Innovation challenges, constraints and opportunities for the rural poor

Background paper

Nigel Poole with Chris Penrose Buckley
January 2006
Innovation challenges, constraints and opportunities for the rural poor

Nigel Poole

With Chris Penrose Buckley

January 2006
FOREWORD

Innovation is the theme of the 2006 Governing Council, in recognition of the importance of innovation to the successful achievement of the Millennium Development Goals and poverty eradication. With the resources from the United Kingdom’s Department for International Development (DFID), implementation of the IFAD Initiative for Mainstreaming of Innovation started in February 2005. IFAD’s Action Plan for Development Effectiveness also focuses on innovation.

IFAD has a key role to play in supporting efforts by developing countries to reduce poverty and promote sustainable livelihoods. The achievement of these goals requires not only doing more and improving existing programs, but also doing things differently. Innovation plays a key role in this.

IFAD commissioned two rural development experts to write background papers exploring new challenges and opportunities as well as identifying innovative rural development practices, interventions, institutions, partnerships and processes to address these new challenges.

Dr. Nigel Poole’s paper explores and appraises the latest practices in innovation. He also draws upon presentations made in the recent IMI Innovation Workshop held on 15-17 November 2005 in Rome. Workshop participants included researchers and project staff, as well as representatives of NGOs, farmers’ organisations, regional development organisations and UN agencies.

We trust that this paper together with Dr. Julio Berdegué’s paper and the accompanying Issues Paper, will provide the basis for a fruitful and thoughtful discussion on innovation challenges for rural development and the kind of challenge this poses for IFAD.

Gunilla Olsson
Director, Policy Division
IFAD

THE AUTHOR

Nigel Poole is senior lecturer at Imperial College London, University of London, United Kingdom. His research centres on the management and commercialization of natural resources; agri-food market systems and institutional analysis; environmental pollution and public and private food safety standards. He has experience in the socio-economic development of Latin American indigenous communities, as well as research experience in several other regions of the world. His work has addressed policy and research agendas of government departments such as the Department for International Development (DFID) of the United Kingdom. He holds a PhD in Agricultural Economics from the University of London, United Kingdom; an MSc in Agricultural Economics from the University of London; an MSc in Agricultural Extension from the University of Reading, United Kingdom; and a BSc in Agricultural Sciences from the University of Nottingham, United Kingdom.

The opinions expressed in this paper are those of the author and do not necessarily reflect official views or policies of the International Fund for Agricultural Development, except as explicitly stated.
LIST OF ACRONYMS AND ABBREVIATIONS

ADB    Asian Development Bank
ATMs   Automatic Teller Machine
AUREOS Private equity fund management company providing capital to small and medium sized enterprises in emerging markets
BP     British Petroleum
CDC    Capital Partners (formerly named Commonwealth Development Corporation)
CDR    Complex, diverse and risk-prone agriculture
CELETEL Communication network which delivers services in Africa
CEO    Corporate Europe Observatory
CGIAR  Consultative Group on International Agricultural Research
CIAT   International Center for Tropical Agriculture
CIP    International Potato Center
DAC    Development Assistance Committee
DCs    Developed Countries
ECOWAS Economic Community of West African States
ERI    Enabling Rural Innovation
EU     European Union
FARA   Forum for Agricultural Research in Africa
F&V    Fruits and Vegetables
FLOSS  Free/Libre and Open Source Software
FOs    Farmer Organizations
GBS    General Budget Support
GC     Governing Council
GIS    Geographical Information Systems
GM     Global Mechanism
GR     Green Revolution
GSM    Global System for Mobile Communications
GTC    Grameen Telecom
HIV/AIDS Human Immunodeficiency Virus/Acquired Immune Deficiency Syndrome
ICT    Information and Communications Technology
IEE    Independent External Evaluation
IFDC   International Fertilizer Development Center
IFI    International Financial Institution
IFPRI  International Food Policy Research Institute
ILAC   Institutional Learning and Change
IMI    Initiative for Mainstreaming Innovation
IPRs   Intellectual Property Rights
IRR    International Rate of Return
IT     Information Technology
ITK    Indigenous Technical Knowledge
KACE   Kenyan Agricultural Commodities Exchange
LDC    Less Developed Country
MALS SWITCH One of the Malawi projects on ICT infrastructure
MATF   Maendeleo Agricultural Technology Fund
MDGs   Millennium Development Goals
MISTOWA Market Information Systems for Trader Organizations in West Africa
NARS   National Agricultural Research System
NEPAD  New Economic Partnership for African Development
<table>
<thead>
<tr>
<th>Acronym</th>
<th>Full Form</th>
</tr>
</thead>
<tbody>
<tr>
<td>NFRE</td>
<td>Non-Farm Rural Economy</td>
</tr>
<tr>
<td>NGC</td>
<td>New Generation Cooperatives</td>
</tr>
<tr>
<td>NGOs</td>
<td>Non Governmental Organizations</td>
</tr>
<tr>
<td>NORFUND</td>
<td>Norwegian Investment Fund for Developing Countries</td>
</tr>
<tr>
<td>NTFPs</td>
<td>Non-Timber Forest Products</td>
</tr>
<tr>
<td>OECD</td>
<td>Organisation for Economic Co-operation and Development</td>
</tr>
<tr>
<td>OIBM</td>
<td>Opportunity International Bank of Malawi</td>
</tr>
<tr>
<td>OXFAM</td>
<td>Oxford Committee for Famine Relief</td>
</tr>
<tr>
<td>PEAP</td>
<td>Poverty Eradication Action Plan</td>
</tr>
<tr>
<td>PMA</td>
<td>Plan for the Modernisation of Agriculture</td>
</tr>
<tr>
<td>PMCA</td>
<td>Participative Market Chain Assessment</td>
</tr>
<tr>
<td>PPPs</td>
<td>Public Private Partnerships</td>
</tr>
<tr>
<td>PRAIA</td>
<td>Regional Programme in Support of Indigenous Peoples of the Amazon Basin</td>
</tr>
<tr>
<td>PRSP</td>
<td>Poverty Reduction Strategy Paper</td>
</tr>
<tr>
<td>R&amp;D</td>
<td>Research and Development</td>
</tr>
<tr>
<td>RESIMAO</td>
<td>Réseau des Systèmes d’Information de Marché de l’Afrique de l’Ouest</td>
</tr>
<tr>
<td>RoR</td>
<td>Rate of Return</td>
</tr>
<tr>
<td>SA</td>
<td>Structural Adjustment</td>
</tr>
<tr>
<td>SADC</td>
<td>Southern African Development Community</td>
</tr>
<tr>
<td>SF</td>
<td>Strategic Framework</td>
</tr>
<tr>
<td>SIBTA</td>
<td>Sistema Boliviano de Tecnología Agropecuaria</td>
</tr>
<tr>
<td>SMEs</td>
<td>Small and Medium-Sized Enterprises</td>
</tr>
<tr>
<td>SNA</td>
<td>Social Network Analysis</td>
</tr>
<tr>
<td>STDs</td>
<td>Sexually Transmitted Disease</td>
</tr>
<tr>
<td>SWAP</td>
<td>Sector-Wide Approach</td>
</tr>
<tr>
<td>TK</td>
<td>Traditional Knowledge</td>
</tr>
<tr>
<td>TPC</td>
<td>Third Party Certification</td>
</tr>
<tr>
<td>UK</td>
<td>United Kingdom</td>
</tr>
<tr>
<td>UN</td>
<td>United Nations</td>
</tr>
<tr>
<td>UNCTAD</td>
<td>United Nations Conference on Trade and Development</td>
</tr>
<tr>
<td>UNEP</td>
<td>United Nations Environment Network</td>
</tr>
<tr>
<td>USAID</td>
<td>United States Agency for International Development</td>
</tr>
<tr>
<td>VP</td>
<td>Vice-President</td>
</tr>
<tr>
<td>WIPO</td>
<td>World Intellectual Property Organization</td>
</tr>
<tr>
<td>WR</td>
<td>Warehouse Receipt</td>
</tr>
<tr>
<td>WTO</td>
<td>World Trade Organization</td>
</tr>
<tr>
<td>WWF</td>
<td>World Wildlife Fund</td>
</tr>
</tbody>
</table>
Table of contents

