At the very outset, we feel obliged to warn our readers that our comprehensive guide to rural innovation systems is anything, but. Since we hope that this is a pilot rather than a definitive guide we felt it useful to point out its limitations (and our own) in the hope others can take up where we left off.

(i) Out-of-date/ limited

By the time this report goes to print, it will already seem very out-of-date because it will be. The last few years have been witness to the rapid emergence of the field of rural innovation studies in agricultural research. Almost every day there appear to be new organisations working on issues dealing with rural innovation and researchers bringing out new reports. These often expand current thinking and allow for new schools of thought to emerge. In the face of this constant flux of ideas and the shifting nature of current discourse around the field our report will appear dated, although hopefully not obsolete. We are also aware that the report may have missed publications or different research groups working in this field. Exclusions are not by design but the result of our limited ability to keep pace with rapid changes. If you feel we have missed your work please do let us know.

(ii) Limited scope/ The Netherlands-centric

Our readers will notice that a majority of the organisations featured and people interviewed are based in The Netherlands. This is not to say that we believe the country to be the epicentre of systems thinking on rural innovation — although a number of organisations and researchers working on issues of rural innovation are Dutch. The truth is the author was based in The Netherlands at the time and the face-to-face interviews she conducted reflect convenience rather than any intrinsic bias we have toward the Dutch!

(iii) Artificial categorisation

The categories into which we have lumped the various organisations in the field — and the bibliography they have produced — are ones that we have created based on our take on the issues and themes we deem significant as well as our understanding of research of others in the field. Researchers and organisations may find themselves categorised in a way they disagree with and we apologise for that.

(iv) Biases we bring to it with our work and those of our friends

Our discussion of the ongoing themes and issues in the field, the categorisations we have come up with and the conclusions we have drawn reflect our own personal biases and that of our work. In our inclusions and discussions of certain organisations and literature we may also be accused of being biased toward the work of our friends and we have no justifiable explanation for that other than while our biases may have made us blind to other significant contributions to the field, suggestions from readers on points we have excluded will not fall on deaf ears.

(vi) English language

Lastly, we would be remiss if we didn't mention the obvious bias toward literature in the English language. Obviously, there may be other critical works in French, Spanish and other languages that need to be included in this report. Their exclusion is reflective of our linguistic limitations.

These are just some of the problems with the report that we identified on introspection. Readers, no doubt, will find quite a few more and are welcome to point them out to us at info@innovationstudies.org. Perhaps one solution to the problems is to publish updates of this report as and when we confront new issues and organisations and people dealing with them, and taking into account feedback from others in the field. Again, we are open to suggestions on how to improve on this effort and look forward to hearing from those who read this report at the email address listed above.

The Editors

Andy Hall, Jeroen Dijkman, Rasheed Sulaiman and Kumuda Dorai
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EXECUTIVE SUMMARY

The debates about science, technology and innovation (ST&I) in rural development have seen something of a renaissance in recent years. A series of high profile publications and the adoption of innovation as an organising principle for both policy and action by a number of influential bodies have generated considerable interest in the development studies, agricultural research and donor community.

This 'Tourist Guide' is a resource document charting the emerging landscape of systems studies on rural innovation. Note that the term 'rural innovation' is used rather than 'agricultural innovation' in recognition of the wider scope of knowledge applications that are important in contemporary rural livelihoods. There is a growing body of literature dealing with rural innovation with some research groups developing ideas over the last 20 odd years on the topic. Contemporary literature has also drawn inspiration from diverse fields of scholarship, and with these a rich diversity of interpretations and perspectives have emerged in the form of a number of distinct schools of study with their own epistemological origins. While not exhaustive, this document reviews and provides an annotated bibliography of what we consider some of the key publications contributing towards the current outlook on rural innovation. The material in the document was originally collected between December 2005 and February 2006 and updated again in 2007. We encourage readers to point out errors/ omissions and recent publications.

While a full review of the scholarship that has contributed to contemporary systems studies on rural innovation is beyond the scope of this exercise, the annotated bibliography contains selected readings on the following themes of research:

- **Social Learning and Communication**
- **Local Innovation Processes**
- **Innovation Systems**
- **Institutional Learning and Change**
- **Market Systems and Innovation**
- **Science and Society**

Reviewing literature on these themes suggests that the key points emerging from current debates are as follows:

- **Multiple interpretations.** There are some differences in defining 'systems perspectives on rural innovation', which reflect the various foci of research groups. Some concentrate on the role of communication and information flows within the new innovation environment; some define this innovation environment in a narrow way and mainly in the rural space (research farmers and farm education services) whereas others see a much wider set of actors (particularly the private sector). Others still focus on the role of farmer innovation and expertise of farmers. Another related perspective is the deliberation over the roles of traditional Agricultural Research and Development (ARD) institutions in the innovation environment.

- **Reconciling micro- and macro-perspectives.** The question of 'scales' or 'levels' at which innovation is addressed is also receiving attention. There appears to be widespread acknowledgement of the need to reconcile approaches that concentrate on 'micro-level' interactions in the rural space (such as participatory technology development, client-oriented research and social learning) with macro-level engagement with these issues in the broader innovation environment (policy, market, education, etc.).
- **New ways of monitoring and evaluation.** Designing new ways of monitoring and evaluating outcomes and processes, as opposed to outputs and projects, is also a topical issue. As innovation is increasingly being viewed as a multi-stakeholder process, means of assessing its relevance and success are also being revisited, with qualitative approaches and commonly-agreed-upon criteria featuring alongside more conventional, quantitative impact measurements directed by pre-defined criteria. The importance of the approaches that provide continuous learning opportunities for projects, organisations and institutions, is highlighted in this document.
- **New funding mechanisms.** Similarly, designing new funding mechanisms in attempts to empower clients and direct ARD towards their innovation needs is also a major focus. This requires a reevaluation of funding at all levels — from donors and agricultural research and extension organisations to farmers' and non-governmental organisations.
- **Market linkages.** Market (and associated) linkages are also receiving attention in attempts to promote the translation of specific innovations into sustainable livelihood solutions. Traditionally, 'markets' have been addressed using commodity chain approaches, which tend to embed linear perceptions of technical and/ or economic change, and which thus far have tended not to accommodate the interactive learning processes frequently involved. There are, however, signs that contemporary chain and particularly network approaches are expanding their scopes of analysis.
- **New understandings of capacity.** The emerging understanding of 'capacity' is also receiving attention. It no longer appears appropriate to define capacity solely as scientific and technical expertise; rather, it indicates the ability to meaningfully and equitably participate in the joint learning processes that characterise innovation. This, in turn, implies the need for institutional or attitudinal change and empowerment amongst a broadened set of stakeholders.
- **The political economy of innovation.** Underlying the above points are questions of 'pro-poorness' of innovation — or what has been termed, the political economy perspective. There is widespread agreement that the outcomes of science and technology-related development interventions have varied over geographical regions and socio-economic groups. Raising awareness of farmer innovativeness, and creating methodologies for participatory research are examples of ways through which a more level playing field has been promoted. However, such approaches on their own are unlikely to lead to a more equitable distribution of benefits. Instead, it is necessary to connect them with the wider contexts in which they are situated by acknowledging the fact that no development interventions — with or without a science and technology dimension — take place in political, economic, social, cultural or institutional vacuums.

This exercise has been carried out for the Learning INnovation and Knowledge (LINK)-programme. An initiative of UNU-MERIT and FAO, LINK is a specialist network of regional innovation policy studies hubs aimed at strengthening the interface between rural innovation studies, policy and practice and to promote North-South and South-South learning on rural innovation. (www.innovationsystems.org).

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ACRONYMS AND ABBREVIATIONS

AKIS	Agricultural Knowledge and Information Systems
ARD	Agricultural Research for Development
ASTI	Agricultural Science, Technology and Innovation
CABI	CAB International
CD & IC	Capacity Development & Institutional Change
CGIAR	Consultative Group on International Agricultural Research
CIAT	International Centre for Tropical Agriculture
CIS	Communication and Innovation Studies
CORMA	Client-Oriented Research Management Approach
CRISP	Centre for Research on Innovation and Science Policy
CTA	Technical Centre for Agricultural and Rural Cooperation ACP-EU
DFID	Department for International Development
DGIS	Dutch Ministry for Foreign Affairs/ Directorate-General for International Cooperation
DPP	Development Policy and Practice
FAO	Food and Agriculture Organisation
FARA	Forum for Agricultural Research in Africa
FPR	Farmer Participatory Research
FSR	Farming Systems Research
IAC	International Agricultural Centre
IAR4D	International Agricultural Research for Development
ICRA	International Centre for Development-Oriented Research in Agriculture
IDS	Institute for Development Studies
IFAD	International Fund for Agricultural Development
IIED	International Institute for Environment and Development
ILAC	Institutional Learning and Change
ILEIA	Centre for Information on Low External Input and Sustainable Agriculture
IMI	Initiative for Mainstreaming Innovation
INRM	Integrated Natural Research Management
ISNAR/ IFPRI	International Service for National Agricultural Research/ International Food Policy Research Institute
KIT	Royal Tropical Institute
KNOTS	Knowledge, Technology and Society
LEARN	Learning in Agricultural Research Network
LEISA	Magazine on Low External Input and Sustainable Agriculture
LINK	Learning Innovation and Knowledge
NGO	Non-governmental Organisation
OU	Open University
PLAR	Participatory Learning and Action Research
PRA	Participatory Rural Appraisal
PRGA	Participatory Research and Gender Analysis
PROLINNOVA	Promoting Local Innovation
PTD	Participatory Technology Development
RAAKS	Rapid Assessment of Agricultural Knowledge Systems
RIU	Research Into Use
RNRRS	Renewable Natural Resources Strategy
SLA	Sustainable Livelihoods Approach
SPRU	Science Policy Research Unit
SSA CP	Sub-Saharan Africa Challenge Programme
STEPS	Social, Technological and Environmental Pathways to Sustainability
TAO	Technology and Agrarian Development
UNU-MERIT	United Nations University – Maastricht
UNU-INTECH	United Nations University-Institute for New Technologies
WUR	Wageningen University

SECTION 1

INTRODUCTION

“Today, everyone is working in a systems mode”

- Interviewee from Dutch-based international agricultural research organisation

The debates about science, technology and innovation (ST&I) in rural development have seen something of a renaissance in recent years. A series of high profile publications and the adoption of innovation as an organising principle for both policy and action by a number of influential bodies have generated considerable interest in the development studies, agricultural research and donor community.

This document is intended as a resource for the emerging field of rural innovation studies. It has three aims. The first is to provide an overview of the global groups of researchers — and to a lesser extent practitioners — working with systems perspectives on rural innovation. The second is to identify the main themes that are emerging from this area of scholarship. The third is to provide an annotated bibliography of recent writing on these themes. This document was commissioned by the Learning INnovation and Knowledge (LINK) initiative of UNU-MERIT and the Food and Agriculture Organization (FAO) of the United Nations.

This report is organised as follows:

Section 2 provides a synthesis of the current issues and themes in systems studies of rural innovation.

Section 3 comprises a selected annotated bibliography of work in this field.

Section 4 presents an overview of groups engaging in systems studies and practice on rural innovation and the central themes emerging from their work.

Methodology

This resource document was originally compiled between December 2005 and February 2006 and was further updated in August 2007. It was developed through three exercises — an internet-based mapping exercise to identify programmes that address rural innovation from a systems perspective; semi-structured interviews with those programmes based in The Netherlands to gauge topical questions in systems studies on rural innovation; and a literature review to compile an annotated bibliography of selected readings on such studies.

The selection of programmes and literature relied on one or more of the following criteria:

1. An explicit mention of the innovation systems framework
2. A recognition of innovation as an interactive process of knowledge sharing and learning
3. An acknowledgement that innovation stems from multiple, public and private sources of knowledge; that is, neither solely from ‘formal scientific research’ nor ‘informal farmer research’

4. A recognition that innovation processes are embedded in social, technological, market and political contexts, and that these processes and contexts interact with each other
5. A recognition of the diversity of organisations and individuals within and outside the rural space that plays an active role in the rural innovation process. These include: farmers, research organisations, non-governmental organisations, private sector firms, training organisations, decisionmakers, financial organisations, technical and other service providers
6. A recognition that innovation processes are shaped by the habits and practices of these different organisations and individuals

Semi-structured interviews were carried out with researchers from the International Agriculture Centre (IAC), the Communication and Innovation Studies (CIS) group at Wageningen University (WUR), the Technology and Agrarian Development (TAO) group at WUR, the International Centre for Research in development-oriented Agriculture (ICRA), Centre for Information on Low External Input and Sustainable Agriculture (ILEIA), the Royal Tropical Institute (KIT) and ETC Ecoculture. All of these programmes address rural innovation specifically within the context of development, albeit differing in the degree to which they do so. All interviewees were asked to:

1. Describe the landscape of rural innovation studies, as it appears from their perspective
2. Describe the evolution and the current status of their research agenda on rural innovation, including its positioning with respect to and interaction with other research efforts in the field
3. Describe the research networks with which the groups interact on rural innovation issues
4. Synthesise the emerging issues in the debate

Additionally, a number of researchers known to be active in this area internationally were also contacted (a list of contacted organisations and individuals is provided in Appendix A). All were asked to comment on the frontiers of thinking in, and future challenges of, rural innovation, and to indicate any groups and organisations that they were aware of addressing rural innovation from a systems perspective. Their responses acted as further input into the bibliography.

SECTION 2

A SYNTHESIS OF CURRENT ISSUES & THEMES IN SYSTEMS STUDIES OF RURAL INNOVATION

The new context of rural innovation

Historically, science, technology and innovation policy has equated rural development with agricultural development. Despite the importance of agriculture, the rural economy in developing countries has always involved more than just agriculture and includes enterprises and services such as food processing, textiles, forest products, health care, transport, energy, banking, telecommunications, and water and sanitation. Technological and other forms of knowledge upgrading of these activities have received much less policy attention than agriculture, yet all are clearly important to poverty reduction and sustainability in rural areas.

With the growing diversification of rural livelihood options into non-farm activities and with the increasing interconnectedness of rural areas and activities to the global environment, a new rural economy is emerging. This is bringing with it greater pressures on farmers, companies and governments to innovate in response to, for instance, rapidly changing patterns of competition and market preferences and trade standards. It also brings challenges and opportunities arising from new technology and knowledge in all areas of economic and social activity globally; for instance, biotechnology and information technology. Furthermore the new rural economy is characterised by a growing interconnectedness and knowledge convergence among different areas of economic and social activity. For example, the interconnection of agriculture, food-processing and health, and the knowledge convergence arising from generic scientific knowledge such as gene technology, and generic process knowledge such as governance approaches and learning practices.

These features are distinctly different from the past, or more precisely, they are different from the assumptions that in the past informed policy. The realities of the new rural economy present an entirely different framework for planning science, technology and innovation policy in relation to rural development.

New perspectives on innovation and innovation capacity

Innovation was once thought of as a research-driven process. It is now recognised as an interactive process incorporating a much broader range of activities, actors, practices and policies and contexts. Together these different elements enable the creative use of both new and existing knowledge, information and technology. Since this involves the interaction of many actors with different and competing agendas, governance issues need to be addressed if innovation is going to lead to socially desirable outcomes, such as poverty reduction and environmental sustainability.

While there is no consensus on the precise nature of innovation capacity, its broad features include a combination of:

- (i) Scientific, entrepreneurial, managerial and other skills and knowledge
- (ii) Partnerships, alliances and networks linking different sources of knowledge and different areas of social, economic and policy activity
- (iii) Routines, organisational culture, and traditional practices that pattern the propensity to innovate

- (iv) Clusters of supportive policies and other incentives, governance structures and the nature of the policy process
- (v) The ability to continuously learn how to use knowledge more effectively towards social, economic and environmental goals

These perspectives on innovation and innovation capacity are distinctly different from the assumptions that have shaped commonly-used interventions such as agricultural research, technology transfer, training and rural industrialisation.

Innovation, as a driver of social and economic change, can be of particular significance in the rural sector of developing countries. It is where most of the poor live; it is where major environmental resources are located; and it is where the livelihoods of the most vulnerable communities are interlinked — for better or worse — to rapid technological and market changes that are transforming enterprises and services.

However, the characteristics of the new rural economy, as well as contemporary thinking on innovation, demand that the nature of rural innovation capacity be reconsidered. This raises unexplored policy design and implementation questions. These include questions about how to create capacity that is simultaneously:

- (i) Collective — combining expertise from different science, technology, entrepreneurial and policy domains (agriculture, health, communication, banking, etc.)
- (ii) Dynamic — evolutionary and able to respond to rapidly-changing contexts (technical, market, policy, political and social)
- (iii) Systemic — addressing the challenges and opportunities emanating from the interconnectedness of different spheres of rural and global activity
- (iv) Opportunistic — taking advantage of knowledge convergence in apparently unrelated fields; and
- (v) Sensitive — tackling social, economic and environmental concerns in an integrated fashion

Rural Innovation Policy Studies

As this resource document will illustrate there is a growing literature that underpins the systems perspective outlined above and which informs the innovation capacity building challenges of the new rural economy. The main tenets of this literature include the following:

- The recognition that innovation is an interactive process of knowledge-sharing and learning
- The recognition that innovation relies from multiple sources of knowledge from the public, private and civil society sectors — that is, neither solely from codified sources such as scientific research nor from tacit, empirical sources such as farmers and other types of indigenous knowledge
- The recognition that innovation processes are embedded in social, institutional, technological, market and political contexts, and that innovation processes are intricately linked to, and interact with, these contexts
- An understanding of innovation not as technical processes and capacities, but rather as socio-technical processes and capacities capable of supporting sustainable, equitable and improved social and economic conditions

- An emphasis on putting knowledge into productive use and the critical importance of linkages, partnerships and networks in facilitating this and the institutional and policy settings that shape these arrangements

The systems approach

According to most people interviewed for this document, the first signs of a ‘systems’ approach towards agricultural technology development and dissemination were the emergence of Farming Systems Research (FSR)¹ and Agricultural Knowledge and Information Systems (AKIS).² The FSR concept dates back to the 1970s, and was articulated in response to the growing acknowledgement that research efforts had to be framed by the particular farm-level contexts in which impacts were expected. Thus, FSR developed into a largely extractive and diagnostic framework. However, by the 1980s, FSR had established itself as an isolated discipline alongside other agricultural subjects. Throughout the 1980s, calls were being made to address the isolation and narrowness of FSR by firstly, equipping all agricultural researchers with an appreciation of the farming systems context in which their work would be applied, and secondly, by taking FSR beyond its extractive, information gathering role. Gradually, variations of the ‘basic’ FSR approach started to emerge mainly concerned with extension and training. These developments coincided with the ‘farmer first’-concept,³ through which farmer innovation and the notion of integrating farmers’ and scientists’ expertise began to gain prominence.

The articulation of AKIS in the late 1980s broadened the range of actors to include agricultural education organisations who were seen as playing a role in rural innovation. Moreover, the development of AKIS was a turning point for the extension field, situating traditional extension practice into a wider system. It was a normative model, presenting what an ideal agricultural knowledge system should look like. However, the key lesson from much of AKIS work was that reality rarely coincided with the model, leading to attempts to understand the reasons behind such incompatibility. This led to the evolution of methodologies, such as Rapid Appraisal of Agricultural Knowledge Systems (RAAKS),⁴ which aimed at providing stakeholders with a systems-like outlook towards their activities. RAAKS-methodology is useful since it brings stakeholders together and provides them with the necessary tools to analyse and reflect upon their own system, and to propose ways of improving it. However, as with many reflexive methodologies, difficulties arose with attempting to institutionalise and implement these proposals. RAAKS is one of a large range of participatory approaches that emerged in the 1990s and attempted to realise the synergistic potential of AKIS. However, many of these approaches have subsequently come under scrutiny over the true extent of equitable participation promoted by them.

While the emergence of a systemic approach towards understanding knowledge-based rural change can be traced back to notions of FSR, AKIS and participatory research,

¹ See for instance, Collinson, M. (Ed.) (2000) *A History of Farming Systems Research*. Wallingford: CABI Publishing

² Roling, N. (1988) *Extension Science: Information Systems in Agricultural science*. Cambridge: Cambridge University Press. Also Roling, N. (1992) The emergence of knowledge systems thinking: a changing perception of relationships among innovation, knowledge process and configuration. *Knowledge and Policy*. Vol. 5. No. 1. pp. 42-64.