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>LIST OF ACRONYMS AND ABBREVIATIONS</td>
<td>iii</td>
</tr>
<tr>
<td>EXECUTIVE SUMMARY</td>
<td>1</td>
</tr>
<tr>
<td>INTRODUCTION</td>
<td>6</td>
</tr>
<tr>
<td>1. UNDERSTANDING INNOVATION</td>
<td>8</td>
</tr>
<tr>
<td>2. CHALLENGES FOR THE RURAL POOR</td>
<td>19</td>
</tr>
<tr>
<td>3. OPPORTUNITIES</td>
<td>32</td>
</tr>
<tr>
<td>4. DEVELOPMENT AND INNOVATION</td>
<td>45</td>
</tr>
<tr>
<td>REFERENCES</td>
<td>51</td>
</tr>
<tr>
<td>APPENDIX</td>
<td>63</td>
</tr>
</tbody>
</table>
Executive summary

Context and scope

This paper has been prepared for IFAD towards the end of the current Strategic Framework (2002-2006) with the aim to enhance the effectiveness of IFAD’s contribution to meeting international commitments to the Millennium Development Goals (MDGs). The paper is to serve as an informal background document for the coming IFAD Governing Council meeting (15-16 February 2006). The organisational context is the Initiative for Mainstreaming Innovation (IMI), the framework for which was agreed in December 2004, and the Independent External Evaluation (IEE) (April 2005), one finding of which is particularly relevant in this context, namely that ‘IFAD should … become a more systematic promoter of innovations that could be scaled up and replicated by others’.

IFAD’s mission is to work towards enabling the rural poor to overcome their poverty by:

- strengthening the capacity of the rural poor and their organisations;
- improving equitable access to productive natural resources and technology; and
- increasing access to financial services and markets.

‘Focus’ and ‘prioritisation’ are now key challenges in addressing directly the needs of the IFAD constituency. There is also potential for enhancing IFAD’s indirect role in promoting innovation through policy and advocacy via its international partners.

The scope of the terms of reference which appear in the Appendix is very broad, and coverage of the report within the limits of time and space leaves gaps in discussing the challenges and opportunities for pro-rural poor innovation. The report has four principal sections: 1) understanding innovation in the context of the rural poor; 2) challenges for the rural poor; 3) opportunities for innovation for and with the rural poor; and 4) a concluding section which draws out suggestions for IFAD to consider in developing an innovation policy and an entrepreneurial approach to service delivery.

Understanding innovation

At its simplest, innovation means novelty, new things being done, or old things being done in new ways. A more formal definition is the application of technological, institutional and human resources and discoveries to productive processes, resulting in new practices, products, markets, institutions and organisations that are improved and efficiency-enhancing. A simple model of the process involves recognition of need, articulation of demand, design of the innovative solution, implementation, replication, and upscaling, the latter stages of which in particular have entrepreneurial characteristics.

Innovation in agriculture and rural enterprise has happened for millennia through chance and through the informal but purposive action of rural people seeking new and better ways of production and organisation. Rural people themselves, therefore, have been a major source of new knowledge and practices – indigenous knowledge and organisation. Small-scale farmers’ own creative responses continue to be important sources of improvement to agricultural productivity in many regions of developing countries.

The process and rate of agricultural research and innovation were accelerated by the formal application of scientific methods in the relatively advanced economies in the 18th and 19th centuries.

mandate was developed in the last century for agricultural research and development within public sector organisations, together with the philanthropic activities of private charitable foundations, which led to the development of formal national research systems in advanced and developing countries, and to the formation of international organisations such as those that make up the CGIAR system.

There has been a limited, slow and incomplete convergence of informal farmer innovation with the research efforts of formal systems, and with mixed results. The Green Revolution is conventionally viewed as an output of public sector research, but has also been interpreted as a classic example of a farmer-first participatory methodology. That it was also the result of a fortuitous conjunction of resource availability, timing, demand growth, and active policy support, draws attention to the wider economic and policy context within which challenges are perceived and opportunities exploited.

Although huge financial resources have been expended on formal agricultural research and development, many poor people in remote and less-favoured regions have not benefited from technologies developed for resource-rich areas, especially where government policies have been unsupportive. Moreover, formal research processes have been dominated by a top-down public sector model, without embracing the potential contribution of indigenous knowledge. Beneficiary participation in setting and implementing the research agenda has been difficult to achieve effectively.

Innovation is now seen to come from multiple sources of research and be diffused through multiple extension processes, within given historical, political, economic, agroclimatic, and institutional contexts. The increasing rate of technological change has led to the emergence of platform technologies towards the end of the last century such as ICT and biotechnology. This highlights the opportunities for rural innovation and enterprise by the creative activity of private sector firms in non-rural sectors.

Deep participation, if not ownership, by beneficiaries is essential at some or all stages of the innovation process. The systems approach captures the critical elements: multiple sources of innovation; the need for participation of the rural poor as actors and in setting the research agenda according to local conditions; and networks of partnership with governmental and non-governmental organisations, and with commercial players. The complex and interactive nature of problems presented by the current challenges to rural societies, outlined below, suggests that external resources increasingly need to be brought to bear on rural problem solving, in partnership with other stakeholders, at each stage of the innovation process. Only by surpassing the repetitive cycles of narrow economic evaluation and by adopting a systems learning perspective will agricultural and rural innovation systems find better ways to fulfil their economic and broader social purposes, and thereby help to achieve the MDGs.

Challenges for the rural poor
The principal challenges for the rural poor can be grouped under the headings of political, economic, social, and environmental factors. Causation is complex, the effects are not always negative, and out of the challenges there arise opportunities. Four principal challenges have been addressed: globalisation and barriers to entry into competitive international markets; labour markets; international development policies; and climate change. Significant issues in the health and social arena and in physical infrastructure have been addressed only parenthetically.

Globalisation is associated with a range of technological changes in information systems and in the production, transformation and distribution of goods and services. Globalisation has many homogenising tendencies, but the impacts are by no means ubiquitous or even:

- the advantages of globalisation such as cheap, effective information systems are not equally available to the rural poorest;
- improvements in transportation and communications infrastructure are homogenising global demand and increasing the level of competition in product markets; however, the rural poorest
are those least endowed in terms of essential physical and social infrastructure to be able to take advantage of these opportunities;

- increasing industrial concentration in the supply of agricultural inputs and services, in the purchase, manufacture and processing of rural raw products, and in the distribution channels of products to final consumers – in particular, the spread of the supermarketing phenomenon – are major factors affecting rural producers;

- increasing market competition and the proliferation and globalisation of health and safety concerns and social responsibility are increasing the business, ethical and environmental standards, increasing entry barriers, and worsening the terms of trade between poor rural areas and principal markets.

Paradoxically, changes in the economic and social factors within many consumer environments and the homogenisation of demand also create countervailing tendencies for differentiation and specialisation, and therefore open up identifiable commercial opportunities, which rural areas of developing countries may have unique or competitive advantages in serving. Better organisation of the supply chain to achieve the necessary scale and to attain the necessary skills can overcome the entry barriers raised by globalisation. Opportunities are likely to exist in many local and regional products, commodities and in some international markets.

The growth in the extent of labour markets at regional, national and international levels creates economic opportunities of major importance for the rural poorest, notably through income generation and remittances. However, the effects of migration on the rural poor are complex: for example, reducing population pressure in marginal regions can be advantageous for sustaining environmental resources, but can also lead to generational dislocation, and the loss of human capital and traditional social support systems. The gender dimensions are particularly complex. The challenges are comparable in type to those presented by the health and social effects of HIV/AIDS which this paper does not specifically cover. The principal point to be highlighted is the complexity of the social, economic, environmental and technical interactions, which need deep and focused analysis.

The consensus around harmonisation, coordination and standardisation of development policy and practice is still much contested. Dispassionate analysis is necessary to understand whether the IFAD constituency of the rural poorest are likely to be represented in and benefit from the ‘Consensus’ in terms of policy formulation and development practices. The unfolding challenges suggest that support for the rural poorest must be targeted for local conditions and people. Notwithstanding the intentions to embrace a participative dynamic, the harmonisation of the ‘international aid architecture’ has characteristics of a blueprint approach.

Climate change poses perhaps the greatest threat to life on earth, and will have significant developmental consequences for all countries and economies. Effects on poor regions in developing countries are likely to be most marked. Both institutional and technological responses will be needed to the challenges of climate change, but the willingness of the international community to address these challenges is highly uncertain. Adaptation will be an important strategy in developing countries but awareness of the local challenges is limited. Adaptation has to be specific to context, and therefore will require close attention of all stakeholders, including research to develop indicators of change, projections of likely impact, and alternative strategies to orientate agricultural systems in general.

Opportunities for innovation

The UN Millennium Project has identified practical strategies to eradicate poverty by scaling up investments in infrastructure and human capital while promoting gender equality and environmental sustainability. The thrust is to focus on ‘platform’, or generic, technologies that have broad application or impacts in the economy, and these are identified as information and communications technology (ICT), biotechnology, nanotechnology and new materials. Much of the Project report is consistent with this paper, such as the focus on an innovation systems approach. There is a need for a
‘watching brief’ for developments in these three areas, and a deliberate approach to the identification of important innovation thrusts that can be adapted and adopted by and for the rural poor.

Five areas of innovation opportunity that are highlighted in this paper are information technology for specific purposes; continued support for agricultural systems research and enterprise development; energy; and the regulatory environment.

New information technologies offer important applications, such as Geographical Information Systems (GIS), for resource mapping and monitoring, management and forecasting that can improve targeting, increase agricultural productivity, and enhance biodiversity conservation and natural resource management. New ICTs are already having a significant effect by integrating people in developing countries into information markets and systems – but the poorest are least likely to benefit. The most viable and enduring results are coming from private sector initiatives and the entrepreneurial responses of poor people themselves. Where ‘projects’ are envisaged to overcome the failure of markets, extreme caution will be needed in order not to repeat the historical failures of public sector market information systems. Extending the market by pushing the ‘envelope’ of commercial viability will be more effective than costly public sector- or NGO-led initiatives that the private sector eschews.

As noted earlier, many of the agricultural production innovations that have boosted LDC agriculture in the past 40 years have not benefited the rural poorest. There is still scope, therefore, for investments to improve agricultural output and productivity in many marginal areas, although care must be taken to focus research into areas of productivity growth that do not simply result in surpluses that reduce prices and returns to smallholders. A radical approach is to stimulate poverty-oriented research by private companies through competitive public contracts to achieve specific outcomes. Respecting and building on indigenous knowledge is critical for partnership and sustainability, inter alia, and likely to be of particular value to rural peoples in areas which retain a rich biodiversity. Technical advances in agricultural techniques have important potential to ameliorate the effects of climate change also, and meet some of the demographic challenges posed by migration and HIV/AIDS.

Participatory and market-oriented innovation involves diagnostic research including all stakeholders, identification of potential business opportunities, and the development of market innovations such as new products, technologies and institutions. A conscious process is needed to link innovation systems to market opportunities for diverse commodities and products in local, regional and international markets. Opportunities are likely to exist in the non-farm rural economy, requiring development of post-harvest enterprise and innovation in rural institutions and organisations.

Satisfying rural energy needs within economic and environmental constraints is both a challenge and an opportunity. The provision of energy is one means of improving the quality of life of rural peoples. In addition to the economic benefits, the social and environmental benefits of new energy services other than petroleum products are obvious. Both local scale ‘appropriate technologies’ and developments in more sophisticated technology such as solar energy and fuel cells will be beneficial.

Finally, unwise regulation, and over-regulation, are responsible for the formalisation of markets, low productivity, corruption and unemployment, and reduced fiscal resources. Nevertheless, the response to wrong regulation is not ‘no regulation’ but ‘right regulation’, maybe even preferably ‘self-regulation’. Rural enterprises and economies may need protection through selective industrial policies at the local level. As markets grow, unfettered market exchange is unlikely to be equitable. Targeted, even decentralised, competition policy could serve as a type of ‘shark net’, by constraining the exercise of monopoly power or other coercive forces that may be anti-poor.