³ Chambers, R., et al. (Eds.) (1989) *Farmer First*. London: Intermediate Technology

⁴ Engel, Paul & Monique Salomon (1996) *Facilitating Innovation for Development: a RAAKS Resource Box*. Amsterdam: Royal Tropical Institute.

and have been discussed at length in previous literature,⁵ these are only briefly mentioned here. The aim of the current exercise is to explore how different schools of thought are building on these earlier perspectives and incorporating new ideas and perspectives.

Interpretations of Systems perspectives

Systems perspectives is a widely-used term to describe contemporary research efforts in rural change. Overall, ‘innovations’ are understood as complex socio-technical arrangements. There is broad recognition that the process of innovation involves interactive learning (some refer to it specifically as ‘social learning’) and multiple sources of knowledge. Similarly most systems studies recognise that innovation processes are embedded in particular social, historical, market and political contexts. Understanding and/ or trying to influence institutional dimensions of innovation (‘attitudinal change’) is receiving much attention. However, there are also some subtle differences in definitions of ‘systems perspectives on rural innovation’, which reflect the various foci of research groups. In other words differences are often related to the particular views of the boundaries of the system, its key actors and processes. Some concentrate on the role of communication within the new innovation environment; others focus on the role of farmer innovation and expertise therein; while others still deliberate the roles of traditional Agricultural Research and Development (ARD) institutions in such a setting.

Emerging schools or themes of debate

The semi-structured interviews and review of literature point to six apparently distinct schools, traditions, or themes of debate. These are a useful, albeit artificial, way to organise the interview findings and the annotated bibliography that follows in Section 3. This categorisation of literature is by no means set — indeed, considerable overlap exists between the various groups of material, indicating the high degree of interconnectedness among factors that characterise rural innovation.

1. Social Learning, Communication and Agricultural Innovation

The scholarship and practice in this theme deals with concepts and practical means through which joint learning between different actors can be facilitated. A central concept is the idea that learning is a collaborative process, often involving stakeholders from distinct communities of practice with often conflicting norms, values, needs and interest. The creative tension and combinational effects of diversity in collaboration are viewed as key ingredients in innovation. The theme has a particular focus on the role of communication in joint learning and this reflects the historical origins of some of the research groups in agricultural extension studies. A key focus in research efforts has concerned the rethinking or reconceptualising of routinely-used agriculture and rural development practices from this social learning perspective and looking at ways in which these can better service society’s needs.

2. Local Innovation Processes

⁵ For the latter, see for instance, Bainbridge, V., S. Foerster, K. Pasteur, M. Pimbert, G. Pratt, I. Yaschire Arroyo (2001) *Transforming Bureaucracies : Institutionalizing participation and people-centred processes in NRM: An annotated bibliography*. London: IIED. See also Gonsalves, J., et al. (Eds.) (2005) *Participatory Research and Development for Sustainable Agriculture and Natural Resource Management. Volume 1: Understanding Participatory Research and Development*. Lima, Peru: CIP & Ottawa, Canada: IDRC.

The scholarship and practice in this theme positions itself as an alternate paradigm to the Green Revolution-era technology transfer approach. A characteristic practice is Participatory Technology Development (PTD). This refers to a range of mechanisms for enhancing the ability of researchers, extensionists and other service providers and land users to collaborate in developing and spreading improved agricultural practices — with farmers and other land users being given a central role in defining the research and development agenda, and in the planning, implementation and evaluation of activities. The concepts and literature place heavy emphasis on the development and promotion of the PTD approach, which aims to enhance the research and development capacities of farmers and other land users, by acknowledging farmers' own skills and knowledge in articulating challenges and exploring solutions to them. Critical challenges posed by this theme are how to 'institutionalise' or "scale-up and out" the approach.

3. Agricultural Innovation Systems

The scholarship and (limited) practice in this theme builds on the concept of national systems of innovation and applies this to agriculture and rural development. The central concept is that innovation is an evolutionary and interactive social process where networks of diverse knowledge sources combine new and existing information in response to a dynamic series of challenges and opportunities. The concept recognises that under this process the patterns of interaction are highly context-specific and shaped to a large degree by the institutional and policy setting in which these take place. Learning, institutional innovation and consequent behavioural changes of the system are viewed as the key means and measures of capacity development. Early work on agricultural innovation systems was mainly historical in orientation and tended to position innovation systems perspectives as an alternative to technology transfer/ linear perspectives. More recent work has been focused toward operationalisation of the perspectives and has presented innovation systems as a metaphor for the diversity of different ways of organising innovation that do and need to exist. Critics point to the framework's inability to deal with the political economy of knowledge. While much has been written on reconceptualising existing agricultural research and extension activities in the light of this new concept, the key challenge remain in finding ways to operationalise the perspective. Re-orientating dominant research practice and policy environments towards this perspective remain an uncompleted agenda.

4. Institutional Learning and Change for agricultural innovation

The scholarship and practice in this area has its roots in attempts to introduce a learning perspective to impact assessments of agricultural research effort, particularly those in the CGIAR. The theme's central argument is that until a learning orientation is introduced prospects for improving the impact of research on poverty reduction are limited. It draws inspiration from innovation systems perspectives, organisation change, positive deviance and knowledge management practice. The theme's mantra is roughly "it's not what we do; it's the way that we do it", whereby new research practices and other institutional innovations are seen as the principle means of better achieving mission goals. Self-reflection is pointed to as a way of structuring or routinising learning and developing and legitimising new practices. Practice in this area focuses on developing mechanisms that can facilitate enhanced learning. Key challenges are operational both at the organisational level and at the level of bringing

about policy-level changes in the framework conditions of agricultural research, particularly in the international agricultural research arena.

5. Markets, Value Chains and Innovation

An emerging area of scholarship and practice is addressing the question of ways innovation can be used to improve the stakeholding of the poor in local and global agriculture-based value chains. This theme builds on a large body of work that has explored the political economy of global value chains. It also draws on innovation systems perspectives where technical and institutional innovations, including marketing innovations, are seen to emerge through a co-development process. Much of the existing literature focuses on documenting and drawing lessons from emerging practice and developing tools to aid practitioners. Key challenges remain in understanding the type of policy and incentive regimes needed to promote pro-poor objectives in value chains and associated patterns of innovation capacity.

6. Science and Society

This theme of scholarship has a long history of documenting and conceptualising the relationship between science and society. In the development studies arena, questions around the political, economic and power dimension of knowledge have played a prominent role in debates. A practical offshoot of this school of thought was the participatory research movement and its underlying questioning of “whose knowledge counts”. The theoretical perspectives of this theme have played an important role in critiquing areas of development practice where knowledge plays an important role. The key challenge for the perspective is to provide a viable alternative that can be put into practice. The Shambu Prasad school of thought on this suggests that the way forward is to create opportunities for more “encounters” between the scientific knowledge community and other knowledge-based communities of practice in civil society and in this way challenge accepted narratives and articulate new questions for science to address.

A synthesis of emerging issues in rural innovation studies

(i) Micro or macro level engagement

The question of ‘scales’ or ‘levels’ at which innovation is addressed is also receiving attention. There appears to be widespread acknowledgement of the need to reconcile or situate approaches that concentrate on ‘micro-level’ interactions (participatory technology development, client-oriented research, social learning, etc.) with those that tackle process and capacities at the level of the broader innovation environment, which includes but goes beyond the rural space. These macro perspectives are often informed by ideas with roots in the notion of national systems of innovation, whereas the micro perspectives are more strongly associated with a people empowerment agenda. Ultimately, the difference between these perspectives lies in the nature of innovation capacity and what it may look like from a systems view (see below).

The issue of scales raised differing reactions from those interviewed. While some maintained that most micro-level approaches have been limited in scope, focusing solely on farmer-extension-researcher interactions, others were adamant that they have always encompassed the types of broader perspectives that are being called for today — actors and interaction within and beyond the rural space and including the private sector and policy organisation. Examples of initiatives integrating various

micro and macro-perspectives towards innovation include research by the Communication and Innovation Studies Group (Wageningen University). Others integrating different perspectives into a more comprehensive framework includes the CTA, KIT, CABI and Free University of Amsterdam — all of which work on Agricultural Science and Technology Innovation (ASTI) systems and aim to link farmers, research and extension services and policy processes. KIT has also embarked upon an initiative to develop a framework that integrates commodity and supply chains with innovation systems-concepts (the ‘T-model’ of agricultural innovation).

(ii) Systems views on innovation capacity

The emerging understanding of rural innovation is also leading to reconsiderations of what ‘capacity’ might mean in this context. It no longer appears appropriate to define capacity solely as scientific and technical expertise; rather, it implies the ability to meaningfully and equitably participate in the joint learning processes (articulating challenges, objectives, interests, expertise and motivations; finding means of making them compatible; and collectively addressing them) that characterise innovation. This, in turn, implies the need for institutional or attitudinal change and empowerment among a broadened set of stakeholders.

(iii) Monitoring and evaluation

Designing new ways of monitoring and evaluating impacts and processes, as opposed to outputs and projects, is also a topical issue. As innovation is increasingly being viewed as a multi-stakeholder process, means of assessing its relevance and success are also being revisited, with qualitative approaches and commonly-agreed-upon criteria featuring alongside more conventional, pre-defined, quantitative impact measurements. The emerging qualitative approaches are seen as crucial in providing continuous learning opportunities for projects, organisations and institutions.

(iv) New funding mechanisms

Designing new funding mechanisms in attempts to empower clients and direct ARD towards their innovation needs is also a major focus. This requires a re-evaluation of funding at all levels — from donors and agricultural research and extension organisations, to farmers’ and non-governmental organisations. Activities in this area are being carried out by KIT and ETC Ecoculture (through PROLINNOVA), which are both investigating farmer-led innovation funds.

(v) Combining value chain and innovation systems approaches

Market (and associated) linkages are also receiving attention in attempts to promote the translation of specific innovations into sustainable livelihoods solutions. Traditionally, markets have been addressed using commodity chain approaches, which tend to embed linear perceptions of technical and/ or economic change. There are, however, signs that contemporary chain and particularly network approaches are expanding their scope of analysis. As mentioned above, KIT is aiming to combine innovation systems theory (which it sees as a horizontal framework) with a commodity and supply chains approach (which it sees as vertical frameworks) in efforts to redress the shortcomings of previous efforts.

(vi) The governance of innovation

Underlying the above points are questions of ‘pro-poorness’ of innovation — or what has been termed, the political economy perspective.⁶ As exemplified by the Green Revolution, there is widespread agreement that the outcomes of science and technology-related development interventions have varied amongst geographical regions and socio-economic groups. Raising awareness of farmer innovativeness, and creating methodologies for participatory research are examples of ways to create a more level playing field. The macro-perspective outlined above argues that such approaches on their own are unlikely to lead to a more equitable distribution of benefits. Instead, it is suggested that it is necessary to connect them with the wider innovation environment in which they are situated. As alluded to earlier the macro-perspective raises new policy questions about how social goals will be achieved in this wider and usually highly contested stakeholder arena. The question of the governance of innovation is therefore critical in reconciling the perspectives and approaches of the poor-centric micro-level participatory view with the all-encompassing, macro innovation environment view. Associated with these is a series of operational questions about new funding mechanisms, monitoring and evaluation methods, and capacity strengthening approaches needed to implement pro-poor governance of innovation.

⁶ Recent material specifically addressing such issues include Leach, M., I. Scoones & B. Wynne (Eds.) (2005) *Science and citizens: globalisation and the challenge of engagement*. London: Zed Press. See also Scoones, I. (2005) Governing technology development: challenges for agricultural research in Africa. *IDS Bulletin*. Vol. 36. Issue 2. Pp. 109-114.

SECTION 3

ANNOTATED BIBLIOGRAPHY

THEME 1: SOCIAL LEARNING, COMMUNICATION AND AGRICULTURAL INNOVATION

The scholarship and practice in this theme deals with concepts and practical means through which joint learning between different actors can be facilitated. A central concept is the idea that learning is a collaborative process, often involving stakeholders from distinct communities of practice with often conflicting norms, values, needs and interest. The creative tension and combinational effects of diversity in collaboration are viewed as key ingredients in innovation. The theme has a particular focus on the role of communication in joint learning and this reflects the historical origins of some of the research groups in agricultural extension studies. A key focus in research efforts has concerned the rethinking or reconceptualising of routinely-used agriculture and rural development practices from this social learning perspective and looking at ways in which these can better service society's needs.

Gass, G., S. Biggs & A. Kelly (1997). Stakeholders, Science and Decision-Making for Poverty-Focused Rural Mechanisation Research and Development. *World Development*. Vol. 25. No. 1 Pp. 115-126

Keywords: stakeholder analysis, research policy, rural mechanisation, poverty, rural development, participatory research.

This article argues that the long history of poor results from rural mechanisation research and development interventions is at least partly attributable to the narrow set of criteria that has guided the design, as well as monitoring and review, of projects. The authors outline a range economic, social and institutional issues that are as crucial as technical considerations in rural mechanisation, and argue for a more holistic view of the process to be adopted by research and development organisations. The paper presents two complementary tools — an adapted Tinbergen Framework and Stakeholder Analysis — as means through which research and policy-makers can better understand how their decisions relate to social and institutional environments. The article begins with a critical reflection of the traditional top-down, 'social engineering' paradigm of development intervention, and the type of agricultural intervention practiced therein. The authors argue that this approach works against the local dynamics of rural reality, which encompasses a wide range of actors involved in technology generation and diffusion. Moreover, they make the case that the most notable inadequacy of social engineering is its demarcation between 'mechanical hardware' and the social and institutional implications of its introduction into and diffusion through rural societies, suggesting instead that it is the mix between technologies and institutions that is crucial. Following from this, agricultural development should be considered a context-specific activity, which universal interventions will not be able to effectively address. Similarly, the articulation of criteria for evaluating rural mechanisation research and development is not an apolitical process, in which local community dynamics can be ignored, or 'neutral reasoning' can be separated from personal or professional interests. Instead, this is a highly political and value-laden activity. The authors suggests that "without

considering issues relating to the incorporation of a range of stakeholder perspectives, it is impossible to decide which criteria should guide the direction and pattern of R&D and of mechanisation promotion initiatives more generally” (p.117). The article moves on to present a summary of criteria used for rural mechanisation research and development, arguing that for more acceptable technologies to be developed, it is necessary to understand the evaluative criteria used by a range of stakeholders involved in the mechanisation process. The authors also make the case for including environmental sustainability criteria to evaluations of rural mechanisation, but are sceptical about the ways in which such criteria might be used by large aid agencies. Having considered the range of issues implicated in evaluating rural mechanisation, the article concludes by presenting conceptual tools to help researchers and policymakers perceive rural mechanisation processes more realistically. These tools are based on a ‘reworked’ Tinbergen framework (which allows for the analysis of the implications of institutional decision-making in rural mechanisation), and stakeholder analysis (which enables the analysis of implications of a range of different courses of action for different stakeholders, and the identification of institutional and individual actors most likely to favour and press for particular kinds of change).

Houkonnou, D. (2002). Linking up with local dynamics: Learning to Listen: Lessons from West African experiences in Leeuwis, C. & R. Pyburn (2002) (Eds.) *Wheelbarrows full of frogs: social learning in rural resource management*. Assen: Koninklijke Van Gorcum. Pp. 105-118.

Keywords: local dynamics, development intervention, linkages to intermediary and support services, joint learning.

The main argument of this paper is that the impact of development intervention projects could be improved if such projects were articulated with respect to local contexts through joint learning processes amongst development ‘intervenors’ and local communities. More specifically, the author argues that the capacity of ‘intervenors’ to engage in such learning must be developed. The article outlines the general nature of development interventions implemented in West Africa since the 1960s, highlighting that they have embedded norms of ‘rapid modernisation’, ‘industrialised development processes’ and ‘project and expert cultures’, and dismissed local grassroots initiatives, capacities and knowledge. The author argues that while today many development projects are proving to be unsuccessful and costly, a range of grassroots organisations are achieving significant results. However, these results tend to have limited impact due to a lack of effective or organised links between local, intermediary and other support levels, thereby highlighting the importance for synergistic interactions with diverse actors. The paper presents an overall assessment of development practice in Africa, and analyses positive solutions emerging from the grassroots as well as questions of linkage accompanying increasingly prevalent trends of decentralisation. The author takes ‘local dynamics’ to mean “the various forces on the move, in the continuously changing environment of Africa, helping local communities to meet some of their priority needs” (p. 110). Referring to research on these local dynamics that shows the extensive local-level innovation processes taking place to improve production systems, set up financial institutions or create communal health facilities, the author explores how effective partnerships could be built with local dynamics in order to capitalise on their potential for more sustainable development. Central in such partnerships are learning processes, which imply that “development ‘intervenors’ should develop their capacity to listen, deconstructing their frames of reference and mentalities, and helping local people

regain confidence lost under the predominance of ‘expert culture’” (p. 117). This would allow development practice to be guided by local realities and social values, as opposed to externally prescribed (market or technological) goals.

Leeuwis, C. & R. Pyburn (2002) (Eds.). *Wheelbarrows full of frogs: social learning in rural resource management*. Assen: Koninklijke Van Gorcum

Keywords: social learning, agriculture, natural resource management, theoretical evolution, practical tools.

This book collates writings from various authors on ‘social learning’ in the context of rural resource management. It presents an overview of current thinking on social learning and identifies a number of areas for critical reflection, further debate and future research. The notion of social learning originally arose as a critique of earlier development interventions, entrenched in technological and/ or economic determinism, which were designed according to a norm of top-down, rational planning. Social learning, in contrast, suggests that “the shared learning of interdependent stakeholders is a key mechanism for arriving at more desirable futures” (p. 11). The contributions in the book argue that contemporary complex and interconnected rural challenges cannot be effectively addressed according to the past paradigm. Being largely anthropogenic, these challenges require instead an approach based on interactive problem-solving, conflict resolution, shared learning, convergence of goals and concerted action. The book’s title draws upon a Dutch metaphor used to reflect the dynamic and unpredictable nature of the social learning process, capturing the balancing act required to keep all frogs (multiple stakeholders) inside a wheelbarrow (a platform for social learning) while manoeuvring across potentially treacherous terrain (rural resource management dilemmas). The book is organised into seven parts, all reflecting some of the major discourses on social learning. Part 1 charts the evolution and significance of theories of social learning. Part 2 addresses social learning specifically in agriculture, presenting an interactive research approach. Part 3 of the book concentrates on concrete ideas and challenges of facilitation in social learning. Part 4 is titled ‘Divergent discourses’ and focuses on the existence of different language communities in the context of social learning. Part 5 considers the relationships between social learning, institutions and institutional change. Part 6 explores connections between social learning and associated bodies of theory to further develop the concept, including the sociology of knowledge and social psychology. Part 7 concludes the book.

Leeuwis, C. (2004). *Communication for Rural Innovation: Rethinking Agricultural Extension*. Blackwell: Oxford. 3rd.

Keywords: extension, innovation, social learning, network building, conflict management, communication.

This book is the re-titled third edition of *Agricultural Extension* (Van den Baan & Hawkins 1988; 1996). The point of departure for the book is the new agricultural innovation landscape confronted by increasingly diverse stakeholders, and the role of traditional extension practice therein. Reflecting contemporary understandings of ‘innovation’, the central premise of the book is that extension as a means of transferring pre-packaged, simple and universal technological interventions for agricultural improvement is no longer valid according to the contemporary outlook on agriculture in the South, which is characterised by complexity, location-specificity and multiple stakeholders. Within such a setting, it is increasingly accepted that beneficial outcomes are more likely to result from interactive networks among diverse participants aiming for commonly identified outcomes. Consequently, traditional

extension practice must be revisited, with a central focus on the role and nature of communication. Indeed, the professional identity of extension agents is changing as a result of various stakeholders (termed ‘communication specialists’, ‘communication workers’ or ‘change agents’) carrying out the activities traditionally considered the domain of extension agents. A common factor among these stakeholders is the “deliberate use of communication to stimulate change”. Conventional communicative intervention has been characterised by top-down planning and instrumental communication, embodying notions of problem-solving through blueprint planning, rational decision-making theory, and mechanical view of social change and innovation. However, since the 1980s, intervention began to be understood as a flexible process, with goals and means being continuously adapted to ever-changing circumstances, insights and emergent dynamics. Notions of network building, social learning and negotiation replaced the idea of ‘planning’. Network building refers to innovation and change which “imply the establishment of new relationships between people, technical devices and natural phenomena”. Social learning has arisen from the idea that “change is connected to individual and/ or collective cognitive changes of various kinds”. Negotiation builds on the notion that “meaningful changes of the status quo are frequently accompanied by conflicts of interest between stakeholders and that such conflicts need to be resolved by negotiation in order to make change possible”. Communication under such intervention circumstances is considered *interactive*. The book is divided into six parts. Part 1 discusses the evolution of the context and societal role of what has been known as ‘agricultural extension’. Part 2 considers the relationship between human practice, knowledge and communication. Part 3 discusses innovation as a process of network building, social learning and negotiation. Part 4 deals with practical aspects of communication for innovation, outlining various methods for this purpose. Part 5 addresses organisational and inter-organisational activities related to innovation. Part 6 presents topics for further study.

Leeuwis, C. (2004). Fields of Conflict and Castles in the Air: Some thoughts and observations on the role of communication in public sphere innovation processes. *Journal of Agricultural Education and Extension*. Vol. 10. No. 2 Pp. 62-76.

Keywords: extension, innovation, social learning, network building, conflict management, communication.

This article deliberates changes in the understanding of agricultural technology development and dissemination, and their implications for traditional extension practice. The article takes as its starting point the notion that systemic concepts of innovation — in which social learning, network building and conflict management are central — are replacing conventional linear formulations of technology development and dissemination. As a consequence, traditional extension practitioners have a new role to play as communication professionals, facilitating interactions among diverse actors, as opposed to distributing technological packages to a narrow set of stakeholders. More broadly, the author argues that the role of scientists within this emerging understanding of innovation is to make explicit implicit assumptions, claims and knowledge gaps in social learning processes, and to engage in collaborative research with societal stakeholders on appropriate natural and social science questions. The article concludes by presenting a resulting research agenda for Communication and Innovation Studies at Wageningen University, with relevance for rural development, sustainability, health promotion and agricultural chain management. The agenda includes investigating the construction of coherence (or incoherence) in new technical and socio-organisational arrangements through

recognising and connecting different forms, kinds and sources of cognition in social learning and negotiation processes; as part of this, investigating the interactions between natural and social science and scientists; exploring institutional influences (backgrounds of societal stakeholders; organisational, administrative, financial structures; etc.) on innovation within emerging and expanded ‘knowledge markets’ of agricultural expertise; examining alternations between ‘top-down’ and ‘bottom-up’ moments and interventions in socio-technical transformation processes; and methodology development for process monitoring.

Röling, N. (2002). Beyond the aggregation of individual preferences: Moving from multiple to distributed cognition in resource dilemmas in Leeuwis, C. & R. Pyburn (2002) (Eds.) *Wheelbarrows full of frogs: social learning in rural resource management*. Assen: Koninklijke Van Gorcum. Pp. 25-48.

Keywords: social learning, cognition, interactive platforms, resource dilemmas, eco-challenge, sustainable societies.

This paper approaches ‘social learning’ from the perspective of cognition, arguing that ‘social learning’ can best be understood as a move away from multiple and towards collective and/or distributed cognition through interactive platforms. According to the author, collective cognition emphasises shared attributes, such as shared values, myths, theories or actions. Distributed cognition, on the other hand, refers to different but complementary contributions that enable concerted action. Multiple cognition, on the other hand, suggests the concurrent existence in a given situation of different cognitive agents with multiple (often incompatible) perspectives. These agents tend to maintain their respective isolation until they become interdependent through, for instance, the reliance on a mutual resource. While conflict may arise under such circumstances, it is equally likely that they meet on platforms for negotiation and decide upon collective action. The author explores the implications of understanding ‘social learning’ in terms of shifts from multiple to collective/ distributed cognition, arguing that it contributes towards the emergence of interactive platforms to address the anthropogenic eco-challenge, and to build sustainable societies. The author traces such platforms to the increasingly common experience that neither technological nor market forces alone can resolve resource dilemmas — or “when no human decision-making capacity exists at the hard system level at which problems are perceived to be solvable” (p. 39). Platforms provide the soft systems complement. While outlining the potential of social learning as a means of collectively addressing common challenges, the author also highlights some challenges inherent in the concept — including the likelihood of unsatisfactory compromises and the inability to take concerted and timely action — which might risk the re-emergence of calls for hierarchical systems for managing resource dilemmas.

Further reading on social learning, communication and agricultural innovation:

Bawden, R. (1994). Creating learning systems: a metaphor for institutional reform for development. In I. Scoones and J. Thompson (Eds.) (1994) *Beyond Farmer First: Rural people’s knowledge, agricultural research and extension practice*. Pp. 258-263. Intermediate Technology Publications: London.

Dore, J., Keatin, C., Woodhill, J., & Ellis, K. (2000). *Sustainable Regional Development: SRD Kit – a resource for improving the community, economy and environment of your region*. Canberra, Australia.

Dormon, E.N.A., Leeuwis, C., Fiadjoe, F.Y., Sakyi-Dawson, O., & Huis, A. van (2007). Creating space for innovation: The case of cocoa production in the Suhum-Krabo-Coalter district of Ghana. *International Journal of Agricultural Sustainability* 5 (2&3), p. 232-246.

FAO/World Bank (2000). *Agricultural knowledge and information systems for rural development (AKIS/RD). Strategic vision and guiding principles*. FAO/ World Bank: Rome, Italy.

Holling, C.S. (1995). What barriers? What bridges? In L.H. Gunderson, C.S. Holling & S.S. Light (Eds.) (1995) *Barriers and bridges to the renewal of ecosystems and institutions*. Pp. 3-37. Columbia University Press: New York.

Hounkonnou, D., Kossou, D.K., Kuyper, T.W., Leeuwis, C., Richards, P., Röling, N.G., Sakyi-Dawson, O., & Huis, A. van (2006). Convergence of Sciences: The management of agricultural research for the smallscale farmers in Benin and Ghana. *NJAS Wageningen Journal of Life Sciences* 53 (3/4), p. 343-367.

Leeuwis, C. (2004). Reconceptualising participation for sustainable rural development: Towards a negotiation approach. *Development and Change*. Vol. 31. No. 5. Pp. 931-959.

Röling, N. (1988) *Extension Science: Information Systems in Agricultural science*. Cambridge: Cambridge University Press.

Röling, N. & M.A.E. Wagenmakers (Eds.) (1998). *Facilitating sustainable agriculture: Participatory learning and adaptive management in times of environmental uncertainty*. Cambridge University Press: Cambridge.

Uphoff, N., et al. (Eds.) (1979). *Feasibility and application of rural development participation: a state-of-the-art paper*. Cornell University: Ithaca, N.Y.

THEME 2: LOCAL INNOVATION PROCESSES

The scholarship and practice in this theme position itself as an alternate paradigm to the Green Revolution-era technology transfer approach. A characteristic practice is Participatory Technology Development (PTD). This refers to a range of mechanisms for enhancing the ability of researchers, extensionists and other service providers and land users to collaborate in developing and spreading improved agricultural practices — with farmers and other land users being given a central role in defining the research and development agenda, and in the planning, implementation and evaluation of activities. The concepts and literature place heavy emphasis on the development and promotion of the PTD approach, which aims to enhance the research and development capacities of farmers and other land users, by acknowledging farmers' own skills and knowledge in articulating challenges and exploring solutions to them. Critical challenges posed by this theme are how to 'institutionalise' or "scale-up and out" the approach.

Espineli, M.B. & Waters-Bayer, A. (2005). Participatory Processes of Developing Performance Indicators in a Global Partnership Programme: The case of PROLINNOVA. Paper presented at the Impact Assessment Workshop Co-organised by PRGA and CIMMYT at CIMMYT Headquarters. 19-21.10.2005.

Keywords: programme monitoring and evaluation (M&E), participation, partnerships, PROLINNOVA.

The article explores programme monitoring and evaluation (M&E) of research with 'participation', 'partnership' and 'learning' dimensions. The authors present M&E within the PROLINNOVA programme, describing the process as an evolutionary one that continuously adapts to the programme's needs. PROLINNOVA is an NGO-initiated programme that facilitates a global learning and advocacy network for promoting local innovation in ecologically-oriented agriculture and natural resource management. PROLINNOVA supports the creation or strengthening of platforms of diverse stakeholders in agricultural research and development to reflect on contemporary approaches, methods and policies; the analysis of how these are promoting or constraining local innovation and participatory innovation development; and the planning and implementation of activities that enhance agricultural innovation. Such platforms (or partnerships) are built at two levels: at the country-level (the programme runs in Niger, Sudan, Ethiopia, Ghana, Uganda, Tanzania, South Africa, Cambodia and Nepal) and international-level (where country-level experiences are shared). The ultimate aim is to strengthen the links between farmers, NGOs, extension, research and other stakeholders in agricultural innovation. The paper focuses specifically on the development of performance indicators for the PROLINNOVA programme, drawing generic lessons for their design in multi-stakeholder processes. These include understanding the key role that M&E can play in creating ownership amongst all stakeholders by building trust and ensuring that no one partner dominates the agenda or operations of a multi-stakeholder programme; and the context-specificity of performance indicators, such that indicators are appropriate for the specific ecological and socio-cultural settings in which multi-stakeholder processes are implemented.

Rees, D.J., H. Okurut-Akol, N. Nangoti, J. Oryokot, J. Okwadi, C. Olaunah, P. Okubal and Imaikorit F. Oum (2004). Enhancing innovation processes through local competitive agricultural technology funds in Uganda: Experiences and lessons learnt. *Uganda Journal of Agricultural Sciences*. Vol. 9. Pp. 103-110.

Keywords: Agricultural research management, funding, R&D resources.

The paper presents experiences with the Client-Oriented Agricultural Research and Dissemination Project, set up by the National Agricultural Research Organisation (NARO) in eastern Uganda. Reflecting the increasingly common practice of allocating public agricultural research and development resources competitively to promote institutional pluralism and partnerships in delivering research services, the project was set up as a pilot by NARO to test locally-governed competitive agricultural technology funds (CATFs) as a means of enhancing innovation through strengthened client-orientation in research and dissemination. The CATFs were designed to increase stakeholder involvement in decision-making, management and allocation processes; enhance the pluralistic provision of research and dissemination services; mobilise under-utilised capacity and infrastructure; increase the use of contractual approaches; and improve accountability to clients. The paper describes project experiences, highlights challenges that have occurred during its implementation, and the means through which these have been addressed. These include attempting to maintain uninterrupted research and dissemination services, ensuring that professionals do not dominate management processes, trying to create a level playing field amongst all potential service providers, developing effective financial management approaches, and developing effective and meaningful communication strategies.

Veldhuizen van, L., Wongtschowski, M. & Waters-Bayer, A. (2005). Farmer Access to Innovation Resources (FAIR): Findings from an international review of experiences. *Prolinnova Working Paper No. 9*.

Keywords: alternative funding mechanisms; farmer access to innovation funds; criteria for establishment; review of experiences.

This document explores one potential way through which Participatory Technology Development/ Participatory Innovation Development (PTD/ PID) can be realised — namely, the establishment and institutionalisation of new funding mechanisms that enable farmers to have more influence over directing the course of research. The document is a review of experiences with such mechanisms, and serves as input into the creation of Local Innovation Funds (LISFs) by PROLINNOVA Country Programmes involved in the Farmer Access to Innovation Resources (FAIR) project. The results of a review of nine international experiences are consolidated in this document, along with their implications for eventual PROLINNOVA LISFs. The reviewed cases mainly concern funding mechanisms related to agriculture and natural resource management (NRM), and those of relevance to small-scale, poor farmers in rural settings. Additionally, a Dutch innovation fund for the horticultural sector was included in the review to draw lessons from a Northern-based experience, as was the City-Community Challenge Fund (C3F), which provides lessons on decentralised design and community involvement in local funds. The review highlighted the strategic choices that must be considered for farmer-controlled innovation funds generally. These include the need to explore the most conducive location for such funds — in existing institutions, new independent institutions, or institutions managed by farmer groups or communities. This leads to a further consideration — should the funds be established at district, regional or national levels? One of the case studies reveals how a national level fund has been successful in setting up good grassroots

linkages, despite expectations. Another example illustrates the advantages of decentralised set-ups (easier access by more marginal groups, simplified and quick screening of proposals, since managers will have intimate knowledge of the individuals, groups, innovations involved, and a better possibility of involving communities in the design and management of the fund). On the other hand, decentralisation may pose problems in maintaining quality in managing the fund, particularly in the screening and selection of applications). Time-frames are also important considerations — most of the reviewed cases provided grants for one or two seasons or years, leading to considerations of the long-term sustainability of activities. A further consideration is whether to target individuals or groups. Group-based approaches have the advantage of being able to pool resources, and collectively form platforms to mobilise broader support for their causes. The reviewed cases used diverse criteria according to which they assessed the proposals that they received. Furthermore, the grants provided by the programmes supported diverse activities, from cross-visits between farmers, research and extension centres to farmer-led experimentation and the involvement of agricultural research and development (ARD) agents. Additional considerations include the composition of proposal review and selection committees, the need and methods to formalise the relationships between grant-giving and grant-receiving organisations or individuals, effective monitoring and evaluation criteria, and the multiple implicit roles of grant-giving organisations. Finally, developing means through which a regular flow of funds can be ensured is essential for the long-term sustainability of innovation funds.

Waters-Bayer, A. & Bayer, W. (2005). The Social Dimensions in Agricultural R&D: How civil society fosters partnerships to promote local innovation by rural communities. Paper presented at the EFARD Conference “Agricultural Research for Development: European Responses to Changing Global Needs”. Zurich, 27-29.4.2005.

Keywords: agricultural innovation, farmer innovation, partnerships, research and extension, civil society organisations, facilitation.

This paper highlights the nature of agricultural innovation as a social process involving multiple actors wherein the diverse motivations, attitudes, behaviours and beliefs of scientists, policy-makers and farmers (the ‘social dimensions’) must be taken into account. Referring to the PROLINNOVA programme as an example, the article outlines how the capacities of resource-poor farmers and the agricultural services that support them can be strengthened by using farmer innovativeness as a guide to articulating development opportunities and research agendas. PROLINNOVA promotes local innovation, stimulates participatory innovation development by farmers, development workers and formal scientists, and seeks to increase the influence of small-scale farmers on decision-making in formal R&D. The paper argues that in line with notions of ‘mode 2 knowledge’, agricultural research can no longer be understood according to scientific criteria of excellence. Rather, an acknowledgement of its socio-economic, cultural and political dimensions is required as well. Furthermore, rural poor tend to inhabit diverse and marginal environments, for which universal technical solutions are inappropriate. The variability in ecological and social conditions demands multiple, local-level innovations. Moreover, for genuine partnerships to exist between formal research and extension services and farmers, the latter must acknowledge the local creativity of the latter. Civil society organisations (CSOs) are seen as playing crucial roles in acting as facilitators and intermediaries in the formation of such partnerships. In the PROLINNOVA

programme, both Southern and Northern CSOs facilitate partnerships, provide learning grounds for various organisations involved in agricultural innovation, and engage in policy dialogue to stimulate institutional change in formal agricultural research, extension and education.

Wettasinha, C., van Veldhuizen, L. & Waters-Bayer, A. (Eds.) (2003). *Advancing Participatory Technology Development: Case studies in integration into agricultural research, extension and education*. Silang, Cavite, Philippines: EER/ETC Ecoculture/ CTA.

Keywords: participatory technology development, institutionalisation, institutional change.

This book takes up the theme of institutionalising participatory technology development (PTD). Its starting point is the rapid increase in participatory approaches in agricultural research and extension projects, and it seeks to address the challenge of integrating these into the day-to-day operations, culture and decision-making of various institutions serving agriculture — including agricultural research, extension, development and education service providers, as well as NGOs, farmer organisations and artisan associations. The book brings together successful experiences of doing so in Africa, Asia and Latin America through 12 case studies. The aim is to encourage sustainable PTD by promoting linkages between research, extension and education with active PTD programmes. One of the most prominent institutional challenges is connecting continuing, conventional R&D efforts led by scientists and extension workers to the emerging PTD activities led by farmers working in collaboration with scientists and extension workers. On the basis of the case studies presented in the book, the authors argue against ‘over-institutionalising’ PTD through excessive formal regulations and formats, which might risk diluting the basic elements of the concept. This implies finding a middle ground between standardising steps and methods, and freedom for room for manoeuvre. While not intending to present a blueprint package for institutionalising PTD, the case studies reveal common sets of activities involved in effective institutional change processes. The authors distinguish institutionalisation efforts from activities aimed at ‘scaling up’ or ‘scaling out’, which they maintain do not ensure that PTD becomes part and parcel of the regular programmes and activities of institutions. This is recognised as being a complex process, which may be hindered by inherent requirements for attitudinal change amongst staff in certain organisations, shifts in power (both within organisations, and within the contexts in which they operate in), the necessity for interdisciplinary work, time commitment to working with farmers, high social skills amongst professional staff, institutional collaboration, and working across entrenched hierarchies. The authors also discuss the multiple dimensions of institutional change (administrative, political and sociocultural), as well as the various factors within organisations that need to be addressed (including mandates and institutional policy development; internal structures and their implications for PTD implementation mechanisms, particularly in terms of creating room for manoeuvre and encouraging participatory decision-making; internal capacities; and staff incentives or disincentives for PTD). Central to stimulating the institutional integration of PTD is creating an organisational culture that is conducive to, as well as establishing financing schemes that will sustain, participatory modes of working as long as necessary.

Further reading on local innovation processes:

Anandajayasekeram, P., Davis, K., Workneh, S. (2007). Farmer Field Schools: An Alternative to Existing Extension Systems? Experience from Eastern and Southern Africa. *Journal of International Agricultural and Extension Education* 14(1): 81-93.

Gottret, M.V. (2007). Rural innovation and smallholders' livelihoods: Modes of intervention in hillside communities of Latin America. *Institute of Social Studies (ISS)*, XVIII, 331.

Huis, A. van, Jiggins, J., Kossou, D.K., Leeuwis, C., Röling, N., Sakyi-Dawson, O., Struik, P.C., & Tossou, R.C. (2007). Can convergence of agricultural sciences support innovation by resource-poor farmers in Africa? The cases of Benin and Ghana. *International Journal of Agricultural Sustainability* 5 (2-3), p. 91-108.

Kaaria, S., Njuki, J., Abenakyo, A., Delve, R., & Sanginga, P. (2008). Assessment of the Enabling Rural Innovation (ERI) approach: Case studies from Malawi and Uganda. *Natural Resources Forum*, Volume 32, Number 1, February 2008, pp. 53-63(11), Blackwell Publishing.

THEME 3: AGRICULTURAL INNOVATION SYSTEMS

The scholarship and (limited) practice in this theme builds on the concept of national systems of innovation and applies to agriculture and rural development. The central concept is that innovation is an evolutionary and interactive social process where networks of diverse knowledge sources combine new and existing information to respond to a dynamic series of challenges and opportunities. The concept recognises that under this process the patterns of interaction are highly context-specific and shaped to a large degree by the institutional and policy setting in which these take place. Learning, institutional innovation and consequent behavioural changes of the system are viewed as the key means and measures of capacity development. Early work on agricultural innovation systems was mainly historical in orientation and tended to position innovation systems perspectives as an alternative to technology transfer/ linear perspectives. More recent work has been focused toward operationalisation of the perspectives and has presented them as a metaphor for the diversity of different ways of organising innovation that do and need to exist. Critics point to the framework's inability to deal with the political economy of knowledge. While much has been written on reconceptualising existing agricultural research and extension activities in the light of this new concept, the key challenge remain in finding ways to operationalise the perspective. Orientating dominates research practice and policy environments remain an uncompleted agenda.

Biggs, S.D. & Matseart, H. (1999). An actor-oriented approach for strengthening research and development capabilities in natural resource systems. *Public Administration and Development*. Vol. 19. Pp. 231-262.

Keywords: research and development capacity building, natural resource systems, planning, monitoring and evaluation, actor oriented approach, actor linkage matrix, determinants' diagram.