**IFAD innovation policy and service delivery**

The report ends with reflections on the need for innovative thinking regarding development policy and donor-engagement. To reach the rural poor, key pointers for IFAD to consider are:
From livelihood assets pentagon to hexagon: embrace broadly defined ‘culture’ as a critical livelihoods asset;
Learning: organisational learning should be enhanced by analysis of success stories;
Identification: mapping the rural poor and understanding the heterogeneity of poverty;
Focus: rural development strategies should be targeted towards specific and local conditions;
Flexibility: funding instruments should be flexible and focused on local scale constraints;
Evaluation: performance should not be measured solely or primarily by economic criteria;
Targeting: targeting the poorest involves higher transaction costs in the identification of the poorest, and in the monitoring and evaluation of portfolio which includes smaller, specialised projects;
Longer time-frames: longer timeframes are needed to permit development to occur;
Risk: risk-taking in innovation-support policies is likely to increase the failure rate as well as the chances of successful innovation;
Upscaling and replication: specificity means that there may be limited economies to be gained in upscaling, and the result of a sharpened focus is that replicability of successful interventions is problematic, and the requirement for upscaling and replicability needs to be addressed with careful analysis;
Field presence: in-field staff and expertise are required;
Policy inconsistency: conflicting tendencies between a standardising ‘international development architecture’ and the need for focused, flexible responses to context-specific challenges and opportunities defined by rural poorest.

There are organisational, management and human resource implications, and also some ideas to contribute to a new operating model. There is considerable importance to delivering complementary business and human development services alongside the financial support. There is a significant, indirect, advocacy role to catalyse the provision by the private sector, and coherent provision by the national and international public and NGO sectors, of services that fall outside the IFAD remit. IFAD can be an advocate among international organisations, a catalyst for the private sector, and a means of dialogue with non-governmental organisations.

Delivery of services at field level within a more entrepreneurial approach needs consideration of greater in-country capacity and field knowledge. Competitive tendering for financial resources is an element of that needs further and more widespread testing. Where competitive funding systems are appropriate, it will be necessary also to consider how to support those who fail in the tendering process. The appropriate balance of loans and grants may need to be considered further, especially if consideration were given to another novel idea, equity financing. By this means, a financial institution provides capital in return for a share in ownership and profits, and some level of management, of a new venture. Equity investment may provide an innovative and appropriate incentive and monitoring structure for staff within IFAD in identifying needs and potential solutions. Equity investment may boost direct engagement between IFAD and its client base through enhancing organisational participation, commitment, and technical and business support.
Introduction

Origins and purpose of the report

This paper has been prepared towards the end of the current Strategic Framework (2002-2006) with the view that there are major challenges, constraints and opportunities for the rural poor and for IFAD in attaining the organisation’s strategic objectives and in making effective IFAD’s contribution to meeting international commitments to the Millennium Development Goals (MDGs). According to Båge (2005) the development community is facing failure with respect to the MDGs because there has been less attention given to rural development in recent years and there are fewer resources. The paper is an input towards the process whereby the Fund will seek to maximize the direct impact of its programmes by focusing on critical poverty bottlenecks and broadening the catalytic effects of its activities.

According to the report of the Director of the Office of Evaluation as Supervisor to the Independent External Evaluation (IEE) (April 2005), three main findings have implications for IFAD’s future performance. In the context of this paper, one finding is particularly relevant, namely that ‘IFAD should … become a more systematic promoter of innovations that could be scaled up and replicated by others’. The other findings concern the need for a new operating model and strengthening governance to oversee development effectiveness.

The quest for a more innovative approach to the new IFAD strategy is developed at some length in the Final Report Annex 4, and Comments of the IEE Senior Independent Advisors. The IEE acknowledged that the Initiative for Mainstreaming Innovation (IMI), the framework for which was agreed in December 2004, ‘will help contribute to capacity development. The approach should involve more risk with greater attention to learning from and disseminating results. This implies a more discriminating management of government and non-governmental partnerships and the strategic use of grants where risks are significant’. This would appear to apply as much to field operations as to the central (particularly human) resource management. The IMI is being reinforced by donors to try to capture previous innovation – to upscale, replicate, share, and capture innovation.

Scope

The scope of the issues that fall under the heading of this paper is immense. The ToR were reduced at the outset. In searching for lessons, the geographical coverage aims to be broad. There is a focus on arable agriculture and therefore less consideration of issues relating to livestock, fisheries, coastal communities, forestry, water and health. Critical to most innovations is human capital and organisational capacity building. Specific training and education initiatives in these areas have not been considered, although broad approaches – innovation systems – embrace individual and organisational learning. The importance of financial markets is only touched on. Gender and age issues permeate all questions to do with rural development and innovation, but are not considered separately. Population factors and social changes are considered briefly in the context of the impacts of migration, but have much broader significance; similarly, attention is drawn to climate changes but again these will have much broader significance. Most of all, the challenges presented by HIV/AIDS have not been covered specifically, and will impact on much of the discussion.

There are complex interactions among the challenges and opportunities. Much is yet to be discovered and understood. A watching brief is necessary in areas beyond the IFAD remit. The challenges are

---

dynamic, as are the opportunities – witness the growth of ICTs and nanotechnology - and consider the hitherto unknown possibilities.

The IFAD constituency: targeting the rural poor

IFAD is directed towards ‘helping the world’s poorest’ (International Fund for Agricultural Development, 2005). Its mission is to work towards enabling the rural poor to overcome their poverty – as perceived by the poor themselves – by fostering social development, gender equity, income generation, improved nutritional status, environmental sustainability and good governance. IFAD aims to concentrate its investments, research and knowledge management efforts, policy dialogue and advocacy on the attainment of three strategic objectives:

- strengthening the capacity of the rural poor and their organisations;
- improving equitable access to productive natural resources and technology; and
- increasing access to financial services and markets.

Attention to the differing opportunities and constraints of women and men, and to sources of vulnerability and ways of increasing resilience are overarching concerns. Lending is specifically aimed at assisting the poorer sector of the rural population— small farmers, artisanal fishermen, rural poor women, landless workers, rural artisans, nomadic herdsmen and indigenous populations — to increase their food production, raise their incomes, improve their health, nutrition, education standards and general well-being on a sustainable basis. Nine major areas are supported:

- agricultural development
- financial services
- rural infrastructure
- livestock
- fisheries
- capacity-and institution-building
- storage/food-processing/marketing
- research/extension/training
- small and medium scale enterprise development

Targeting requires considerable effort and in recognising differentiation among the rural poor, who can be highly heterogeneous (Poole, Gauthier, & Mizrahi, 2005; Wakwabubi, 2005). The poorest are the most difficult and costly to identify (Greeley & Rabeya, 2005). Often they are the most difficult to reach because they are excluded from community meetings for reasons of age or gender or other social characteristics, or the need to attend to other conflicting responsibilities such as household duties, employment or other critical productive tasks. At least, there is a need to distinguish, inter alia,

- the welfare support cases, who cannot be helped in agricultural development, and who may need long-term safety nets, integration into labour markets, emigration from rural areas, or other means of exit from agriculture;
- those who fall (temporarily) into the welfare category but who can be commercially viable given appropriate support;
- those rural entrepreneurs who have growth potential, given appropriate support, that may differ from the above category.