This article discusses strengthening research and development capabilities in natural research systems by reviewing predominant planning, monitoring and evaluation

(PME) methodologies and identifying some main areas of concern. The authors take 'research capability' to mean "the sustainability of the research processes influenced by projects, the capacity of local systems to address wider rural development issues such as poverty reduction and environmental conservation, and the ability of research actors to learn and change" (p.231). Such capacity is difficult if not impossible to judge using conventional monitoring and evaluation methodologies, which emphasise short-term and quantifiable outputs. Instead, context-specific indicators based on qualitative analysis are required. Conventional PME research is often narrowly focused on formal research organisations, and tends to pay limited attention to local research capacity and other key research actors (farmers, the private sector and NGOs). Furthermore, these approaches tend not to acknowledge the political nature of evaluation proceedings, failing to recognise for instance the plurality of social and ideological commitments of individuals and interest groups. There tends also to be a lack of integration of the PME approaches with research practice. Finally, conventional PME approaches are unable to take stock of the emerging 'process approaches' in development practice. This implies the need to develop PME tools that can accommodate the increasing flexibility of projects, and their 'learning and re-planning' nature. The authors present an actor-oriented framework, which they believe can be used alongside the conventional log framework approach to improve PME process in projects that aim to develop research capability. The proposed framework enables the holistic examination of multiple research systems, disaggregates key actors and allows for the inclusion of a poverty reduction focus. Within this framework, PME is viewed as a "developmental learning and re-planning process", and aims to enhance the log framework approach by grounding it in the wider political and social contexts of given settings. It builds on two tools — the actor linkage matrix (ALM) and determinants' diagram (DD). The authors maintain that the proposed approach is not limited to the study of information flows and their control within research systems, and can be applied more broadly at the national level, or more narrowly at the level of specific projects. They also outline several advantages of the framework — including its ability to place a project in its wider context, to identify existing strengths, to develop meaningful and observable indicators of research capability, to allow systematic presentation of qualitative information, to cope with the unexpected, and to explore and promote partnerships. The authors maintain that it also transcends pre-existing structures and hierarchies, allows for a poverty focus, is user-friendly, makes assumptions explicit, and allows long-term monitoring and assessment of capability.

Clark N.G. (2001). Innovation systems, institutional change and the new knowledge market: implications for Third World agricultural development. *Journal of the Economics of Innovation and New Technologies*. Vol 11. Issues 4&5. Pp. 353-368.

Keywords: Innovation systems, agriculture, institutional change, developing countries.

This article explores the notion that the rate and direction of technological change is context specific, taking up the theme with respect to agriculture in the South. It argues that understanding the success or failure of agricultural innovation could benefit from adopting an 'innovation systems' standpoint, suggesting that one reason why agricultural innovation does not lead to the expected outcomes could be the inertia of the institutional contexts in which innovation is assumed to take place. The paper begins with an overview of innovation in the agricultural sector in the South, outlining the conventional 'Transfer of Technology' (TOT) model, which has traditionally

guided such efforts, along with the institutionalisation of this model within international agricultural research centres belonging to the Consultative Group for International Agricultural Research (CGIAR) and national agricultural research and extension systems (NARES). The success of this model is questioned both at the international and national level. Reasons for failure are well-rehearsed and include the dominance of a hierarchical system in which farmers have few means of communicating with research centres, which themselves have been largely guided by scientific as opposed to developmental criteria; and the weakness of NARES, which have been ineffective in bridging the gap between farmers and research centres. While the TOT-model may have been effective in ensuring the success of the Green Revolution in some (but certainly not all) rural areas in the South, its appropriateness for addressing the complex challenges that the rural poor are understood to face today is questionable. The author proposes that a 'national innovation systems' perspective might usefully inform the discussion on agricultural innovation in the South. The origins and evolution of this perspective is outlined, with particular emphasis on the importance of connectedness between relevant stakeholders, and the break down of barriers between knowledge search and use. The author further considers information theory within an innovation systems context, suggesting that information flows and the capacity to convert information into useful knowledge is contingent upon a deep and shared understanding of the meaning and relevance of that information amongst both the sender and the recipient institutions. This, in turn, is shaped by internal and external institutional factors. The article concludes that the success of agricultural innovation requires "institutional structures that permit the symbiosis of knowledge search with knowledge use".

Clark, N.G., Hall, A.J., Rasheed Sulaiman V. & Guru Naik (2001). Research as capacity building: the case of an NGO developed post-harvest innovation system for the Himalayan Hills. *World Development*. Vol. 31. Issue 11. Pp.1845-1863.

Keywords: innovation, systems, development, agriculture, post-harvest, poverty.

This article examines an NGO-mediated and international donor-supported post-harvest innovation system mediated by a non-governmental organisation (NGO) in India. The authors describe how the NGO in question was able to establish a complete system of commercial production and sale and within it, negotiate and manage a series of relationships with diverse partners. The NGO had a facilitative role that involved building trust, defusing anxieties and articulating collective goals, which appear to be essential for the long-term sustainability of the system. As part of these efforts, the NGO also focused on understanding the motivations of each stakeholder, and ensuring that the necessary conditions for realizing these existed. The NGO also realised the importance of working through local people and groups to build up rapport and trust with farmers. Furthermore, the NGO's focus on the poorest sections of rural society influenced the patterns of institutional linkages that it promoted. The NGO also showed considerable capacity to learn from past project and build lessons from these into future activities. Overall, the authors conclude that the case study illustrates a new form of innovation system capacity that is relevant to poverty reduction. A critical feature of the system in question was its flexibility to recognise the evolving need for new partners and changing roles. The catalytic role that individuals can play in supporting interventions involving various partners was also highlighted. The trust and shared values and perspectives that existed amongst the diverse partners were believed to avoid powerful partners capturing the process. Furthermore, the case study suggests that instead of trying to promote the

participation of all stakeholders in all tasks, what is more important is that each stakeholder has an appropriate role and that these can be realised effectively. The findings suggest that indicators for new innovation systems capacities include the composition of these systems and the manner in which they evolve; the existence of trust between partners; the recognition of complementary and overlapping agendas; and the clear definition of roles and accountability for these to other partners. The authors reflect the implications of such lessons for donor behaviour, highlighting the changes that were required on the part of the donor programme in questions to support technology development processes as opposed to technology development projects. These included altering its funding arrangements such that control of resources was given to the Indian-based NGO (as opposed to Northern-based individuals or organisations), which had been at a comparative advantage to identify local partners and manage relationships with them. This allowed the NGO to respond more effectively to the local context, and ensure meaningful impacts of the project.

Clark, N., Yoganand, B. & Hall, A.J. (2002). New science, capacity development and institutional change: the case of the Andhra Pradesh-Netherlands Biotechnology Programme (APNLBP). *International Journal of Technology Management and Sustainable Development*. Vol. 1 Issue 3. Pp. 195-212.

Keywords: North-South cooperation; biotechnology; integrated bottom-up approach; institutional change; Dutch development assistance; Andhra Pradesh; India culture of science; NGOs; public research organisations.

This article presents a Dutch development assistance programme in biotechnology — the Andhra Pradesh-Netherlands Biotechnology Programme (APNLBP) — that has adopted a systemic perspective towards knowledge creation and innovation. The programme is an early example of donor-initiated experimentation with novel institutional arrangements that have aimed to bring the benefits of modern science directly to bear on rural development by encouraging the involvement of conventional ‘recipient communities’ in all aspects of the knowledge transfer process. A component of the broader Dutch Special Programme on Biotechnology for Development, APNLBP has relied on an ‘integrated bottom-up’ approach, which centres on creating direct linkages with ultimate user communities, and which aims to stimulate capacity development through a long-term focus on institutional learning and change. The article describes APNLBP in detail, situating it within the context of the broader Dutch Special Programme. It moves on to present the ‘innovation systems’-framework, and subsequently uses this framework to examine various projects that have been run by APNLBP. This reveals a range of institutional changes in agricultural R&D that have occurred through the implementation of the project. The article reflects these changes with the wider context of agricultural R&D in India, highlighting the ways in which this context has influenced processes of transformation. The authors conclude that while some issues remained to be resolved at the time of writing, APNLBP had succeeded in creating space in the sphere of agricultural science for exploring alternative institutional set-ups. It is this flexibility, and ability to adopt different modes of operation in response to specific circumstances, that characterises sustainable innovation capacity.

Hall, A., Sivamohan, M.V.K., Clark, N., Taylor, S. & Bockett, G. (2001). Why research partnerships really matter: Innovation theory, institutional arrangements and implications for developing new technology for the poor. *World Development*. Vol. 29. No.5. Pp. 783-797.

Keywords: agriculture, development, partnerships, innovation, policy, India.

Building on concepts of ‘national innovation systems’, this article argues for the adoption of partnership-based approaches as core means for mobilising science and technology to meet the livelihood demands of the poor. On the basis of two case studies from the agricultural sector in India, the authors highlight the importance of institutional factors in the success of partnerships and innovation processes. The term ‘institution(al)’ is taken to mean both physical organisations and the ‘rules of the game’ of their environments. The first case study shows how prevalent institutional arrangements prevented a private sector growers’ association accessing required, dispersed technical expertise to link farmers to foreign export markets. These arrangements are attributed to, among others, the historical patterns of institutional development in Indian public sector research, and bureaucratic constraints that prevented alternative forms of interaction. The second case study indicates how institutional arrangements have evolved over time to support farmers accessing emergent market opportunities and new technologies. This highlights the dynamic processes of institutional evolution that harnessed the use of technology to encourage economic change, suggesting that while partnerships were important, it was the ability to form and dissolve these in response to particular circumstances that was crucial for the success of the innovation process. The authors go on to argue on the basis of the case studies that underlying technical and economic change in general, and partnerships in particular, are institutional dimensions that conventional quantitative and even the more recent qualitative analyses fail to consider. Instead, they see ‘national innovation systems’ literature as offering a set of principles that can assist in understanding innovation processes in particular contexts, and identifying leverage points for enhancing innovative performance to benefit the poor. Central to such enhanced performance is capacity for institutional learning and change according to adapt to shifting circumstances surrounding agricultural innovation. The authors conclude by stating that ‘national innovation systems’ literature offers a starting point for developing more inclusive approaches to understanding technology development processes within the agricultural sector in the South.

Hall, A. & Rasheed Sulaiman, V. (2002). Application of the innovation systems framework in North-South research. *International Journal of Technology Management and Sustainable Development*. Vol. 1. No. (3) Pp. 182-195.

Keywords: innovation systems, crop post-harvest research, South Asia, pro-poor, institutional learning, partnership, evolving roles, North-South collaboration, action research, DFID.

This article presents the evolution of a development assistance research programme — DFID’s Crop Post-Harvest Programme (CPHP) — in South Asia. As such, it provides an example of institutional learning and change on the part of a donor in order to better respond to emerging understandings of innovation. The article begins with a description of CPHP, situating the features of the programme within the broader setting of DFID’s renewable natural resources strategy. The strategy included exploiting the UK science base in support of international development and using productivity increases in production systems as criteria of evaluation. Initial changes in the strategy began to emerge with DFID’s adoption of a stronger poverty reduction focus in its projects, which manifested itself in attempts to fit research into a more people-focused development paradigm. The authors argue, however, that implementation of projects at this stage remained highly linear, centred on the assumption of transferability of ‘universal’ and ‘codified’ knowledge. It was through a series of technical backstopping projects for the horticultural export sector in South Asia that the importance of the institutional context of research and development

began to receive attention. The need to collectively mobilise diverse stakeholders to reach a mutually beneficial outcome was realised, leading to policy research on the ‘innovation systems’-concept on the one hand, and implementation of its central principles in the management of CPHP on the other. Three case studies of this implementation within CPHP are presented, along with lessons emerging from these institutional experimentations. The paper concludes by discussing the broader implications of adopting an ‘innovation systems’-framework for understanding science and technology-led development in North-South partnerships, stating that instead of traditional top-down ‘transfer-of-technology’-approaches, “initiatives need to be firmly embedded in national stakeholder networks, and technical imperatives need to be supplemented by efforts to build new forms of multi-institutional capacity”.

Heemskerk, W., et al. (2003). *A Guide to Demand-Driven Agricultural Research: The Client-Oriented Research Management Approach (CORMA)*. Amsterdam: Royal Tropical Institute.

Keywords: NARS, institutional change, client-orientation, participation, research management, CORMA, Mali, Tanzania.

This guide charts experiments with institutional change in the NARS of Mali and Tanzania, which aimed at adapting the systems to the new agricultural innovation environment characterised by decentralised and privatised research and extension, and greater client involvement in directing funding and priorities. By the mid-1990s, the NARS in both countries were faced with serious budgetary constraints. Turning their attention away from donors to local clients for funding of research, the systems realised that they were inadequately prepared for a dynamic market wherein clients control funds, and payment is conditional upon delivery of appropriate services. The main obstacles included lack of transparency in financial handling, research priority decision-making, and lack of client-friendly communication of results. As a consequence, the systems embarked upon comprehensive change process, central to which was the development of a research management approach that would ensure enhanced client-orientation of services. This led to the development of the Client-Oriented Research Management Approach (CORMA), outlined in this guide. CORMA is the culmination of a collaborative effort between the Royal Tropical Institute (KIT) in the Netherlands, l’Institut d’Economie Rurale (IER) in Mali, and the Department of Research and Development (DRD) in Tanzania. CORMA goes beyond their periodic, isolated use of participatory approaches and Farming Systems Research techniques in confined research projects, and aims instead to mainstream more systems-like perspectives into NARS through a focus on five management areas — human resource development and management; financial management, development and enhancement of linkages; stakeholder participation and networks planning, co-ordination, monitoring and evaluation; and output production, dissemination and monitoring of impact. The book outlines the development of CORMA, a guide to its design and implementation, as well as preliminary lessons from its implementation.

Heemskerk, W. & B. Wennik (2004). *Building Social Capital for Agricultural Innovation: Experiences with farmer groups in Sub-Saharan Africa*. KIT Bulletin No. 368. Amsterdam: Royal Tropical Institute.

Keywords: agricultural innovation, farmers’ organisations, social capital, sub-Saharan Africa.

This book outlines the implications of the gradual shift towards more systemic conceptualisations of agricultural innovation for farmers’ groups and organisations, arguing that in order for them to fulfil the increasingly stronger role expected of them

in local and national innovation systems, their social capital (the institutions, relationships, attitudes and values that govern interactions among people and contribute to economic and social development; after Grootaert, et al. 2002) must be further enhanced. This must occur at three levels: bonding (within groups), bridging (between groups) and linking (with agricultural service providers). Drawing on experience in sub-Saharan Africa, the book discusses existing social capital amongst farmers' organisations involved in agricultural innovation, its different dimensions, its quality, and the options for various stakeholders to strengthen this. These experiences reveal that throughout sub-Saharan Africa, farmers are increasingly directing research and extension agendas, contracting research and extensions services through de-concentrated innovation development funds or delivering the actual service themselves. The challenge is to support these emerging changes in order to ensure that farmers are given true leverage in steering agricultural research, extension and education according to their own needs.

Heemskerk, W. & B. Wennik (Eds.) (2006). *Stakeholder-driven Funding Mechanisms for Agricultural Innovation: Case studies from sub-Saharan Africa*. Amsterdam: Royal Tropical Institute.

Key words: agricultural research and extension; alternative financing mechanisms; stakeholder participation; institutional innovation; case studies; Tanzania; Benin.

This book takes at its starting point the need for rapid technological, organisational and institutional innovation within agricultural research for development. It focuses specifically on new financing arrangements, which are believed to lead to stronger multi-stakeholder control of the agricultural research and natural resource management agendas, thereby improving the social capital of particularly small-scale farmers and producers. The book traces the emergence of alternative financing arrangements to a decrease in the availability of public sector funding, with donors beginning to channel their funds through the demand side. As a consequence, funds from the private for-profit and not-for-profit sectors are becoming increasingly important. Examples of emerging funding or financing mechanisms include competitive grant schemes, cost-sharing and co-financing arrangements, contract research, as well as full privatisation of service delivery. However, the authors highlight that in order to be successful, such funding mechanisms require extensive institutional innovations including enhanced client-control over priorities and resources, expansion of the range and competencies of service providers, as well as organisational changes within the public and private sectors, as well as farmers' organisations. A challenge faced by the emerging funding mechanisms includes combining enhanced stakeholder participation with long-term sustainability, which is at risk from economies of scale and large overhead costs. The book presents case studies of stakeholder-controlled funding mechanisms in Tanzania and Benin, concluding that the true empowerment of farmers and their organisations in controlling the financial resources for demand-led research and extension is still a long way off, partly as a result of the prevalence of traditional 'top-down' attitudes amongst researchers. More effective mechanisms are still required in order to ensure true ownership of local funds by stakeholders.

World Bank (2006). *Enhancing Agricultural Innovation: How to go beyond the Strengthening of Research Systems*. Economic Sector Work Report. The World Bank: Washington, DC, pp. 149.

Keywords: Innovation systems, development, agriculture, institutional change.

This book — the result of an international workshop organised by the World Bank's Agriculture and Rural Development Department — focuses on the largely unexpected operational aspects of the innovation systems concept and explores its potential for agriculture. It evaluates real-world innovation systems and assesses the usefulness of the concept in guiding investments to support knowledge-intensive, sustainable agricultural development for the Bank's client countries and their collaborators. Using eight case studies of innovation systems around the world — including the case of the pineapple export sector in Ghana and the vanilla production sector in Kerala, India — the book develops a typology of innovation systems, draws up strategies to guide investments for strengthening innovation capacity and identifies concrete options for investment. The authors emphasise the importance of mechanisms for collaboration and interaction. To that end, it develops an operational agricultural innovations systems concept by focusing on additional insights and types of interventions that can be derived from an innovation systems perspective and that can influence the generation and use of science and technology for economic development. The analysis of the eight case studies helps the authors draw the conclusion that linkages for creating dynamic systems of innovation are frequently absent in developing country settings and existing attitudes and practices are major obstacles to innovation. As a result of this, developing country agricultural sectors have limited access to new knowledge, a partial say in research and training, weak organisational learning, sector upgrading and restricted sources of finance for innovation. The book draws the conclusion that in the contemporary agricultural sector, competitiveness depends on collaboration for innovation. It sees a role for the public sector in promoting that collaboration and the need for interventions to build capacity and foster the learning that enable a sector to respond to continuous competitive challenges. These interventions must have a social and environmental sustainability component for economic success and must be inclusive of those actors who are critical for coordinating innovation systems at the sector level but who are generally overlooked or missing.

Further reading from an agricultural innovation systems perspective:

Alsop, R. and J. Farrington (1998). Nests, nodes and niches: A system for process monitoring, information exchange and decision-making for multiple stakeholders. *World Development*. Vol. 26. No. 2. Pp. 249-260.

Chataway, J. Smith, J., & Wield, D. (2007). Shaping scientific excellence in agricultural research. *International Journal of Biotechnology*, Vol. 9, No. 2 pp. 172 – 187.

Chataway, J., & Smith, J. (2006). The International Aids Vaccine Initiative (IAVI): Is it getting new science and technology to the world's neglected majority? *World Development*, Vol. 34, Issue 1.

Davis, K.E., Ekboir, J., Spielman, D.J. (2008). Strengthening agricultural education and training in sub-Saharan Africa from an innovation systems perspective: A case study of Mozambique, *The Journal of Agricultural Education and Extension* 14(1).

Hall, A. & Nahdy, S. (1999) New methods and old institutions: systems problems of farmer participatory research. *Agricultural Research and Extension Paper*. No. 93. ODI.

Hall, A., Clark, N.G., Sivamohan, M.V.K., Sulaiman, R.V. & Yoganand, B. (2001) New agendas for agricultural research in developing countries: policy analysis and institutional implications. *Knowledge, Technology and Policy*.

Hall, A. (2005). Capacity development for agricultural biotechnology in developing countries: an innovations systems view of what it is and how to develop it. *Journal of International Development*. Vol. 17. Issue 5. Pp. 611-630.

Hall, A.J., B. Yoganand, Rasheed Sulaiman, V., Raina, R., Prasad, S., Naik, G. and N.G. Clark (Eds.) (2004). *Innovations in Innovation: Reflections on Partnership and Learning*, ICRISAT, Patancheru, India and NCAP New Delhi, India, 238 pp.

Hall, A., Sulaiman, R., and Bezkorowajnyj, P. (2008). Reframing Technical Change: Livestock fodder scarcity revisited as Innovation capacity scarcity: A conceptual framework, UNU-MERIT and ILRI, ILRI South Asia, Hyderabad

Hall, A.J. (2007). Challenges to Strengthening Agricultural Innovation Systems: Where Do We Go From Here? UNU-MERIT Working Paper 2007-0???. Maastricht: United Nations University – Maastricht Economic and Social Research and Training Centre on Innovation and Technology.

Hall, A.J. (2007). The Origins and Implications of using Innovation Systems Perspectives in the Design and Implementation of Agricultural Research Projects: Some Personal Observations. UNU-MERIT Working Paper 2007-013. Maastricht: United Nations University – Maastricht Economic and Social Research and Training Centre on Innovation and Technology.

Hall, A.J., Clark, N., Naik, G. (2007). Technology Supply Chain or Innovation Capacity?: Contrasting Experiences of Promoting Small-Scale Irrigation Technology in South Asia. UNU-MERIT Working Paper 2007-014. Maastricht: United Nations University – Maastricht Economic and Social Research and Training Centre on Innovation and Technology.

Klerkx, L.W.A., & Leeuwis, C. (2008). Matching demand and supply in the agricultural knowledge infrastructure: Experiences with innovation intermediaries. *Food Policy* 33 (3), p. 260-276.

Mytelka, L.K. (2007). *Innovation And Economic Development*. Publisher: Edward Elgar.

Klerkx, L.W.A., & Leeuwis, C. (2008). Balancing multiple interests: Embedding innovation intermediation in the agricultural knowledge infrastructure. *Technovation* 28 (6), p. 364-378.

Rajalahti, R., Janssen, W., & Pehu, E. (2008). *Agricultural Innovation Systems: From Diagnostics toward Operational Practices*. Agriculture and Rural Development Discussion Paper 38, The World Bank.

Spielman, D., Ekboir, J., Davis, K., & Ochieng, C.M.O. (2008). An innovation systems perspective on strengthening agricultural education and training in sub-Saharan Africa. *Agricultural Systems* 98(1): 1-9.

Sulaiman, R.V. & Hall, A.J. (2002). An innovation systems perspective on the restructuring of agricultural extension: evidence from India. *Outlook on Agriculture*. Vol. 30. Issue 4. Pp. 235-243.

Sulaiman, R.V. & Hall, A. (2002). Beyond technology dissemination: reinventing agriculture extension. *Outlook on Agriculture*. Vol. 31. Issue 4. Pp. 225-233.

THEME 4: INSTITUTIONAL LEARNING AND CHANGE

The scholarship and practice in this area has its roots in attempts to introduce a learning perspective to impact assessments of agricultural research effort, particularly those in the CGIAR. The theme's central argument is that until a learning orientation is introduced prospects for improving the impact of research on poverty reduction are limited. It draws inspiration from innovation systems perspectives, organisation change, positive deviance and knowledge management practice. The theme's mantra is roughly "it not what we do; it's the way that we do it", whereby new research practices and other institutional innovations are seen as the principle means of better achieving mission goals. Self-reflection is pointed to as a way of structuring or routinising learning and developing and legitimising new practices. Practice in this area focuses on developing mechanisms that can facilitate enhanced learning. Key challenges are operational both at the organisational level and at the level of bringing about policy-level changes in the framework conditions of agricultural research, particularly in the international agricultural research arena.

Biggs, S. (2005). Learning from the positive to reduce rural poverty: Institutional innovations in agricultural and natural resources research and development. Paper presented at the Impact Assessment Workshop of the CGIAR's Participatory Research and Gender Analysis (PRGA) programme 19-21.11.2005 at CIMMYT, and at IFAD workshop "Where are the Innovation Challenges for Rural Development?" 15-17.11.2005 Rome.

Keywords: rural development, institutional innovation, agriculture, natural resource management, South Asia, learning from the past, positive deviance.

The paper argues that opportunities for poverty reduction, improved social inclusion, and policy and institutional influence are being overlooked due to a lack of reflection on and learning lesson from practitioners who have been successful in bringing about positive change. The article maintains that despite much critique, development practice remains dominated by a paradigm of development as a linear, rational, problem-solving exercise. The author echoes calls for an alternative approach — based on learning from past, positive experiences — to complement the prevailing development framework. The entry point for development thus shifts from articulating constraints and barriers to change, to describing political and cultural

situations wherein diverse actors are being effective in bringing about desired change. Similarly, conventional practice concentrates on reporting on planned indicators, describing average outcomes and providing explanations (and frequently further perceived problems) of why outcomes fall short of predictions. The author argues that 'learning from the positive' does not dismiss potential lessons from planned interventions; rather, it opens up the possibility of discovering new insights guided by alternative criteria. Three case studies of agricultural and natural resource management experiences in South Asia are presented to illustrate how institutional innovations at macro levels emerged, and led to positive development outcomes. The main lessons of the case studies include the importance of flexible poverty reduction and social inclusion frameworks, and the creativity of practitioners therein; the importance of continuous learning from positive experiences both within the practitioners' own contexts and from parallel circumstances existing elsewhere; the importance of strategic thinking and exploration for new opportunities; and the importance of explicitly acknowledging and addressing "parochial" interests, which the author argues, are omnipresent. The paper concludes by considering the implications of these for innovation theory and rural development practice are discussed.

Hall, A., et al. (2003). From measuring impact to learning institutional lessons: an innovation systems perspective on improving the management of international agricultural research. *Agricultural Systems*. Vol. 78. Pp. 213-241.

Keywords: impact assessment, evaluation, international agricultural research, innovation systems, institutional learning and change.

This article argues that impact assessment studies of agricultural research have fallen short of their expectations because the economic criteria utilised by them are inadequate diagnostic tools to capture the complexity of rural innovation. Specifically, such criteria fail to capture critical institutional lessons concerning how research and innovation as processes could be improved. The article argues that the linear and largely quantitative input-output dimensions of economic assessment must be complemented by analytical frameworks that are able to depict systems of reflexive, learning interactions and their positioning in, and relationship with, unique institutional contexts — features, which characterise emerging, contemporary understandings of innovation. The article proposes that the 'innovation systems'-framework be used to articulate such elements, and presents three case studies of its implementation to such ends. The first case study is an account of 'tacit learning' and institutional experimentation by scientists to develop more effective arrangements in order to realise the outcomes of an agricultural research project. The second case study presents the evolution of an international agricultural research centre's relationship with the private-sector seed industry, and the institutional changes that this entailed for a centre that had traditionally maintained strong boundaries between its activities and those of the private sector. The third case study is an account of how a specific donor programme realised the need to take into account the institutional contexts of the agricultural research activities that it was sponsoring, and how this led to the incorporation of an institutional learning component to its conventional technology-development components. The article concludes by arguing that the 'innovation systems'-framework has much potential for guiding new means of addressing poverty alleviation through agricultural innovation, which entail considering the complex, inter-connected societal and institutional contexts in which such processes are embedded.

Mosse, D. (2001). Process-oriented approaches to development practice and social research. In Mosse, D., Farrington, F. & Rew, A. (Eds.) *Development as Process: Concepts and Methods for Working with Complexity*. New Delhi, India: India Research Press.

Keywords: process monitoring and documentation; development as process.

This paper presents concepts of 'process monitoring and documentation', and is the first chapter of a book, which discusses process monitoring and impact assessment in development projects, inter-agency contexts and policy reform. Process monitoring has emerged alongside a broader shift in development practice from 'projects' to 'process'. The paper attributes this shift to failures of past development approaches and the articulation of new policy goals, and identifies specific and interrelated features of this transformation. Firstly, there has been a move away from narrow, technology-led projects towards a greater emphasis on sectoral concerns (sector-wide reform and strengthening) and cross-sectoral issues (such as, poverty and gender). Secondly, and as a consequence, bounded projects are no longer the exclusive focus of development assistance. Instead, managed networks and inter-agency links and partnerships are central to reaching wider goals of policy change and institutional reform. Thirdly, there has been a move away from externally-planned and technically and managerially prescriptive 'blueprint' approaches in development planning towards more flexible and iterative approaches. This follows prevalent experiences that development solutions often evolve from experimentation and practice as opposed to design. Fourthly, there has been a consequent shift from centralised and 'top-down' approaches towards more decentralised and participatory ones. Thus, understanding development as a process marks a change of focus from project inputs, outputs and the assumed mechanical link between them, towards flexible systems with changeable procedures and approaches. Furthermore, concentrating on development 'processes' accommodates the consideration of contextual and relationship elements present in all projects, which have traditionally been dealt with informally. The term 'process' also incorporates the dynamic, often unpredictable and idiosyncratic elements in development programmes that are not malleable to planning and control, thereby also drawing attention to the range of different stakeholders involved in development, as well as their at times diverging interests. Development has become more concerned with introducing behavioural changes that must be sustained in the long term, and consequently requires new forms of information generation, communication and monitoring performance and impact. Process-oriented approaches involve continuous information gathering over a period of a programme, as opposed to *ex post* evaluations, and concentrate on the present (in addition to the past and the future, which have tended to be the main foci of conventional approaches). Process monitoring is also action-oriented, thus directing outputs to those who are in a position to react to them. Furthermore, process monitoring is inductive and open-ended, thereby challenging the traditional image of development projects and programmes as closed, static, predictable and controllable. Process-oriented approaches tend to be situated outside of project structures and the routine flow of programme activities and information, and tend to recognise that monitoring information itself is an interest-laden activity. This paper is the first chapter of a book, which discusses process monitoring and impact assessment in development projects, inter-agency contexts and policy reform.

Further reading on institutional learning and change:

Cracknell, B.E. (2000). *Evaluating Development Aid: Issues, Problems and Solutions*. Sage: New Delhi.

Hall, A.J., Clark, N.G., Rasheed Sulaiman V. and Taylor, S. (2002). Institutional learning in technical projects: horticultural technology R&D systems in India. *International Journal of Technology Management and Sustainable Development*. Vol. 1. Issue 1. Pp. 21-39.

Horton, D. (1998). Disciplinary roots and branches of evaluation: some lessons from agricultural research. *Knowledge and Policy*. Vol. 10. No. 4. Pp. 32-66.

Horton, D. (1999). Building capacity in planning, monitoring and evaluation: lessons from the field. *Knowledge, Technology and Policy*. Vol. 11. No.4 Pp. 152-188.

Shambu Prasad, C.; Laxmi, T. and Wani, S.P. (2006). Institutional Learning and Change (ILAC) at ICRISAT: A Case Study of the Tata-ICRISAT Project, Global Theme on Agroecosystems, Report no. 19, India: International Crops Research Institute for the Semi-Arid Tropics, 44 pp.

Watts, J., Horton, D., Douthwaite, B., La Rovere, R., Thiele, G., Prasad, S. and Staver, C. (2008). Transforming Impact Assessment: Beginning the quiet revolution of institutional learning and change, *Experimental Agriculture*, Vol. 44, pp. 21–35.

Watts, J., & Horton, D. (2008). Institutional Learning and Change: An initiative to promote greater impact through agricultural research for poverty alleviation. ILAC Working Paper 5, ILAC Initiative, Rome: Italy.

THEME 5: MARKETS, VALUE CHAINS AND INNOVATION

An emerging area of scholarship and practice is addressing the question of ways innovation can be used to improve the stakeholding of the poor in local and global agriculture-based value chains. This theme builds on a large body of work that has explored the political economy of global value chains. It also draws on innovation systems perspectives where technical and institutional innovations, including marketing innovations, are seen to emerge through a co-development process. Much of the existing literature focuses on documenting and drawing lessons from emerging practice and developing tools to aid practitioners. Key challenges remain in understanding the type of policy and incentive regimes needed to promote pro-poor objectives in value chains and associated patterns of innovation capacity.

Best, R., et al. (2005). Building linkages and enhancing trust between small-scale rural producers, buyers in growing markets and suppliers of critical outputs in Almond, F.R. & S.D. Hainsworth (Eds.) *Beyond Agriculture – making markets work for the poor. Proceedings of an international seminar*. London, UK. 28.2.2005-1.3.2005. DFID/ CPHP.

Keywords: Market orientation, small-scale farming; livelihoods development; territorial approach to agro-enterprise development; CIAT; local stakeholder groups; collective articulation of goals and action; enabling environment; role for development organisations.

This paper further develops the notion that market orientation of small-scale farming, particularly in sub-Saharan Africa and South Asia, is central for poverty reduction. The paper maintains that there is increasingly wide-spread consensus of *what* needs to be done to achieve such market orientation, but little understanding of *how* this could be undertaken at the macro- (political), meso- (institutional) and micro-levels (farmer-market). While acknowledging the major inequities in market access that exist at the meso- and macro-levels, the authors argue that the promotion, establishment and strengthening of rural agro-enterprises are central in local and national development, leading to improved household food security, income and employment. The paper identifies a range of challenges to the growth of small-holder agriculture, and highlights examples of smallholder farmers confronting such challenges through systemic approaches, including achieving economies of scale and value addition through collective action as well as incorporating higher-value crops and livestock activities to their production systems. According to the paper, such examples reveal the major changes required for farmers to move from household security orientation towards market orientation in terms of how farmers and their communities interact with each other, and with actors beyond their community level. The authors argue that this transition requires mentoring and orientation from development organisations, access to a range of public and private services, and a set of government policies that support business in remote locations. The paper goes on to propose a “Territorial Approach to Agro-enterprise Development” used by the International Centre for Tropical Agriculture (CIAT), which accommodates such considerations within defined spatial areas. The approach consists of five components: the identification and strengthening of a group of stakeholders with common goals and strategies for rural enterprise development; the identification, management and development of market opportunities available in the region; participatory production to market chain analysis, consensus building with diverse actors along the chain and the design of a shared strategy to increase chain competitiveness; the implementation of collectively selected options; and the identification and promotion of appropriate and sustainable business development services, and regional markets for these services. The entry point for the approach is the identification and consolidation of local interests groups, and during the process, a number of policy and enabling environment-related issues are identified and progressively incorporated into a strategy and plan for action. Central to the approach is the premise that relationships, linkages and trust need to be established among different actors during different stages of agro-enterprise development.

Ruben, R., M. Slingerland & H. Nijhoff (2006). Agro-food chains and networks for development: Issues, approach and strategies in Ruben, R., et al. (Eds.) (2006) *Agro-Food Chains and Networks for Development*. Proceedings of the Frontis Workshop on Agro-Food Chains and Networks for Development. Wageningen, The Netherlands. September 6-7, 2004.

Keywords: Globalisation, international trade, supply-chain integration, network cooperation.

This chapter contributes towards the recent discussion on the potential of agro-food chains and networks in providing access to markets for producers in developing countries, and thus acting as instruments for development. The discussion outlines the main issues at stake in the debate, summarising the implication of globalisation and market liberalisation for the organisation of local and global food chains. These include the rapid growth of supermarkets, the involvement of smallholder producers in these new and more demanding sourcing networks, and their ability to meet the

more stringent food safety and quality regulations inherent in them. The chapter then moves on to present the main principles and approaches that are motivating the paradigm shift towards more integrated and interdisciplinary agro-food chain and network analysis. These include concepts such as supply chains (the transformation processes from inputs through primary production, processing and marketing to the final consumer), filière or sub-sector approaches (systems of agents for producing and distributing goods and services; provides insight into the sequential nature of interconnected activities through the spatial mapping of commodity flows), value chains (the distribution of value-added throughout the supply chain amongst different agents), clusters (the analysis of relations between partners involved in a supply chain within a defined geographical setting; emphasis on vertical linkages), networks (similar to clusters; emphasis on horizontal relationships), netchains (interface of vertical supply chains and horizontal networks) and contracts (defining the rules and obligations for establishing cooperation between network partners and chain agents). The chapter then moves on to discuss the institutional aspects of chain and network cooperation, highlighting the most important trends in supply-chain governance that are relevant for developing countries. These include 'innovation through alliances', which is emerging in response to the demands set by international competition for continuous learning through reorganisation of production processes and network upgrading with strong interactions between design, production and marketing operations. Chains and networks are argued to be relevant in development since they provide access to new and profitable market outlets, timely responses to demands for capacity development and knowledge dissemination through network governance, and chain upgrading through partnerships that increase the size and distribution of value added. The chapter concludes with a consideration of critical factors that enable producers from developing countries to engage in integrated agro-food supply chains (building experience and trust; merging learning and innovation; and sharing benefits and rents), as well as the means through which policy can foster entrepreneurship, co-innovation and cooperation amongst local producer networks and national and international agro-food businesses. The chapter acts as an introduction to a volume providing a comprehensive overview of the current state of art in the field of agro-food chains and networks, and their potential contributions to development.

Sanginga, P.C., R. Best, C. Chitsike, R. Delve, S. Kaaria, & R. Kirkby (2004). Enabling rural innovation in Africa: an approach for integrating farmer participatory research and market orientation for building the assets of rural poor. *Uganda Journal of Agricultural Sciences*. Vol. 9. Pp. 942-957.

Keywords: gender, participatory research, market opportunities, social capital, Africa, natural resource management, scaling up.

Improving the profitability and competitiveness of small-scale farming is featuring prominently in rural development agendas. However, the means through which small-scale farming can be made more market-oriented, and participatory research approaches can be integrated to marketing and agro-enterprise development, remain largely unexplored. This article presents an integrated framework for demand-driven and market-oriented agricultural research and rural agro-enterprise development, termed Enabling Rural Innovation (ERI). ERI builds to participatory approaches to strengthen the capacities of rural communities to identify and assess market opportunities, develop profitable agro-enterprises, and improve production through experimentation while sustaining their livelihoods resources. Focus is placed on integrating the knowledge systems of scientists and farmers, strengthening social

organisation and enhancing entrepreneurial activities through effective partnerships between research, development and rural communities. ERI addresses strategies for promoting gender and equity in the access to markets and technologies, and the distribution of benefits and additional incomes. Drawing on empirical results and lessons learned in implementing ERI in Uganda, Malawi and Tanzania, the article shows that small-scale farmers use diverse economic and non-economic criteria in evaluating market opportunities, which themselves stimulate farmers to explore innovations in practices, crops and local-level institutions. Furthermore, the experiences indicate that building and sustaining meaningful partnerships between research and development organisations, government and private agri-businesses, as well as strengthening necessary human and social capital are necessary in the success of small-scale agro-enterprise development. The article maintains that explicit scaling-up strategies are required to link successful community processes to meso- and macro-level market institutions at the national and regional levels.

Further reading on markets, value chains and innovation:

Batt, P.J. (2004). Incorporating measures of satisfaction, trust and power-dependence into an analysis of agribusiness supply chains. In Johnson, G.I. & P.J. Hofman (Eds.) (2004) *Agri-product Supply Chain Management in Developing Countries: Proceedings of a Workshop*. Bali, Indonesia. 19-22.8.2003. ACIAR

Bernet, T., et al. (2004). The participatory market chain approach. In Gonsalves, J., et al. (Eds.) (2005) *Participatory Research and Development for Sustainable Agriculture and Natural Resource Management. Volume 1: Understanding Participatory Research and Development*. Lima, Peru: CIP & Ottawa, Canada: IDRC

Kaplinsky, R. (2000). Globalisation and unequalisation: What can be learned from value chain analysis? *Journal of Development Studies*. Vol. 37. No. 2. Pp. 117-146.

Kaplinsky, R. (2000) *A handbook for value chain analysis*. IDRC: Ottawa.

Woods, E.J. (2004). Supply chain management: understanding the concept and its implications in developing countries. In Johnson, G.I. & P.J. Hofman (Eds.) (2004) *Agri-product Supply Chain Management in Developing Countries: Proceedings of a Workshop*. Bali, Indonesia. 19-22.8.2003. ACIAR.

THEME 6: SCIENCE AND SOCIETY

This theme of scholarship has a long history of documenting and conceptualising the relationship between science and society. In the development studies arena, questions around the political, economic and power dimension of knowledge have played a prominent role in debates. A practical offshoot of this school of thought was the participatory research movements and its underlying questioning of whose knowledge counts. The theoretical perspectives of this theme have played an important role in the critique area of development practice where knowledge plays a critical role, including the recent re-emergence of innovation practice. The key challenge for the perspective is to provide a viable alternative that can be put into practice. The Shambu Prasad school of thought on this suggests that the way forward is to create opportunities for

more “encounters” between the scientific knowledge community and other knowledge-based communities of practice in civil society.

Belt, J., et al. (2003). *Cultivating a healthy enterprise: Developing a sustainable medicinal plant chain in Uttarakhand, India*. KIT Bulletin No. 350. Amsterdam: Royal Tropical Institute.

Keywords: value chain, stakeholder analysis, medicinal plant sector, Uttarakhand, constraints and opportunities, mobilizing stakeholders, concerted action.