The programme now finances research in a wider range of sectors and involving a much greater diversity of research topics and institutions (IFAD, 2003). ‘Focus’ and ‘prioritisation’ are now key challenges in addressing the needs of the IFAD constituency. The Evaluation also recognises the potential for enhancing IFAD’s role in promoting innovation through policy and advocacy via its partners and co-sponsoring the CGIAR system.
Structure of the report

After this introduction, the report has four principal sections: 1) understanding innovation in the context of the rural poor; 2) challenges for the rural poor; and 3) opportunities for innovation for and with the rural poor. A concluding section 4) draws out suggestions for IFAD to consider in developing an innovation policy and an entrepreneurial approach to service delivery. The terms of reference are included in the appendix.

1 Understanding innovation

Much of the early thinking about innovation as a driver of economic development is attributed to Joseph Schumpeter in the first half of the 20th Century (see, for example, Schumpeter (1947). Schumpeter adopted a narrow view of innovation that is now regarded as too restrictive (Box 1). A definition that is more widely appropriate is the application of technological, institutional and human resources and discoveries to productive processes, resulting in new practices, products, markets, institutions and organisations that are improved and efficiency-enhancing. Nevertheless, Schumpeter’s bracketing of innovation and entrepreneurship is significant.

Box 1 Innovation and entrepreneurship

According to Schumpeter the defining characteristic of the entrepreneur is 'simply the doing of new things or the doing of things that are already being done in a new way (innovation)' (Schumpeter, 1947: 151). He distinguished between entrepreneurship and management: innovation is not to be expected under systems of management that are not entrepreneurial, that are not characterised by novelty, or the capacity to develop and implement a 'new idea'.

He also distinguished between the role of the inventor - the creator of a new idea - and that of the entrepreneur - one who 'gets things done'. 'Getting things done' happens through the application and implementation of new ideas, and employs mechanisms such as 'leverage', 'catalysis' and marketing.

Figure 1 Innovation processes

According to Enweze (2005), only innovations that have been identified by poor people themselves will make a difference in agricultural development. The central point that the poor should be involved
is assumed; also, that rural know-how and culture are assets, and that it is important not to underestimate the capacity of the poor to innovate. The significance and contribution of farmer innovation is a theme to which the report returns below, when innovation partnerships and systems are considered, and at other points. Nevertheless, there are areas of innovation which arise from formal systems and generic technologies, and from outside the rural sector, that can be brought to bear on rural poverty by adaptive processes.

The following section presents a discussion of these issues and at the end addresses the assumptions underlying IFAD thinking according to the ToR.

1.1 Sources of innovation in agriculture

Informal systems
Innovation in agriculture has happened for millennia, through the processes of natural selection and through human purposive selection (Lipton, 2005). These ‘informal’ processes of R&D involved the unorganised activity of producers and uncontrolled and unsystematic transfers of technology. An additional source of innovation has been the transfer of technologies arising from human migration and trade, both important from the earliest times, but which accelerated after the European voyages of discovery. In the Third World, informal R&D activity continued to be the major source of technical innovation until after WWII, apart from a small number of plantation activities (Biggs & Clay, 1981). Small-scale farmers’ own creative responses have continued to be important sources of improvement to agricultural productivity in many regions of developing countries, but the convergence of such activity with the research efforts of formal systems has been a slow process, with mixed results, and is still suboptimal.

Formal systems
The process and rate of formal agricultural research and innovation were accelerated by the application of scientific methods in the relatively advanced economies, and by the Industrial Revolution, in the 18th and 19th centuries. The formalisation of agricultural R&D for developing countries was boosted by the massive investments of the Rockefeller and Ford Foundations which led to the Green Revolution. This involved the transfer of genetic material from Japan to Mexico and the subsequent experimentation alongside local farmers, leading to the development and dissemination of dwarf high-yielding varieties of wheat. Similar processes led to the development in the Philippines of varieties of rice with similar attributes, and also improved maize varieties. There was no conscious mandate for the Green Revolution and it was partly through good fortune that the new varieties developed in Mexico were suitable for Asia. Although initial research was conducted by scientists in continuous and close contact with Mexican farmers (Biggs et al., 1981), the Green Revolution is conventionally viewed as an output of public sector research: ‘The key elements in improving food security in Asia from 1970-95 were government policies reflecting a belief that investments in increasing agricultural productivity were a prerequisite to economic development’ (Asian Development Bank, 2001: 2). Nevertheless, the Green Revolution in Asia has also been interpreted as a classic example of a farmer-first participatory methodology (Biggs & Smith, 1998). It was also the result of a fortuitous conjunction of resource availability, timing, demand growth, and active policy support.

The dissemination of new seeds and associated technologies, and the complementary changes in public investments and institutional support, led to unprecedented productivity increases, particularly in Asia and Latin America. There are virtually no other examples of mass poverty reduction since the 1700s other than the processes unleashed by this process of formal agricultural innovation and the consequent increases in crop productivity within the small farm sector (Lipton, 2005).

The level of investment in formal agricultural research by national organisations and the international community that serve developing countries is not known with certainty, but it is likely that the total during the past 30 years exceeds $100 billion: ‘It is legitimate to ask whether resources of this
magnitude have been well spent—that is, have they been used efficiently and achieved the intended impact?’ (Matlon, 2003: 123). Although many studies of the productivity of agricultural research have shown positive returns, there are notable failures of the formal innovation systems. For example, considerable investment in the World Bank Training and Visit system of agricultural extension resulted in little change or improvement (Moore, 1984). Since the end of the 1980s, investment in formal R&D has declined, and diminishing returns and contextual factors have constrained the rate of poverty reduction: ‘Despite the successes of the Green Revolution, the battle to ensure food security for hundreds of millions miserably poor people is far from won. Mushrooming populations, changing demographics, and inadequate poverty intervention programs have eroded many of the gains of the Green Revolution’ (Borlaug, 2000: 487).

Ongoing debates
Questions remain, therefore, about formal and costly agricultural innovation systems. Many poor people have not benefited from technological development, research processes have been dominated by a top-down public sector model, beneficiary participation has been difficult to achieve effectively, and policy and donor pressures are forcing changes in both international and national institutional architecture, research organisation management, and stakeholder dynamics.

Exclusion?
The Green Revolution occurred in areas identified as the favoured and resource rich areas of some developing countries (World Commission on Environment and Development, 1987); the agriculture in resource poor regions (Chambers’ complex, diverse and risk-prone – (CDR) - agriculture (1989)) was much less affected. The Green Revolution in Zimbabwe, which preceded that in India, was linked strongly to the large commercial farm sector (Eicher, 1995), while in Malawi, the long period of technical stagnation was has been caused by lack of effective demand (Smaie, 1995). Much of Africa and other poor and heterogeneous regions have been excluded, even though formal public R&D systems have been in place since the mid-20th century. Even where there have been successes – public research has generated significant productivity-enhancing rice technologies in West Africa, for example (Dalton & Guei, 2003) – the benefits have been largely confined to favourable ecologies. The impacts on small farmers and in the less favoured regions have been more modest. In Nepal, for example, fewer than 5 out of 49 officially released rice varieties are widely adopted; the formal seed system accounts for only 10% of seed demand (Pratap, 2005). In spite of the dramatic increases in agricultural productivity, the Green Revolution and the predominantly public effort out of which it originated has been criticised not only for the widely-acknowledged failure to bring about improvements in resource-poor areas, but also for sector-wide secondary adverse effects through mechanisation, increasing inequality, and increasing dependence on high-input intensity (IFPRI, 2002).

Public policy?
Exclusion of poor farmers in CDR and other areas has been due not only to the lack of targeted and situation-specific technologies. It is well documented that the spread of GR technologies was facilitated by supportive public policies and infrastructure at critical stages (Dorward, Kydd, Morrison, & Urey, 2004). It is not just geographical remoteness and unfavourable ecologies, therefore, that have limited the uptake of new technologies. Goldman and Smith (1995) suggest that weak infrastructure and poor market access associated with sparsely populated and remote areas in northern Nigeria may be an important determinant of technology adoption, but not these factors alone. Significant differences in the diffusion of agricultural technology and innovations between two otherwise similarly endowed areas were attributed to the character of local government and to the relative commitment to rural development: in areas with higher rates of agricultural innovation there was less centralised, more development-oriented, politically-responsive local government. The effect of the local Green Revolution was to create or exacerbate inequality between more prosperous and less-favoured areas, based partly on the local institutional context.
Principal or multiple sources of innovation?

The sources of innovation in agriculture, therefore, can be viewed as coming from two generic sources: informal systems of experimentation and selection; and formal R&D systems that are mostly part of national and international public sector organisations. Nevertheless, there is a tension between the approaches to innovation that emphasise either the ‘central source of innovation model’ and the ‘multiple source of innovation model’ (Biggs, 1990): the former model often underlies the theories and rhetoric of formal agricultural research and extension institutions: 'Most major technical and institutional innovations are seen to arise from the systematic work of international research centers…' (p. 1481).

The multiple sources of innovation model places agricultural research and diffusion processes within the historical, political, economic, agroclimatic, and institutional context in which technological change takes place, and embraces serendipity, natural selection and farmer selection: 'Innovations are seen as coming from diverse sources of which international centers are just one. Other sources are farmers, extension staff, non-governmental organisations and national research systems' (Biggs, 1990). Ruttan and Hayami (1990) drew attention to agricultural development that results a) from innovation as a response to changing incentives in public sector organisations induced by changing resource endowments and economic change, as well as b) the response by individual firms – or farmers – to changing market signals. Thus, innovation is brought about by dynamic relationships and demands – a ‘dialectic interaction’ (p. 103) among individual farmers and their collective organisations, public research institutions, perceptive scientists and administrators. Contextualisation of agricultural research is therefore strong within the multiple source model.

Changing responsibilities, changing emphases: the role of the private sector?

Debate about the respective responsibilities of private and public R&D has at its root the concept of market failure and public goods, which is the basis for the significant role of national and international public organisations in developing country R&D. Nested within the multiple sources model is the private sector: ‘large multinational corporations and small firms… have had a major influence on technological change' (Biggs, 1990). Ruttan and Hayami also comment that the allocation of effort between the public and private sector is of major significance. They imply a continuous reallocation of functions among public and private sector institutions as the environment changes: ‘As institutions capable of internalising a large share of the gains of innovative activity are developed, it may become possible to transfer activities… to the private sector…’ (Ruttan et al., 1990: 108).

The ability of private sector corporations to impose excludability through both institutional innovation as well as technological innovation has introduced a new factor into innovation policy debates. This is most obvious in connection with the development and dissemination of transgenic crops. The impact of new biotechnologies on the poor is perhaps the most contested area of debate (Box 2). But with limited exceptions, the literature, hitherto, is rather quiet about the linkages between pro-poor agricultural innovation and private enterprise (Lipton, 2005).

Box 2 Private sector participation

‘Because most of the genetic engineering research is being done by the private sector, which patents its inventions, agricultural policy makers must face a potentially serious problem. How will these resource-poor farmers of the world be able to gain access to the products of biotechnology research? How long, and under what terms, should patents be granted for bioengineered products? Furthermore, the high cost of biotechnology research is leading to a rapid consolidation in the ownership of agricultural life science companies. Is this consolidation desirable? … …Since much of the biotechnology research is under way in the private sector, the issue of intellectual property rights must be addressed and accorded adequate safeguards by national governments.’

(Borlaug, 2000: 488)
Generic, or platform, technologies?

ICT is another example of private sector innovation of major significance. Information and communication issues have been key topics for agricultural education and extension for decades. ‘Old’ information and communications technologies such as radio and television have been and continue to be important tools in the attempt to link farmers more closely with market demands, yet market information systems continue to be a weak point in rural development (Poole, Kydd, Loader, Lynch, Poulton, & Wilkin, 2000a). The development of ‘new’ information technologies (such as satellite radio and television, internet-based media and cellular telephony) has created additional media for overcoming the information gap. These ICTs comprise a range of technologies that have not been developed specifically for either poverty reduction or the rural sector, but which have been adopted and in some cases been adapted for, and by, rural users.

‘Biotechnology’ (or the range of biotechnologies) is an example of innovation interaction between the agricultural sector and non-agricultural research that has considerable ‘pro-poor’ potential as well as posing important governance, property rights, ethical, environmental and ‘anti-poor’ questions.

Towards beneficiary-centred and participatory research?

Evolving out of the debate on the multiple sources of innovation has been the question about the centrality of beneficiaries in the innovation process. Recognition of farmers as stakeholders, not only as beneficiaries but also as sources of traditional knowledge and as experimenters, led to ‘farmer first’ approaches. The explicit participation of farmers generated farming systems research, in which the complexity and specificity of tropical smallholder farming systems was recognised, and the involvement of farmers in decision making was sought. The results and transferability were often disappointing, because of an inadequate understanding of the specific and historical context in which these activities were developed (Biggs, 1995).