This book provides an example of the use of a value chain approach in the analysis of the medicinal plant sector in Uttarakhand in India. The study stems from a partnership between the Royal Tropical Institute (KIT) in the Netherlands and the Institute of Applied Manpower Research (IAMR) in India, which focused on policy analysis of agricultural diversification in the latter. Medicinal plants were chosen as the case study as a result of their high added value, increasing international demand, and government (both Central and State) interest in strengthening the sector in order to create additional income and employment opportunities. The state of Uttarakhand has shown particular interest in developing the sector as a result of its rich natural supply of medicinal plants, and suitable agro-climatic conditions for their cultivation. The supply chain describes the full range of activities that are required to bring a product or service from its origin through intermediate phases to the final consumer, thereby revealing the linkages between production, trade, processing and consumption. Particular attention was paid to the inter-linkages between different players and their power relationships. Stakeholder analysis complemented the value chain methodology by identifying the main players involved in the chain, and by providing a framework for developing practical means through which different stakeholders could be linked to attain common objectives. The level of coordination and cooperation was reviewed along the value chain, with specific focus on examining whether consumer requirements and needs were effectively communicated throughout it. Relying on an action-research approach, the study aimed to promote the planning and implementation of interventions by relevant stakeholders themselves. Potential constraints to the development of the medicinal plant sector included the near extinction of medicinal plants from forests, overlapping mandates of institutions responsible for the implementation of policies pertaining to the medicinal plant sector, and weak coordination among the different stakeholder involved in the medicinal plant chain. Potential opportunities included enhanced cultivation (as opposed to extraction) of medicinal plants, which if it were to happen on a large-scale, was expected to attract industry to the region and promote exports. Additionally, the formation of an independent Medicinal Plant Board as a coordinative and facilitative organisation amongst government, private sector, research, extension, farmers and civil society, is highlighted as a positive development. The book aims to present the power of a value chain approach in bringing together multiple, inter-linked actors to deliberate over means to address collective challenges.

Leach, M. and Scoones, I. (2006). *The Slow Race: Making Technology Work for the Poor*. Demos pamphlet.

Keywords: Science and Technology, participatory research, technology transfer, poverty, systems, innovation systems, governance, public-private partnership, citizen engagement, risk regulation.

A top-down approach has guided and characterised efforts at poverty reduction through science and technology initiatives. In this report Melissa Leach and Ian Scoones of the Institute of Development Studies argue that innovation should be

citizen-led, with development and use of technology designed around specific local needs. In the context of a race for economic success and a parallel race to find a universal fix for the problems of developing countries, the authors argue that we need a third — a (slow) race to make investment in science and technology work for the poor. Citizens need to be contributors to the success of technology, which means innovation along trajectories that respond to local needs and regulation attuned to local concerns. The paper argues that science and technology policy design must be reconceptualised in “systems terms”, thereby emphasising “networked interaction of multiple actors, public and private, local and national, in processes which initiate, import, modify and diffuse technologies”. Thus, from an innovation systems perspective, the links between these actors are emphasised, enabling them to operate as an effective system and working through issues of funding, marketing, policy and legal frameworks. Seen from this viewpoint, innovation must focus not only on the technology, but also on the social, cultural and institutional relationships that enable this technology to work. The article cites cases in South Asia and Africa that have embraced such an approach successfully, but says the issue of linking local and national processes of innovation with global processes remains a challenge. This raises issues of governance of science and technology, with public sector R&D in developing countries being restricted by issues of shrinking budgets and brain drain and private sector R&D geared to markets where significant profits can be made. Alongside technology investment, the authors argue for investment in processes of participation, consultation and delivery. The question of how to go about ensuring citizen participation in priority-setting is also critical, and the article recommends the setting up of citizen commissions for science and technology futures.

Leach, M., Scoones, I. and Wynne B. (eds.) (2005). *Science and Citizens: Globalization and the Challenge of Engagement*. Zed Press, London and NY.

Keywords: Globalisation, poverty, development, participatory research, HIV and AIDS, politics of knowledge, clinical trials.

Rapid changes in science and technology pose a range of challenges to questions of citizenship. This book reflects on the nature of expertise; the framing of knowledge; processes of public engagement; and issues of rights, justice and democracy. Using case studies covering issues ranging from medical genetics, agricultural biotechnology, occupational health and HIV/AIDS, the volume questions the manner in which citizens both engage with and are constructed by policy processes. It sets out an agenda for analysis and action around confronting mainstream scientific and technical cultures and, in doing so, poses challenges to how citizen participation is often conceptualised in policy discourse. The volume of essays argues for a more robust vision — one that involves understanding citizens as bearers of knowledge and agency, deeply linked to their own identities and cultures, and intertwined with global networks and solidarities.

C. Shambu Prasad (2005). *Science and Technology in Civil Society: Innovation Trajectory of Spirulina Algal Technology*. *Economic and Political Weekly*, October 1, 2005, pp. 4363-4372.

Keywords: Innovation systems, spirulina, technology transfer, civil society, citizen engagement, institutional learning, extension, science and technology, post-harvest processes, interdisciplinary research.

An institutional separation of research from extension has characterised the conventional view of agricultural innovation, with a linear flow of knowledge from “experts” in the scientific field to “non-experts” in civil society. If there is any active

role for civil society to play, it is in the extension or delivery of the technology given to them by outsiders. In this article, the author uses the example of the development and spread of spirulina — a dietary supplement — in India to argue that a civil society-led initiative can balance commercial success with achieving social goals. Significantly, it highlights the need for an institutional transformation of the scientific establishment into learning organisations if they are to focus on development with a pro-poor or human face — by being more in touch with field realities and better able to respond to feedback. Traditional transfer-of-technology approaches to agricultural research, which dominate institutional arrangements, act as barriers to learning. According to the author, the answer lies in being able to recognise the multiple sources of innovation and knowledge and more client-responsive practices. The author uses the case of the Murugappa Chettiar Research Centre (MRC) — a civil society organisation that rooted spirulina algal technology in India — and places it as part of a larger narrative of science in civil society. The example of spirulina algal technology is rare in that it involves an organisation in India being involved in all stages of development of a technology — conception, commercialisation and extension to social sectors. Spirulina emerged as a high-quality food supplement as a result of largescale — and transparent — nutrition studies in India. MRC built on those initial studies and expanded on them with largescale cultivation and commercialisation of the product. Along the way, it modified its operations according to local cost and social conditions, introducing training programmes to teach local village women in plantation methods and distributing kits to villages in order to supplement meager monthly incomes. The organisation also offers to train NGOs around the country in using the technology to improve local nutritional standards while creating employment opportunities at the same time. This article argues against the linear view of innovation that separates research from extension and thereby externalises problems as failures of delivery or extension mechanisms instead of pointers to a more systemic failure in the practice of researchers and scientists. In this case, scientists at MRC appeared to be constantly aware of changing needs at the receiving end of the technology, and were able to modify their research to meet newer expectations. Civil society and science have traditionally seen each other's activities in opposition. There is a technical component to extension and a social one in research. According to the author, formal science needs to recognise the “hidden histories of science” in civil society initiatives and incorporate them as part of the “legitimate” narrative if science has to have a pro-poor human face. For instance, post-harvest innovation processes are characterised by a degree of complexity that conventional R&D arrangements in the public sector have difficulty coping with. Despite being overlooked by policy processes, civil society organisations are active in this domain, and practise science and promote innovations in ways that hold lessons for research policy.

C. Shambu Prasad (2006). System of Rice Intensification in India: Innovation History and Institutional Challenges. WWF-International-ICRISAT Dialogue Project.

Keywords: Innovation systems, System of Rice Intensification, India, extension-led research, grassroots innovation, civil society, policy, agriculture, politics of knowledge.

This article, published as part of the WWF International-ICRISAT Dialogue Project, looks at the evolution of a commons-based agricultural innovation — the System of Rice Intensification in India, to show how a systemic approach to innovation could benefit not just the poor but all the actors in an innovation system. Sustaining

innovation for development requires rethinking the notion of the poor as passive beneficiaries of the products of others' innovation. Recent thinking in development studies and in the literature on innovation points to the need for the poor to be active participants in the innovation process — a view that has independently gained ground through grassroots innovation networks. This, however, requires institutional changes and a reconfiguration of agricultural research that would enable knowledge flows between research and non-research actors. The author presents and analyses the debate through an examination of the case of the System of Rice Intensification (or SRI) in India — an innovation that has evolved quite independently of governmental policies and private sector involvement, but has shown considerable promise in providing innovative pathways to the solution of the connected problems of stagnating rice yields, declining soil fertility and inadequate incomes for rice farmers. According to the author, SRI also presents a strong case for a rethinking of the role of the poor in innovation for development. Debates on transgenic innovations in biotechnology and their potential effect on the poor in developing countries are highly contested and so polarised that credible alternatives that can meet some of the stated objectives of food security and environmental sustainability are often ignored. SRI is one such alternative that has increased rice yields on farmers' fields in over 25 countries and yet does not figure as part of the strategy of several international agricultural research organisations and aid agencies, many of which continue to be sceptical of SRI despite increasing evidence that SRI methods raise the productivity of land, labour, water and capital concurrently. SRI is a system of growing rice that involves principles that are at times radically different from traditional ways of growing rice. It involves the careful transplantation of single young seedlings instead of the conventional method using multiple and mature seedlings from the nursery. SRI spaces rice plants more widely and does not depend on continuous flooding of rice fields, uses lesser seed and chemical inputs, and promotes soil biotic activities in, on and around plant roots, enhanced through liberal applications of compost and weeding with a rotating hoe that aerates the soil. SRI's uptake and spread in India came largely as the result of civil society-led initiatives. According to the author, this is a case of policies having much to learn from practice. Promoting innovation in developing countries for the poor needs not just the best of technology, but also innovations in policy practice. Involving the poor as users in the innovation process, such as SRI, could prevent the emergence of future "innovation divides", as the poor continue to face immense challenges in a rapidly changing global environment.

Further reading on science and society:

Fairhead, J. and Leach, M. (2004). *Science, Society and Power: Environmental Knowledge and Policy in West Africa and the Caribbean*. Cambridge, UK: Cambridge University Press.

Fairhead, J., Leach, M. and Small, M. (2004). *Childhood Vaccination and Society in The Gambia: Public engagement with science and delivery*, IDS Working Paper 218, Brighton: IDS

Fairhead, J. and Leach, M. (forthcoming). Engaging with science? An ethnography of a West African vaccine trial, *Journal of Biosocial Science*, special issue on Anthropology and Public Health.

Melissa Leach and Ian Scoones (2003). *Science and Citizenship in a Global Context*. IDS Working Paper 205. Institute of Development Studies: Brighton.

Scoones, I. (2006). *Science, Agriculture and the Politics of Policy: The Case of Biotechnology in India*, India: Orient Longman.

SECTION 4

MAPPING THE LANDSCAPE OF SYSTEMS STUDIES ON RURAL INNOVATION

This section provides information and contact details of research groups involved in systems studies of rural innovation.

Organisations involved in the systems studies of rural innovation

	Organisation	Theme I	Theme II	Theme III	Theme IV	Theme V	Theme VI
1.	Communication and Innovation Studies Group at Wageningen University (WUR)	✓		✓			
2.	Technology and Agrarian Development Group at Wageningen University (WUR)	✓	✓				
3.	The Capacity Development and Institutional Change (CD & IC) programme at Wageningen University (formerly International Agricultural Centre)	✓		✓			
4.	International Centre for Research in development-oriented Agriculture (ICRA)		✓				
5.	Centre for Information on Low External Input and Sustainable Agriculture (ILEIA)		✓				
6.	ETC Ecoculture and PROLINNOVA		✓				
7.	Royal Tropical Institute (KIT)		✓	✓		✓	
8.	AGRITERRA		✓				
9.	Agri-Pro Focus		✓				
10.	Wageningen University Management Studies Group & Wageningen Expertise Centre for Chain and Network Studies		✓	✓			
11.	Technical Centre for Agricultural and Rural Cooperation ACP-EU (CTA)		✓	✓			
12.	Learning INnovation Knowledge Network (LINK)			✓			
13.	The Forum for Agricultural Research in Africa (FARA)			✓			
14.	The World Bank's Agriculture and Rural Development Department			✓			
15.	The Systems Department and the Development, Policy and Practice (DPP) Department of The Open University in the UK			✓	✓		
16.	Knowledge, Technology and Society (KNOTS) programme at the Institute for Development Studies (IDS) at the University of Sussex						✓
17.	STEPS Centre (with expertise from IDS and the Science Policy Research Unit or SPRU)						✓
18.	International Fund for Agricultural Development (IFAD)		✓	✓			

19.	Institutional Learning and Change (ILAC initiative of the CGIAR)				✓		
20.	CGIAR Systemwide Programme on Participatory Research and Gender Analysis (PRGA) of the CGIAR		✓				
21.	Rural Agro-Enterprise Development at the International Centre for Tropical Agriculture (CIAT) of the CGIAR		✓				
22.	The International Service for National Agricultural Research (ISNAR) at the International Food Policy Research Institute (IFPRI) of the CGIAR			✓			
23.	The Sustainable Markets Group at the International Institute for Environment and Development (IIED)				✓		
24.	Shambu Prasad						✓
25.	Centre for Research on Innovation and Science Policy (CRISP)			✓			

The first part of this section discusses seven organisations, all of which are based in The Netherlands. A comprehensive overview of the historical development of their work is presented. In the second part of this section, brief profiles of organisations and programmes are provided. Most of these were not interviewed face-to-face.

Detailed profiles and historical development

1. Communication and Innovation Studies Group at Wageningen University (WUR)

The Communication and Innovation Studies Chair Group is one of two groups under the Communication Sciences sub-department at Wageningen University. Broadly, the group explores conflict, negotiation and social learning in multi-stakeholder situations; risk communication; system-innovation, transition processes and communication; cross-disciplinary and trans-disciplinary encounters for product development; and institutional aspects of innovation. The group has three main research themes:

- Innovation in Technology and Society: focuses on the co-evolution of technological and socio-organisational change in society at large, with an emphasis on the role of communication in such processes
- Dynamics of Interaction in Everyday Life: examines the micro-strategies and phenomena evident in the everyday construction of meaning through communication. Specific research questions include the construction of credibility in interaction and negotiation; communicative encounters across epistemic boundaries; discourse; social-psychological processes in communication; and intercultural communication.
- Communication and Organisations: addresses organisations and their relationships with their environments. Specific focal points include organisation-environment interaction; networks and governance; inter-organisational and intra-organisational communication; and organisational aspects of innovation.

The group originates from the Department of Extension Education, established in 1964 by Anne van den Ban. Early research concentrated on understanding individual

adoption and decision-making procedures, which led to insights into how different types of messages influence different stages of decision-making amongst different target groups. The research programme shifted away from its focus on messages towards studying the broader range of actors influencing technology-driven agricultural development following the arrival of Niels Röling in 1983. Prof. Röling developed the concept of Agricultural Knowledge and Information Systems (AKIS) as a diagnostic methodology to study this expanded group of stakeholders and their interactions. In 1989, Cees van Woerkum became the new head of the group, and communication in the context of policy design and implementation became the focus, leading to work on interactive processes and communication management.

Wageningen has played a pioneering role in developing a systems outlook on the traditional research-extension-farmer set up since the 1970s through the work of Niels Röling and Norman Long (Rural Sociology). At the time, there was debate between the systems-thinking approach advocated by Röling, and a more anthropology-based, actor-oriented perspective developed by Long, which attempted to demystify various policy paradigms, including the systems paradigm. The systems-work peaked in the 1990's, but became sidelined for a few years as the focus of research moved towards examining cognitive systems and cooperation between social and natural scientists. However, the theme is re-emerging today in the Communication and Innovation Studies Group, chaired by Prof. Cees Leeuwis, who describes the group's current outlook as a 'hybrid' between the early systems- and actor-oriented approaches. Much of the group's work has concentrated on redefining agricultural extension in line with the new agricultural reality and revisited conceptualisation of innovation, as reflected in the group's new name. The point of departure has been the inability of traditional extension agents and their organisations to effectively participate in this new environment. The group has focused on the micro-level dynamics and inter-human processes (namely, learning), which characterise innovation.⁷

While AKIS and RAAKS have contributed to the group's research agenda, it would be inaccurate to consider that its research programme picks up from where RAAKS left off. According to Prof. Leeuwis, AKIS (and to some extent innovation systems-literature) deals with questions of 'what supports technology-propelled transformation'. The Communication and Innovation Studies group has most recently taken as its starting point investigations into 'what is innovation'. Much of participatory technology development (PTD), for instance, has conceptualised innovation as something 'technical', while the group considers innovation to consist of simultaneous and closely linked social and technical change. The group's research is now also starting to move towards understanding how this process can be supported. Prof. Leeuwis points out that the term 'innovation system' itself is used in a variety of ways. For some, it entails rather radical and full-scale system innovation (such as the Dutch Transition to Sustainable Society-project); for others, 'innovation systems' refers to the system that supports innovation (research, extension, education,

⁷ The 'reawakening' of the systems perspective on innovation at the Communication and Innovation Studies Group reflects the widespread attention, which 'systems innovation'-ideas are receiving in the Netherlands. The Dutch government is providing considerable support for the development of innovation infrastructure through the "Dutch Network on System Innovations: Transition to Sustainable Society". This project aims to develop trajectories of institutional learning and change to drive macro-scale transitions towards sustainable energy, agriculture, natural resource management and transport.

etc.); and further still, an ‘innovation system’ can be a socio-technical system itself (such as the social and technical facets of an irrigation system).

The Communication and Innovation Studies group interacts with other groups within the Wageningen community, particularly the International Agricultural Centre (IAC) and the Technology and Agrarian Development (TAO) group. The group also works closely with technical scientists (most PhD students have a technical background), as well as communications specialists. On a more national level, the group’s main collaborators are to be found in the afore-mentioned Network of Systems Innovation (footnote 6). Internationally, the group’s traditional collaborators have included the extension education-groups at various universities. More recent collaborators include the Open University in the UK, as well as the EU-funded LEARN (Learning in Agricultural Research Network) Group. Farming systems practitioners, who themselves are beginning to adopt new approaches, are also collaborators (in particular, members of the International Farming Systems Association).

Further information can be obtained from: Communication and Innovation Studies Group, P.O. Box 8130, 6700 EW Wageningen, The Netherlands or De Leeuwenborch, Hollandseweg 1, 6706 KN Wageningen, The Netherlands, Tel: +31 (0)317 484310, Fax: +31 (0)317 486094, E-mail: office.cis@wur.nl, Website: www.cis.wur.nl

2. Technology and Agrarian Development Group at Wageningen University (WUR)

The Technology and Agrarian Development group positions itself at the crux of science and technology studies and development studies. The group has three main research themes.

1. “Institutional dynamics of science and technology” investigates the interaction between public and private sector research and development, regulation of technology development, the history of scientific and technological institutions, institutional cultures and global networks of science and technology. Projects within this theme include “International expertise in plant biotechnology regulation”, “International and national biotechnology governance” and “Agribusiness and environmentalism”.
2. “Local level-interaction between science, technology and its users” explores the debate on the roles of and interactions between scientific knowledge and ‘local knowledge’, critically examining participatory methods aimed at reconciling so-called ‘high technology’ and ‘low technology’. Projects within this theme include “Participatory approaches and up-scaling”.
3. “Agricultural technologies in extreme circumstances” focuses on the role of agriculture-related technologies in the ‘failure’ and ‘reconstruction’ of rural societies. The main areas of focus are war-torn societies, HIV/ AIDS afflicted regions, and food-security strategies in areas with high economic and political instability. Projects within this theme include “Food security and human rights in post-war reconstruction” and “Ex-combatants and agrarian transformation”.

TAO reflects, what in The Netherlands is termed, ‘beta-gamma’ integration (the integration of natural and social sciences), and the group has been at the forefront of interdisciplinary studies within agriculture-related fields. TAO approaches questions of agricultural and rural innovation using a ‘technography’-approach — a scale-

neutral methodology that takes specific innovations as starting points, and unravels them with respect to the context in which they are embedded. Important in this type of investigation are factors related to local level institutions (as sociological structures), which can either promote or hinder learning and change processes. These include lack of empowerment of women within households, which prevents them from realising innovative ideas. TAO also addresses the means through which local level interactions and innovations link to broader social systems (the ‘Russian doll effect’), where the entry point may be global regulation and governance of technologies.

Being an interdisciplinary group, TAO researchers stem from various backgrounds and build on diverse schools of thought. Throughout the research programme, efforts are being made to link field level innovation experiences to writings in, among others, social psychology, political economy and political ecology, and anthropological traditions based on the works of Mary Douglas and Emil Durkheim. Underlying this research is the aim of connecting sociological insights with innovation processes, and exploring how alternative innovation systems can be promoted.

TAO researchers identify various challenges to the advancement of convergent or integrated perspectives on rural and agricultural innovation. Among these is the lack of true ‘interdisciplinarity’ between various approaches. On the one hand, science and technology are still seen as something completely separate and possibly incompatible with development. On the other, there remains a divide between natural and social sciences. This is manifested in, for instance, the limited extent to which social sciences inform the various paradigms calling for more comprehensive approaches towards agricultural innovation (such as INRM and IAR4D), which tend to still be framed in largely ‘instrumental terms’. In TAO’s research, such issues link back to questions of institutions and their cultures. Much could be gained from integrating such perspectives, but various factors — starting from the funding of agricultural research for development — would need to be addressed.

Further information can be obtained from TAO, P.O. Box De Leeuwenborch, Hollandseweg 1, 6706 KN, The Netherlands, Tel: + 31 317 482 776, Fax: + 31 317 485 616, E-mail: Office.TAD@wur.nl, www.sls.wau.nl/tao

3. The Capacity Development and Institutional Change (CD & IC) programme at Wageningen University (formerly International Agriculture Centre)

The International Agricultural Centre (IAC), a component of Wageningen University in the Netherlands, was primarily a capacity building organisation aimed at promoting sustainable development within the agriculture, food, rural development and natural resources management sectors.

IAC existed for over half a century, working initially under the Dutch Ministry of Agriculture. For the past five years, IAC functioned under Wageningen University and underwent a major change from providing courses for mid-career professionals working in various agricultural sectors, to organisational strengthening in the South. IAC merged with the new Wageningen International in January 2006, and the centre’s expertise was spread throughout Wageningen University.

One of IAC’s themes of activity included Innovation Systems, which it promoted through institutional development, participatory planning, monitoring and evaluation,

as well as through multi-stakeholder processes and societal learning. IAC became involved in multi-stakeholder processes approximately 5 years ago. Its framework was built around IAC staff experiences in trying to work in a multi-stakeholder mode in various sectors in the South, which coincided with the World Bank-supported sector approach prevalent in the late 1990s. Of particular concern in this approach was the means through which productive interactions between diverse stakeholders with potentially conflicting interests could be encouraged.

The starting point for IAC's conceptualisation of multi-stakeholder processes was the premise that current governance mechanisms were inappropriate for the promotion of sustainable development. Market-led mechanisms on the one hand, and state-led top-down bureaucratic mechanisms on the other, had failed to accommodate the pluralist agenda and stakeholders of sustainable development. The notion of 'societal learning' — a means of interactive governance — was proposed as a middle-ground alternative. It referred to the process through which communities, stakeholder groups and societies learn how to innovate and adapt to changing social and environmental conditions. Societal learning goes beyond simple definitions of community participation and group learning. Rather, it encompasses understanding the limitations of current institutions and mechanisms of governance, and "experimenting with multi-layered, learning-oriented and participatory forms of governance"⁸, as demanded by the sustainable development agenda. The need for societal learning and its associated multi-stakeholder processes can be traced back to writings by social theorists such as Beck and Giddens, and notions of reflexive modernity — or responses to the escalating risks of modernity.

Multi-stakeholder processes are practical means through which societal learning can be realised. They enable engagement and coordination across sectors and between public, private and civil society spheres. They allow for expressing and debating different perspectives, evaluating various scenarios and options, taking decisions and implementing actions. IAC's multi-stakeholder processes were rooted in three main theoretical foundations — systems (Bawden⁹ and Checkland¹⁰), learning (Kolbe) and participation (for instance, Uphoff¹¹). These processes are further informed by constructivist notions of knowledge; ideas on human motivation and action; issues of power, social change and conflict in societal learning; as well as governance and democracy. Similarly, various methodologies — such as RAAKS or PRA — (or combinations thereof) form the practical means through which multi-stakeholder processes are implemented. However, a key property of multi-stakeholder processes is their context-specificity — theories and methodologies are mobilised in flexible and non-prescriptive ways depending on the circumstances under consideration.

In 2006, the activities undertaken by IAC were merged into the CD & IC programme. These remain much as is described above. CD & IC activities are divided into five themes — livelihood security and development policy (policy innovation for poverty reduction), sustainable agriculture as a driver for development (new perspectives on

⁸ Woodhill, J. (2005) Facilitating complex multi-stakeholder processes — A societal learning perspective. IAC Working Document. P. 4

⁹ Bawden, R.J. (1998). *The Community Challenge and the Learning Response* New Horizons (World Education Fellowship Australia Chapter) October 98 pp11-21

¹⁰ Checkland, P.B. (1981) *Systems Thinking: Systems Practice* John Wiley Chichester.

¹¹ Uphoff, N., et al. (Eds.) (1979). *Feasibility and application of rural development participation: a state-of-the-art paper*. Cornell University: Ithaca, N.Y.

agriculture as a driver for development), value chains for equitable and sustainable development (implementing standards across value chains and promoting equitable trade), integrated land, water and biodiversity management (understanding natural resources from an ecosystems perspective and developing governance mechanisms to address competing claims on such resources), and innovation and learning processes for societal change (promoting cooperative approaches for institutional change).

Further information can be obtained from Wageningen International, Programme for Capacity Development and Institutional Change (CD&IC), P.O. Box 88, Lawickse Allee 11, Building 425, 6700, AB Wageningen, The Netherlands, Tel: +31 317 495 495, Fax +31 317 495 395, E-mail: info.wi@wur.nl, Websites: www.wi.wur.nl, www.cdic.wur.nl

4. International Centre for Research in development-oriented Agriculture (ICRA)

ICRA was established in 1981 by, what was at the time called, the European Donor Group of the CGIAR (today called EIARD) in response to the increasing commodity and disciplinary specialisation of agricultural research and education for development. The concern was that this would lead to a generation of professionals who were insufficiently prepared for undertaking research at the field-level, and who were unaware of the dynamics and context of small-scale farming. ICRA initially provided training for agricultural researchers from the North and the South, and later incorporated NGO's and farmers' organisations into its activities.

Today, ICRA is supported by France, Germany, the Netherlands, Switzerland and the U.K., and has headquarters in the Netherlands and France. ICRA remains a capacity building organisation, although its approach has evolved from one focused on individual training to supporting institutional change; from core programmes in the Netherlands and France to tailor-made in country-programmes; and partnering with training organisations in the South to strengthen their capacities.

ICRA training programmes were in the past based on a framework of 'Agricultural Research for Development' (ARD). ICRA describes this as a generic paradigm (and not a model or blueprint) for promoting collective action amongst multiple stakeholders in addressing complex issues associated with rural innovation. ARD emerged largely in response to what was seen as the relatively narrow focus of mainstream participatory research approaches, such as PLAR or PRA. ICRA maintains that these have been useful in enhancing interactions amongst local level actors (researchers, extension agents, development practitioners, NGO's and local farmers and their organisations). However, these have tended to lead to too locally developed innovations that are isolated from a wider network, which supports the up-scaling and out-scaling of innovations. In concrete terms, this is often manifested in a lack of connectivity between producers and markets, credit suppliers or policy-makers. ARD attempts to broaden the involvement of stakeholders, issues (policy environment and institutional reform) and scales (local, regional, national and supranational).

ARD has subsequently come to mean 'Action Research for Development' reflecting the contours of the global intellectual debate surrounding rural and agricultural innovation — a distinct shift away from hard systems to soft systems methodology,

along with a broadening of the range of stakeholders and issues that should be considered. The evolution of the ARD framework has been informed by, among others, Farming Systems Research (FSR), Farmer Participatory Research (FPR), Rapid Appraisal of Agricultural Knowledge Systems (RAAKS), Sustainable Livelihoods Approach (SLA), Integrated Natural Resource Management (INRM), International Agricultural Research for Development (IAR4D) and the Territorial Approach to Rural Agro-eco Enterprise Development.

ICRA emphasises the importance of linking the various levels at which rural innovation can be considered. The organisation tries to ensure this holistic perspective through the way in which it implements its training activities today — programmes are no longer attended by individual participants, but rather teams of practitioners who it is hoped will mainstream the lesson from training programmes and stimulate institutional change in their own organisations or countries. Currently, these teams are often composed of ‘national level multi-stakeholder innovation platforms’ (agricultural research organisations, universities, ministries, farmers’ organisations, NGO’s, and the private sector), whose members are middle- or senior-level managers. The teams are introduced to the various ideas on rural innovation, and are asked to consider the various institutional implications of such ideas. Thus, the focus is no longer on ‘the technical’, with institutional issues being considered at the ‘end of the pipeline’; rather, an innovation systems perspective towards examining diverse factors is adopted from the start. The ultimate aim is to assist teams in designing and implementing learning programmes at the local and the national levels to stimulate institutional change. Indeed, ICRA identifies the latter as one of the challenges of transforming the means through which knowledge is mobilised for development. Many institutions continue to reason and operate according to fairly narrow interpretations of their mandates and roles, instead of specific issues and problems. If this attitude is not altered, many of the positive grassroots level experiences will remain isolated.

Further information can be obtained from P.O. Box 88, 6700 AB Wageningen, The Netherlands. Tel: + 31 (0)317 422 938. Fax: + 31 (0)317 427 046. E-mail Secretariat.ICRA@wur.nl. Website: www.icra-edu.org

5. Centre for Information on Low External Input and Sustainable Agriculture (ILEIA)

ILEIA was established in 1984 as an ETC Ecoculture project aimed at facilitating information exchange on farming practices that involved no or marginal external inputs, that built on traditional knowledge and technology, and that involved farmers themselves at the centre of developments. Today, ILEIA continues to collect, analyse and exchange information on the practical field experiences of small-scale farmers in resource-poor regions in the South, and those specifically concerning LEISA (discussed in more detail under the section on ETC Ecoculture). ILEIA separated from ETC Ecoculture in 1998, and became a fully independent organisation in 2002. The organisation is supported mainly by DGIS and SIDA. ILEIA’s readership includes field-level development workers directly interacting with farmers, national governments, NGOs, research institutions and other projects.

ILEIA focuses on information exchange through the publication of its quarterly magazine LEISA. While the organisation is itself not involved in field-level activities,

it shares information on the numerous projects that are taking place. Additionally, ILEIA partners with organisations in Peru, India, Senegal, Brazil and Indonesia in efforts to produce local editions of the LEISA magazine.

ILEIA deals with questions of ecologically-sound agriculture, specifically within the context of development. According to ILEIA, this context itself has evolved since the initiative was launched – the past dichotomies between ‘North’ and ‘South’ or ‘developed’ and ‘developing’ have been replaced by more intricate divisions between the industrialised and small-scale agriculture both in the ‘North’ and the ‘South’. ILEIA takes as its starting point the variety of technical, social, economic, cultural, and institutional issues impacting agriculture within the LEISA paradigm. Recent issues of the global LEISA magazine have focused on post-harvesting (including market considerations) and policy-making questions.

LEISA itself is a comprehensive term encompassing various farming practices, technologies and broader organisational considerations and political processes. It concentrates on finding technical and social options for small-scale farmers to develop their productivity and income in an ecologically sound manner. LEISA makes use of participatory methodologies that build the capacities of local communities to adapt to changing circumstances by combining indigenous and scientific knowledge and engaging in policy advocacy. Its guiding principles include agro-ecology, optimal and low-cost use of local and external resources, indigenous knowledge, participatory learning, planning and action, social justice and cultural integrity, and stakeholder concerted action.

ILEIA does not adhere to notions that either scientific research alone or isolated farmer innovation are the solutions to agricultural challenges in general, and LEISA challenges in particular. However, ILEIA maintains that the current institutionalised agricultural research paradigm does not support the true integration of alternative expertise, and calls for a ‘new type of science’ to emerge. A further constraint to rural and agricultural development identified by ILEIA is the lack of ‘room for innovation’, which is influenced, among others, by intellectual property rights.

Further information can be obtained from PO Box 2067, 3800 CB Amersfoort, The Netherlands. Tel: +31 (0)33 467 3870. Fax: +31 (0)33 463 2410. E-mail: ileia@ileia.nl. Website: <http://www.leisa.info/index.php?url=about.tpl>.

6. ETC Ecoculture & PROLINNOVA

ETC Ecoculture is a research and advisory group supporting the sustainable use of natural resources in securing the livelihoods of rural populations in developing countries. ETC Ecoculture is a member of ETC International, a network organisation with offices in India, Sri Lanka, Peru, Kenya, the United Kingdom and the Netherlands. ETC Ecoculture is part of ETC Netherlands, which also includes ETC Compas (comparing and supporting endogenous knowledge), ETC Energy (with a particular focus on gender), ETC RUAF (Urban Agriculture and Forestry), ETC Advisory Group NL (sustainable agricultural and natural resource development in the Netherlands and Europe), and ETC Crystal (health). ETC International’s core values include the empowerment of communities that seek to build their future on their own knowledge, skills, values, culture and institutions.

ETC Ecoculture fields of work include agro-ecology and farmer innovation, pastoral development, biodiversity management, food security, and promoting local governance and civil society. Its activities and services within these fields involve information brokerage and networking, research, training and coaching, programme and project management, along with short-term advisory work.

Within the field of agro-ecology and farmer innovation, ETC Ecoculture undertakes activities to improve the relevance and impact of agricultural research and extension through jointly devising and adapting participatory mechanisms and approaches that place farmer innovativeness and local capacities at the centre of agricultural and rural developments. ETC Ecoculture has pioneered various alternative paradigms to the Green Revolution-era ‘transfer of technology’ approach, including Participatory Technology Development (PTD) and Low External Input and Sustainable Agriculture (LEISA). Indeed, the organisation was established by a group of development practitioners working in marginalised areas that the Green Revolution had by-passed.

PTD, as articulated by ETC Netherlands and with reference to agriculture and natural resource management (ILEIA 1989; van Veldhuizen, et al. 1997), refers to enhancing the ability of researchers, extensionists, other service providers and land users to collaborate in developing and spreading improved agricultural practices. Farmers and other land users are given a central role in defining the research and development agenda, and in the planning, implementation and evaluation of activities in PTD, although in practice many ‘participatory approaches’ remain largely controlled by development professionals and their organisations. PTD aims to enhance the research and development capacities of farmers and other land users. PTD advocates have emphasised understanding the concept beyond the limits of individual and time-bound projects. According to ETC Ecoculture, PTD can be applied in a very comprehensive manner, depending on the context in question and the facilitators’ interpretation of PTD principles. PTD contributed towards the shift away from research-defined problems and research-designed solutions concerning rural challenges towards acknowledging farmers’ own skills and knowledge in articulating those challenges and exploring solutions to them.

More recently, ETC Ecoculture has been developing the concept of Participatory Innovation Development (PID). PID is a continuation or broadening of the notion of PTD. The main difference between these two is the entry point — PTD starts from a diagnosis of a problem and the design of a solution through participatory methods, while PID starts from an already functioning ‘solution’, or innovation. Additionally, PTD is often regarded as a technocratic approach (although as suggested above, this is debatable). PID tries to avoid this misconception through its emphasis on ‘innovation’ – an explicit focus beyond the technical and including ‘social innovation’ of practices, organisations, institutions (gender, markets, etc.). Overall, both PTD and PID encourage organisations to have greater acknowledgement for local innovations and innovators, and to take part in joint experimentation and learning activities in order to help farmers further develop local innovations, validate the results and/or spread these more widely.

The PID concept is at the centre of the PROLINNOVA-initiative, which ETC Ecoculture facilitates along with its partners. PROLINNOVA was conceived of in 1999 by the NGO Committee for the CGIAR, the French Foreign Ministry and

Northern and Southern NGOs as an initiative to explore how the successes of local, participatory innovations can be up-scaled. Local Country Programmes (currently in Cambodia, Ethiopia, Ghana, Nepal, Niger, South Africa, Sudan, Tanzania and Uganda) generate lessons based on experiences of indigenous innovation and farmer-led experimentation, identifying what has been achieved, how these achievements have been made and what needs to be done to scale up these approaches. In each country, stakeholders design PROLINNOVA programmes according to their analysis and contexts. These experiences are shared with the Global Partnership Programme, which facilitates the exchange of these lessons worldwide. National Steering Committees and International Support Team assist in realising the activities, and an Oversight Group ensures accountability of the Global Partnership Programme to the Country Programmes. The initiative is supported by, among others, IFAD, the World Bank, CTA, and DGIS.

According to ETC Ecoculture, PROLINNOVA can be seen as a contribution towards promoting the role of farmers in agricultural and rural innovation, which despite efforts spanning decades, is still frequently overlooked by research, extension, education and policy-making circles. PROLINNOVA attempts to consolidate the various, often isolated and locally-specific means through which the conventional ‘transfer-of-technology’ paradigm to rural innovation has been challenged. In doing so, PROLINNOVA aims to make the case that agricultural and natural resource management (NRM) research and extension organisations can become more effective if they interact with and support local innovation dynamics. Within PROLINNOVA (and ETC Ecoculture in general), a distinction is made between ‘innovations’ (specific marketing, technical, organisational components of a functioning, effective whole) and ‘innovation’ (the process through which these are generated and brought together).

PROLINNOVA’s specific activities include:

- Stimulating the institutional change amongst agricultural research, extension and education organisations towards cultures that are receptive of farmer-led innovation and experimentation (and towards more facilitative roles in innovation).
- Piloting decentralised funding mechanisms to promote local innovation.
- Stimulating national and regional policy dialogue to favour local innovation.
- Setting up platforms for reflection, analysis and learning about promoting local innovation.

One of PROLINNOVA’s more recent efforts involve the Farmer Access to Innovation Resources (FAIR), which seeks to institutionalise Local Innovation Support Funds (LISF’s) open to innovative farmers to help them further develop nascent ideas and/ or hire service providers (such as extensionists).

Further information on ETC Ecoculture and PROLINNOVA can be obtained from ETC Ecoculture, P.O. Box 64, 3830 AB Leusden, The Netherlands, Tel: +31 33 4326000, Fax: +31 33 4940791, E-mail: ecoculture@etcnl.nl, prolinnova@etcnl.nl , Website: www.prolinnova.net

7. Royal Tropical Institute (KIT)

KIT was established in 1910 as a research and information dissemination institute concentrated on the tropics. Stemming from the Dutch Association of the Colonial Institute, its main thematic areas have been agricultural development, health care and culture. Over the decades KIT has adopted a more systemic mode of operations — KIT has assumed an integrated approach towards organisational change or developing new approaches to intercultural management.

“Development Policy and Practice” is KIT’s department for development cooperation. The department houses groups working on health, education, sustainable economic development, social development and gender equity. The Sustainable Economic Development group currently addresses agricultural innovation through the following three main areas of activity:

1. Business to business: connecting people, values and markets
2. Decentralisation and local governance
3. Service provision for innovation

The “Business to Business” programme aims to strengthen the agricultural and natural resource sector in order to improve livelihoods of rural people in developing countries. The programme harnesses producer-consumer chains in natural resource-based products, and facilitates interaction between producers, trading partners and investors alongside supporting social equity, environmental sustainability and sound economic development. The programme also carries out chain analyses, feasibility studies and impact assessments of business ventures on rural poverty. The project’s services broadly include facilitating institutional change and market development, facilitating change in organisational capacities, and facilitating knowledge exchange and development. Examples of specific activities taking place include “Agricultural diversification in Uttaranchal State, India” (the development of an action plan through multi-stakeholder processes to produce and market medicinal and aromatic plants) and “Sustainable cashew chain in Benin” (bringing foreign-dominated value-adding services in cashew production under the control of farmers in Benin).

The “Decentralisation and Local Governance” programme aims to increase effective governance through supporting democratic decentralisation — that is, the transfer of powers, resources and assets to elected local government structures. The focal points of the programme include decentralised natural resource management, effective rural service provision (such as linkages between local government and specialised service providers), financing, monitoring and evaluation of rural decentralisation, and linking sector planning, local government planning and community planning. Examples of specific activities taking place under this programme include “Supporting evidence-based policy dialogue on rural decentralisation” (KIT’s partners in Benin, Burkina Faso and Mali developed case studies on the practice of decentralisation in rural areas, with particular focus on among others, the influence of decentralisation on land tenure and natural resource management).