The farmer innovation approach is an important alternative to the conventional ‘technology transfer’ paradigm. Assefa (2005) and many other researchers close to rural people assert strongly that there is still a gulf between formal and farmer innovation systems, and a lack of recognition that farmers, especially resource-poor farmers, continually innovate in order to survive. Rural peoples’ own knowledge (indigenous technical knowledge, or ITK) should be viewed as dynamic knowledge, not ‘business as usual’, but ‘business unusual’. Persistence with farmer innovation has led to well-documented success stories (Reij, 2005). A series of detailed studies from across Africa demonstrates how small-scale farmers experiment and innovate in order to improve their livelihoods despite adverse economic and agri-environmental conditions (Reij et al., 2001). Approaches to agricultural development that take local innovation as their starting point can tap into a rich source of creativity and ingenuity. As such they provide proof of the ingenuity, creativity and perseverance of small-scale farmers (Box 3).
An important component of the farmer innovation approach is to enhance communication between various development actors and farmers who are looking for or have found innovative solutions to small-scale farming challenges. A key challenge for the farmer innovation approach to be effective is dissemination of technology and methodology. There is also an important role for farmer-to-farmer exchanges and exploitation of indigenous systems and channels for sharing agricultural information and inputs, rather than relying on formal extension systems to disseminate innovations (Reij et al., 2001). The critical challenge is to involve national agricultural research systems in strengthening the innovative capacity of farmers. This requires a redefinition of the traditional role of formal researchers and extension agents, and many more researchers willing to work with farmers and assist with farmers’ own research agendas.

Networks and innovation systems?
Participatory approaches to R&D have evolved into coalition building (Biggs et al., 1998), which has enlarged the stakeholder concept and encouraged research partnerships with novel ways of involving beneficiaries. Latterly this has evolved into a systems approach to innovation. Biggs and Matsaert (2004) note that the importance of linkages between actors, coalitions, alliances and flows of information to successful innovation, and to the development of sustainable innovation systems, is widely accepted, but that these aspects are often not addressed systematically and explicitly. They argue in favour of ‘actor-oriented approaches’, recognised as important to rural innovation by other social scientists, eg Long & Long (Long & Long, 1992), and suggest various techniques to involve beneficiaries and create a dialogue with researchers.

The use of Social Network Analysis (SNA) to map stakeholders and information flows is one such technique (Clark, 2005). SNA is concerned with the study of social behaviour and looks at the interplay between actors and the structures in which they exist. By identifying how actors participate and inter-relate, the structure of the social system can be elucidated permitting analysis of how resources such as goods, capital or information are exchanged within the rural system.

Hall et al (2001) develop the coalition, stakeholder, partnership viewpoint by exploring the conceptual basis for existing and emergent institutional patterns in partnership approaches to technology development. Consistent with the multistakeholder view, they argue that agricultural innovation is a process which involves a wide range of organizational types that can be understood as ‘national innovation systems’. This perspective marks a significant change from conventional theory by providing a framework for the analysis of complex relationships and innovative processes between multiple and heterogeneous agents, social and economic institutions and endogenously determined technological and institutional opportunities (Spielman, 2005). The innovation systems approach is ‘well suited for development purposes, because it explicitly acknowledges the political as well as
in institutional and cultural aspects of innovation processes; it stresses the importance of interactions between actors and organizations; it takes into account the multiple actors with different roles and goes beyond the “state or market” dichotomy, making room for more “bottom-up” and associative networks; and it highlights interactions between users and producers, assigning an important role to usually neglected actors, such as workers or consumers’ (UN Millennium Development Project, 2005: 25). To this systems view, Golden et al. (2003) add the concept of entrepreneurship, usually regarded as the commercial exploitation of innovation.

**Partnerships in innovation?**

Within such innovation systems, partnership is a core methodology for engaging science and technology development with the livelihood demands of the poor. In this sense, partnership means collaborative relationships between the public and private sectors, and between ‘research’ and ‘non-research organizations; and ‘private’ signifies all forms of organisation outside government including the enterprise sector, NGOs, farmer organisations. Characteristics of successful systems are (Hall, Rasheed Sulaiman, Clark, & Yoganand, 2003: 222):

- continuous evolutionary cycles of learning and innovation;
- combinations of technical and institutional innovations;
- interaction of diverse research and non-research actors;
- shifting roles for information producers, information users and transfers of knowledge dependent on a need basis;
- an institutional context that supports interactions, learning and knowledge flows between actors.

Sumberg develops this systems approach further in the context of SSA agricultural innovation (2005). He argues that economic and political reform processes have pushed formal agricultural research towards a coordinated, multilayered, supra-national system. He identifies a tension between the decentralisation thrust of the 'new reform agenda' for national agricultural research systems and a strong centralising tendency of the supra-national initiatives, and also between the calls for greater integration and the growing appreciation of the importance of diversity, and the need for local prioritisation. Most importantly, the role of the users must be considered more fully: 'It is the idea of opportunities, and the acceptance that utilisation, as well as generation and dissemination, is a critical function of an innovation system, which highlights the importance of users or consumers of innovation' (p. 25).

There is still a need for caution in expecting to change attitudes among ‘professional’ researchers and innovators in all types of organisations. Expectations that relationships of true participation can be developed with development professionals will sometimes be disappointed: in a report of a recent workshop on developing partnerships at a renowned British university, it became clear that some academic researchers were only interested in the concept of partnerships for ‘extractive’ purposes, for its utility as a technique for improving research data collection (Pound, D. personal communication).

**Demand for innovation?**

Thus there is a conflict between the realities of research at national level, the drive to consolidate and integrate international public research under the CGIAR, and the bio-physical and socio-economic heterogeneity that characterises rural Africa. Sumberg (2005) highlights the importance of the problematic relationships between components of the innovation system, and 'the near total absence of an organised articulation of demand… For all intents and purposes, the demand-side of the innovation system is absent'. It is necessary to accept the existence of national characteristics and differences, and adopt a less directive approach with simple collaborative arrangements or networks for supporting more dynamic and yet reflective research. According to Harvey and McMeekin (2005), such restructuring of the ‘organisational architecture’ is necessary within the research systems for more advanced science, and needs to be tailored – contextualised – according to local situations.
Bentley et al. (2004) have analysed the nature of demand from farmers for agricultural innovation in Bolivia. Besides explicit demand for new technologies, they considered farmers’ implicit demand, which may be unarticulated ‘either because they do not perfectly understand the agricultural problem… or because they cannot imagine all the possible solutions’ (p. i). The Bolivian agricultural research system, which was disbanded in 1998, was reborn in 2000 (as SIBTA) with the intention of linking the national innovation system with farmers’ demand – explicit and implicit – through more effective participatory processes (Box 4).

Box 4 Articulating demand for innovation

Box 4 Articulating demand for innovation

‘SIBTA is an ambitious competitive funding organisation, following similar models established elsewhere in Latin America and a newly emerging paradigm for agricultural research (Byerlee, 1998). It attempts to fund public-sector agricultural research by competitive bidding, seeks to improve the accountability and relevance of agricultural research, and insists that all calls for research and funding come from farmers, in written petitions, preferably from organised groups (cooperatives, farm unions, indigenous organisations, etc.)…

(Bentley, Thiele, Oros, & Velasco, 2004: 1-2)

Partnerships in delivery: NGOs and the private sector?
The concept and practice of partnerships in development were changed dramatically from the 1980s onwards as structural adjustment policies were brought to bear on the public sector of developing countries and NGOs began to assume responsibilities for the delivery of public goods, particularly in the rural/agricultural sector (Poole, 1994). Now, (I)NGOs are at the forefront of many services that historically have been regarded as the responsibility of the state, but since liberalisation have not been taken up by the private sector. NGOs of both Northern and Southern origin have assumed an important role in channelling development support outside formal bilateral aid relationships, and have come to act as alternative service delivery systems for food security, institution and capacity building, and provision of public goods. Arrangements such as contracts and franchises continue to have potential to serve remote areas characterised by both state and market failure.