The “Service Provision for Innovation” programme supports efforts to improve the relevance of research, extension and education services to the needs of small-scale farmers in their search for new technologies and practices. The point of departure is increasing the influence of farmers and farmer organisations for improving AKIS. The overall objective is to develop methods and tools to improve the effectiveness of all parties involved in innovation processes through, for instance, multi-stakeholder

innovation funds, and public-private innovation partnerships. The programme's focal points include:

- Institutional development; local AKIS development
- Enhancing the role of farmer organisations in agricultural service delivery
- Developing public-private partnerships in agricultural service provision
- Monitoring and evaluating agricultural innovation systems
- Capacity building and coaching in client-oriented local service provision
- Facilitating deconcentration within national agricultural research organisations
- Developing capacity of local agricultural research services
- Researching financing and equity in agricultural service provision
- Supporting change management in agricultural service organisations

Examples of specific projects include “Multi-stakeholder innovation development” (this study tries to identify the factors in multi-stakeholder partnerships that enhance pro-poor rural service delivery, and to develop approaches for capacity building and institutional strengthening), “Dissemination and up-scaling of the client-oriented research management approach” (enhancing the management aspect of the Farming Systems Approach through the creation of Client-Oriented Research Management Approach (CORMA), which empowers farmers and stakeholders while facilitating institutional change) and “Quality management in service delivery organisations” (developing new approaches for monitoring and evaluating organisational and institutional change in the service delivery sector).

CORMA is one of KIT's contributions towards recent approaches that aim to enhance stakeholder participation in setting the agricultural research agenda. CORMA initially emerged from experiences with agricultural research centres, and to date has focused less on the agricultural innovation system itself. However, a broader perspective can be obtained by integrating CORMA within frameworks such as the Agricultural Science and Technology Innovation (ASTI) system being developed by KIT, CTA and UNU-INTECH, along with contributions from CAB International (CABI) and the Free University of Amsterdam. Furthermore, CORMA is gaining relevance outside of the original agricultural research scene, and has been applied in the analysis of the role of farmer organisations in agricultural innovation.

According to KIT interviewees, issues similar to ‘innovation systems’ are being addressed by approaches based on ‘supply networks’ (which themselves have evolved from ‘supply chains’). Examples of KIT's activities in this area include the study on the medicinal plant chain in Uttaranchal. Indeed, one of KIT's main activities today is the development of ‘T-shaped innovation framework’ — the integration of commodity chains (vertical) perspectives with agricultural innovation systems (horizontal) perspectives. This is a joint activity between programmes 1 and 3 described above, along with KIT's external partners (for instance, the Agricultural Commodity Chains group at Wageningen University). Additionally, KIT is involved in examining the roles of farmer organisations (and looking at mechanisms through which benefits can be secured for farmers), as well as how to make innovation systems socially inclusive (through particular funding mechanisms and new means of monitoring and evaluation).

Further information can be obtained from P.O. Box 95001, 1090 HA Amsterdam, The Netherlands. Tel: + 31 20 568 8458. Fax: + 31 20 568 8444. Website: <http://www.kit.nl/>.

Brief profiles

AGRITERRA is an amalgamation of various rural people's groups in the Netherlands that cooperates directly with their counterparts in Africa, Asia, Latin America and Central and Eastern Europe. The organisation engages in information sharing, providing ICT support for its members and partners, analyses of producer organisations (Profiling of Producers' Organisations) in efforts to promote institutional strengthening, participatory policy-oriented research to support internal and external policy processes of organisations, and strengthening the financial basis of producer organisations. Further information can be obtained from: P.O. Box 158, 6800 AD, Arnhem, The Netherlands. Telephone: +31 (0)26 4455445. Fax: +31 (0)26 4455978. E-mail: agriterra@agriterra.org . Website: <http://www.agriterra.org>

Agri-Pro Focus is a network involving the Dutch government, representatives of the financial and business sectors, as well as research, development and agricultural organisations aimed at the sustainable strengthening of producer organisations in developing countries. Agri-Pro Focus acts as a service broker, matching the needs of producer organisations with the capabilities of its members, as well as a knowledge platform through which experiences and information about producer organisations can be shared. Agri-Pro Focus is involved in three main areas: product and service chains (supporting specific agricultural sectors, such as the cotton or coffee sectors); organisational strengthening as part of capacity building (strengthening the capacities of the producer organisations themselves); and support processes (activities that improve the implementation of projects, such as development of a specific advisory practice geared towards producer organisations). Further information can be obtained from: P.O. Box 108, 6800 AC, Arnhem, The Netherlands. Telephone: +31 (0)26-3542074. Fax: +31 (0)26-3542070. E-mail: info@agri-profocus.nl. Website: <http://www.agri-profocus.nl/index.php?folder=about&content=about> .

Wageningen University Management Studies Group & Wageningen Expertise Centre for Chain and Network Studies. These two groups carry out research in chain and network science, with a particular focus on innovation and internationalisation. The former concentrates on two research themes: Innovation and Transition in Chains and Networks, and Internationalisation of Chains and Networks. The latter carries out projects in, among others, Sustainable Agro Food Chains. Further information can be obtained from: Management Studies Group, Hollandseweg 1, 6706 KN, Wageningen, The Netherlands. Tel: +31 (0)317 484160. Fax: + 31 (0)317 485454. Website: <http://www.mst.wur.nl/UK/>. Wageningen Expertise Centre for Chain and Network Studies, P.O. Box 88, 6700 AB, Wageningen, The Netherlands. Tel: +31 (0)317 495333. Fax: +31 (0)317 495395. E-mail: wageningencns@wur.nl. Website: http://www.wageningencns.wur.nl/index.php?option=com_content&task=blogcategory&id=21&Itemid=79&lang=UK.

Technical Centre for Agricultural and Rural Cooperation ACP-EU (CTA) develops and provides services that improve access to information for agricultural and rural development, and strengthens the information capacity of ACP countries in this area. Its activities include providing an information products and services and enhancing awareness of relevant information sources; supporting the integrated use of

appropriate communication channels and intensifying contacts and information exchange, particularly amongst ACP countries; and developing ACP capacity to generate and manage agricultural information and to formulate information and communication management strategies, including those relevant to science and technology. These activities build on methodological developments in cross-cutting issues and the findings from impact assessments and evaluations of ongoing programmes. In 2004, CTA partnered with UNU/ INTECH to devise a methodological framework for analysing the agricultural science, technology and innovation systems (ASTI) in ACP countries. CTA and UNU/ INTECH provided training and technical backstopping in the application of the framework in Cameroon, Jamaica, Kenya, Papua New Guinea, Senegal and South Africa. Further information can be obtained from: Postbus 380, 6700 AJ Wageningen, The Netherlands. Tel: +31 (0) 317 467100. Fax: +31 (0) 317 460067. E-mail: cta@cta.int. Website: <http://www.cta.int/>.

LINK An initiative of United Nations University-Maastricht Economic and social Research and training centre on Innovation and Technology (UNU-MERIT) and the Food and Agriculture Organisation (FAO), **Learning INnovation, Knowledge (LINK)** advances understanding of rural innovation in developing countries by generating concepts, lessons and guidelines and by facilitating discussions amongst scholars, policymakers, development investors and practitioners dealing with rural development. With a presence in South Asia, East Africa and West Africa, the LINK network of regional hubs bring together local clusters of researchers, policymakers, and development organisations. The hubs are linked through UNU-MERIT to the international community of scholars and policy experts working on innovation policy studies in developing countries. Further information can be obtained from the LINK Secretariat, 8-2-608/1/2, Karama Enclave, Banjara Hills Road No-10, Hyderabad-500 034, INDIA, Phone: +91 (0) 40-66108-111, Fax: +91 (0)40 -233-008-44, E-mail: info@innovationstudies.org. Website: <http://www.innovationstudies.org/index.html>

The Forum for Agricultural Research in Africa (FARA) is an umbrella organisation consolidating key stakeholders in agricultural research and development in Africa. Its activities include advocacy and resource mobilisation, facilitating access to knowledge and technologies, promoting regional policies and markets, strengthening human and institutional capacity, along with catalyzing and facilitating partnerships and strategic alliances. FARA has adopted an innovation systems approach towards supporting agricultural research for development. FARA is coordinator of the **Sub-Saharan Africa Challenge Programme (SSA CP)**. One of the driving forces behind the SSA CP has been the recognition that agricultural research efforts in Africa have struggled to become translated into development outcomes. Committed to departing from the conventional research-led, technology pipeline approach of mobilising science and technology for agricultural development, the SSA CP has adopted an ‘Integrated Agricultural Research for Development’ (IAR4D) framework to guide its activities. The IAR4D framework is described as more comprehensive, acknowledging the diversity of stakeholders involved in innovation, the intricate connections between innovation and its contexts, and the importance of joint learning processes to design appropriate interventions. Among its activities, the SSA CP aims to better understand innovation as a systemic process and to draw lessons for improved delivery of benefits for end-users. Further information:

FARA Secretariat, PMB CT 173 Cantonments, Accra, Ghana. Tel: +233 21 772823 or 779421. Fax: +233 21 773676. Website: <http://www.fara-africa.org>.

The **World Bank's** Agriculture and Rural Development Department, along with its South Asia Agriculture and Rural Development Department, recently collaborated with the United Nations University – Maastricht Economic and social Research and training centres on Innovation and Technology (**UNU-MERIT**) to operationalise the innovation systems concept in the analysis of and interventions in agricultural sectors in developing countries, and to explore how the innovation systems concept might improve investments in agricultural innovation in such settings. The collaboration produced a book – **Enhancing Agricultural Innovation: How to go beyond the strengthening of research systems** – which took as its point of departure the rapid and radical changes that are occurring in the agricultural sectors of developing countries. These necessitate a re-assessment of the strategies that have guided investments in science and technology for agricultural development. One of the main conclusions is that, paradoxically, while in the cases studies research was rarely a driver of innovation, a critical weakness in innovation capacity was nevertheless the poor integration of research organisations into the networks of activity needed to sustain a continuous process of innovation.

The **Open University (OU)** in the United Kingdom hosts the Innovation, Knowledge and Development (IKD) Centre, which brings together among others the OU's **Systems Department** and its **Development, Policy and Practice (DPP) Department**. The former focuses on the study and application of systems concepts pertaining to diverse spheres, including social, ecological and environmental contexts, as well as computing and networking technology. The department is a component of the Centre for Complexity and Change at the Faculty of Technology, and consists of two groups. Of these, the Open Systems Research Group applies and develops systems thinking and practice to the study of complex, interconnected issues, particularly in sustainable development and information systems. DPP, in turn, has three focal points of research: innovation and international development; knowledge capabilities and human development; and governance, management and sustainable development. DPP's activities in these areas extend to agricultural and rural issues. Further information can be obtained from Faculty of Technology, Open University, Walton Hall, Milton Keynes, MK7 6AA, United Kingdom. Website: <http://technology.open.ac.uk/>

The recently established **Knowledge, Technology and Society (KNOTS)** research programme at the **Institute for Development Studies (IDS)** at the University of Sussex focuses on understanding and influencing institutions and power-knowledge relations across local and global scales that frame the link between technology, ecology and society. Its aim is to connect technological change in health, agriculture and the environment more effectively to poverty reduction and social justice. The group's research addresses these three sectors through five cross-cutting themes: knowledge and expertise (examining the changing relationship between different sorts of expertise), institutions and regulations (exploring how institutions might respond to dynamism and uncertainty); access and entitlements (investigating processes that enable or constrain poor people's access to technologies, products and services, and their ability to make effective use of them), politics and policy (examining the policy processes through which technological and ecological issues are addressed and the

knowledge and power relations involved in these), and citizen engagement and mobilisation (exploring different forms of citizen engagement in technology development and applications, and the scope for more effective approaches). The team leader is Dr. Melissa Leach. Further information can be obtained from Oliver Burch (team administrative co-ordinator) at O.Burch@ids.ac.uk or +44 (0)1273 678667 or KNOTS/ IDS, University of Sussex, Brighton, BN1 9RE, United Kingdom. Tel: +44 (0)1273 606261. Fax: +44 (0)1273 621202/ 691647. Website: <http://www.ids.ac.uk/ids/KNOTS/index.html>.

The **University of Sussex** also houses the newly set up **STEPS centre**, which brings together expertise from both **IDS** and the **Science Policy Research Unit (SPRU)**. Describing itself as a research and policy engagement hub, the Economic and Social Research Council (ESRC)-funded STEPS aims to tackle two main challenges: fostering linkages between environmental sustainability, livelihoods and health, and science and technology for poverty reduction and social justice. STEPS has three interlinking domains of activity: food and agriculture, health and disease, and water and sanitation. Its research is organised into three themes: designs, governance and dynamics, which further cut across the domains through projects in crops, urbanisation, epidemics, regulation and risk. STEPS has adopted a ‘pathway approach’ towards its activities, which acknowledges the complex, non-linear relationships between social, technological and environmental systems. The activities of the STEPS centre and the KNOTS research programme are highly synergistic. Further information can be obtained from STEPS Centre, Institute of Development Studies, University of Sussex, Brighton, BN1 9RE, UK, Tel: +44 (0)1273 876808, Fax: +44 (0)1273 621202 or 691647, E-mail: steps-centre@ids.ac.uk.

The **International Fund for Agricultural Development (IFAD)** is a specialised financial institution of the United Nations, which supports agricultural development projects focusing on food production and associated structural challenges. The organisation is running an “**Initiative for Mainstreaming Innovation**”-programme (**IMI**) between 2005 and 2007 aimed at strengthening IFAD’s capacity to promote innovation for poverty reduction by adopting a ‘systemic’ approach towards its activities. The organisation hosted a conference titled “What are the innovation challenges for rural development?” in November 2005, which addressed, among others, the nature of innovation processes in rural settings in the South, the role of IFAD therein, as well as the appropriate means of their evaluation. Further information on the conference can be obtained from Anita-Kelles-Viitanen at a.kellesviitanen@ifad.org. Further information on IFAD can be obtained from Via del Serafico 107, 00142 Rome, Italy Tel: + 39 0654591. Fax: +39 065043463. E-mail: ifad@ifad.org. Website: <http://www.ifad.org/>.

The **Consultative Group for International Agricultural Research (CGIAR)** hosts various initiatives, which address issues at the forefront of current thinking on rural innovation. These include:

The **Institutional Learning and Change (ILAC)** initiative promotes organisational learning and institutional change within the CGIAR in order to improve the impact of agricultural research for development. Having established the foundation for the initiative, its upcoming phase (2006-2009) will focus on further developing the theoretical and conceptual understanding of ILAC; strengthening capacity for

individual and communal learning in planning, monitoring and evaluation activities, and in partnerships, networks, alliances, inter-centre initiatives and system-wide and eco-regional programmes; and knowledge sharing. The ILAC website (<http://www.cgiar-ilac.org/index.php?section=1>) contains a wide range of resources on institutional learning and change, including reports of the five pilot projects that were ran by the initiative, as well as briefing papers outlining central concepts and methods for ILCA. Further information can be obtained from Jamie Watts (ILAC Project Leader). IPGRI. Tel: +39 06 6118253. Email: J.watts@cgiar.org.

The **CGIAR Systemwide Programme on Participatory Research and Gender Analysis (PRGA)** develops and promotes methods and organisational approaches for gender-sensitive participatory research on plant breeding and on management of crops and natural resources. PRGA collaborates with international and national agricultural research institutes, non-governmental organisations and academic institutions to support the formation of partnerships with the rural poor, with an emphasis on the involvement of women. PRGA's thematic activities cover Participatory Plant Breeding, Natural Resource Management, Gender Analysis, Impact Assessment, and Mainstreaming. PRGA hosted an Impact Assessment Workshop in October 2005 to discuss the implications of the emerging ways in which CG Centers design and implement research for impact assessment. Background information on, as well as the papers presented at this workshop are available from <http://www.prgaprogram.org/IAWFTP/IA%20WEB/index.htm>. Further information on PRGA can be obtained from Apartado Aéreo 6713, Cali, Colombia. Tel: +57 2 4450131. Fax: +57 2 4450073. E-mail: prga@cgiar.org. Website: <http://www.prgaprogram.org/index.php>.

Rural Agro-Enterprise Development at the **International Centre for Tropical Agriculture (CIAT)** promotes sustainable linkages between small-scale farmers and growing markets by developing methodologies, tools and models of institutional organisation for establishing and strengthening rural agro-enterprises and their complementary support services. Its research is built around five modules that integrate essential elements for rural agro-enterprise development, and include marketing, post-harvest technologies, business organisation, integrated agro-enterprise projects and local support systems, as well as training and strategic alliances. Its approach relies on the concept of 'Learning Alliances' – that is, multi-stakeholder processes through which good practice in research and development is identified and adapted to existing and future needs and contexts. The project is led by Dr. Shaun Ferris. Further information can be obtained from Apartado Aéreo 6713, Cali, Colombia. Tel: +57 2 4450131. Fax: +57 2 4450073. E-mail: ciat@cgiar.org. Website: <http://www.ciat.cgiar.org/agroempresas/ingles/index.htm>.

The **International Service for National Agricultural Research (ISNAR)** programme at the **International Food Policy Research Institute (IFPRI)** has a **mandate that** concentrates on “improving the capacity to conduct scientific research, promote collective action, and managing information to foster innovations for the benefit of vulnerable social groups in developing countries”. ISNAR activities are divided into four research programmes. The Agricultural Science and Technology Policy programme analyzes data on investments in, and national policies on, agricultural R&D, and investigates factors that inhibit or enhance the performance of agricultural science and technology. The programme on Institutional Change in

Agricultural Innovation Systems, in turn, explores the influences of wider social and economic contexts on innovation processes, the means through which interactions among innovation stakeholders can be fostered, and the effect of innovation policies on poverty reduction and value-addition in agriculture. Organisation and Management for Strengthening Agricultural Research-programme targets managers and decision-makers with tools to enhance the quality of organisations involved in innovation. Finally, the Learning and Capacity Strengthening-programme carries out learning and distance-education programmes in agricultural innovation and development policy analysis. Further information can be obtained from IFPRI, 2033 K Street, NW Washington, DC 20006-1002, USA, Phone: +1 202-862-5600, Fax: +1 202-467-4439, Email: ifpri@cgiar.org

The **International Institute for Environment and Development (IIED) Sustainable Markets Group** aims to ensure positive market contributions on social, environmental and economic outcomes by focusing on re-governing markets – that is, catalyzing civil society, public sector and private sector action to frame markets that work for sustainable development. Its activities are divided into six thematic areas: Business and Sustainable Development (investigating how corporate responsibility can best contribute to sustainable development and the kinds of public policy and civil society interventions that are needed to support it), Market Structure (examining the implications of changing market structures, and analysing the contribution of both large companies and small producers to sustainable development along with the appropriate policy interventions that will enhance the sustainable development impact of both), Environmental Economics (policy-relevant analysis of the economics of sustainable development to improve understanding of the challenges and opportunities at local, national and international levels and to influence design and implementation of solutions), Trade and Investment (investigating policies that influence trade in developing countries, specifically in sustainable products, as well as exploring sustainability impact assessment, and leverage points for responsible investment), Tourism (examining the contribution of tourism towards poverty reduction and sustainable development), and Mining Minerals and Sustainable Development. Further information can be obtained from IIED, 3 Endsleigh Street, London WC1H 0DD, United Kingdom. Tel: +44 (0) 20 7388 2117. Fax: +44 (0) 20 7388 2826. E-mail: info@iied.org. Website: <http://www.iied.org/SM/index.html#7>.

The **Research Into Use (RIU)** programme, launched by the UK's Department for International Development (DFID) in 2006, aims to improve access to and the mobilisation of existing natural resource knowledge and technology for poor people. It explicitly aims to 'stimulate innovation systems', or processes by which new and existing knowledge can be put into practice. The programme envisions this to involve strengthening the capacity for users to articulate their knowledge demands, developing responsive information markets, and exploring innovative ways of supplying the required information. The programme builds on DFID's previous work under its Renewable Natural Resources Strategy (RNRRS), which ran from 1995 to 2006. The aim of RIU is to learn how to mobilise that knowledge on a larger scale. RIU describes this as a 'twin challenge' — promoting actual scaling up, and learning about the process in so doing. Contact details: Research Into Use, NR International, Park House, Bradbourne Lane, Aylesford, Kent ME20 6SN, UK

Additionally, various research and development organisations and programmes provide links to **participatory research** efforts taking place globally. As mentioned previously, while the focus of this exercise is not on participatory research *per se*, the issue is clearly relevant in the context of systems perspectives on rural innovation. Extensive links to such programmes can be found, for instance, on the following **University of Hohenheim** site: <http://www.uni-hohenheim.de/i430a/links/pr-links.htm>; the following **International Development Research Centre (IDRC)** site: http://www.idrc.ca/en/ev-85105-201-1-DO_TOPIC.html; and the following **PRGA** site: http://www.prgaprogram.org/modules.php?op=modload&name=Web_Links&file=index&req=MostPopular&ratenum=10&ratetype=num.

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