Nevertheless, NGOs can also be ideologically-driven and may fail to identify the complex interaction of power, knowledge and identity in ‘agency’ relationships, resulting in imposition of external ideas and lack of effectiveness. The difficulties with the introduction of agro-forestry technologies among rural indigenous populations in Mexico illustrates how different religious and social values and perceptions can lead to a clash of cultures and to the distortion of relationships within communities, and between unproductive relationships between ‘beneficiaries’ and intervening organisations (De Frece, 2005).

Much still has to be learnt about the role of the private sector, according to research conducted by IFPRI and CIAT into public-private partnerships (PPPs) in agricultural innovation (IFPRI, 2005). Out of a study of 125 PPPs for agroindustrial development in Latin America, it was noted that: ‘Although private-public partnerships recently have become a means of developing technological innovations throughout the world, in Latin America, especially in the less-developed Latin countries, such initiatives are rarely planned and executed well… Many efforts to build partnerships between public research organizations and the private sector fail to bring about pro-poor development or to develop new or improved products for the market, disappointing all parties… Key lessons include the importance of identifying and negotiating common interests, monitoring partnerships and fostering synergy to improve innovations and outputs, and capitalizing on the benefits of shared resources and learning opportunities.’
1.2 The impact of the wider reform agenda

New challenges concerning impacts, resources and the changing global agenda are facing the agricultural research community, parallel to the evolution of the role of IFAD: the mission of formal R&D systems is evolving from narrow productivity-enhancing research efforts towards broader poverty reduction objectives (Alway & Siegel, 2003; Berdegué & Escobar, 2002; Chambers, 2003; Horton & Mackay, 2003; Sumberg et al., 2004). There is also new thinking and practice concerning the importance of market-led linkages in driving rural market development (Bernet, Devaux, Ortiz, & Thiele, 2005; Devaux, 2005; Hellin, Griffith, & Albu, 2005; Poole, 2005a; Sanginga, Best, Chitsike, Delve, Kaaria, & Kirkby, 2004).

Differentiation and targeting

Berdegué and Escobar (2002) have argued for differentiated strategies and a more clearly targeted approach to supporting agricultural innovation for poverty reduction. They advocate a tripartite division based on assets and strategic opportunities of the target population (p. i):

- ‘Where assets are favourable for competitive agricultural development, particular emphasis should be given to commercial initiatives and private sector contributions;
- ‘Where farmers have the potential to embark on market-oriented agriculture but are constrained by their asset base, public (and private) efforts should aim to provide resources and experience to develop a vibrant small farm sector;
- ‘Where rural households lack many of the assets that might allow them to profit from commercial agriculture, more broad-based rural poverty reduction policies must be pursued, often in collaboration with local organisations and NGOs that can facilitate building linkages and institutions.’

Organisational innovation within research systems

Chambers (2003) highlights new ideas about innovation systems, impact pathways, institutional learning, pro-poor rural innovation, and action learning, all of which are closely linked to innovation within, and not just by, research organisations (Box 5). ‘They are evidence that the paradigm is evolving. The shift is from linear pipeline to learning process. Action learning, with participants as action learners, is an umbrella phrase for the fundamental changes in concepts, methods, mindsets, values, rules and behaviors that are beginning to alter the practice of agricultural research and development’ (p. 119-120).

Box 5 The learning organisation

‘Institutional Learning and Change (ILAC) is part of an emerging redefinition of good professional practice in agricultural science... There is, however, a unifying core around which all this complexity, diversity and dynamism can be oriented and organized: the commitment of the international community of international financial institutions, R&D organizations, and individual professionals, to attacking poverty through institutional learning and change as opposed to cosmetic organizational restructuring...

‘Institutionally, there are implications for the policy process, for governments, and for research organizations and their management, incentives, procedures and cultures... ILAC presents formidable challenges to national organizations as well as to the Centers of the CGIAR research network and the financial, donor and NGO communities. ILAC implies continuous learning and unlearning in place of one-shot ex post evaluations; learning from what does not work as well as from what does; acknowledging, managing and moderating asymmetrical power relationships; emphasizing broader and more equitable relationships; involving the full range of stakeholders, not least poor farmers; and relating to farmers’ complex, diverse and risk-prone realities.’

(Chambers, 2003: 120)
Institutional learning is explicit in the innovation systems, according to Hall et al. (2003). They argue that only by dropping repetitive cycles of narrow economic evaluation and adopting a systems learning perspective will agricultural innovation systems find better ways to fulfil their social and economic purpose. Morris et al. (2005) refer to such systems as learning alliances. ‘Successes and failures, particularly in agriculture and industry, must be documented. These “good” learning practices need to be institutionalized into structured relationships between market and non-market organizations’ (UN Millennium Development Project, 2005: 36).

The private sector and the evolving research agenda

There is a strongly held and cautionary view about the changing research agenda. Sumberg et al. (Sumberg et al., 2004) argue that income diversification among poor rural people in SSA will reduce the benefits from investment in the development of new agricultural technologies. In the context of Bryceson’s ‘de-agrarianisation’ (Bryceson, 1996), increased income diversification among smallholder farmers in SSA may result in reduced gains from adopting new technologies and disproportionately large transaction costs associated with information acquisition to inform technology choice decisions.

‘There is, in short, the distinct possibility that the new reform agenda will serve to strengthen the historical (and much criticised) tendency for agricultural research and development services to focus on the commercial agricultural sector and the needs of the relatively well-off. If, as many suggest would be desirable, the private sector is to play an increasingly important role in the provision of research and extension services, this tendency will only be reinforced’ (Sumberg et al., 2004). Their conclusion is summed up in Box 6:

Box 6 Limitations to the impact of agricultural development research?

“There may well be potential for growth in the agricultural sector, and agricultural research will certainly have to play a role in the realisation of this potential. However, it is not obvious that this growth will be rooted in technological transformation among millions of small-scale, poor and diversified farmers, or those living in low-potential areas. Much as it goes against the grain, for policy makers and agricultural researchers alike, we must now seriously consider the possibility that there may be large parts of the rural population who currently engage in farming to some level, but who are unlikely to gain any direct, sustainable benefits from agricultural research, technology development or extension efforts. A much broader view of the potential contribution of agricultural research to rural poverty alleviation is badly needed.’ (Sumberg, Elon, & Blackie, 2004: 143).

Despite this discouraging conclusion, they suggest three aspects of the reform agenda that may help pro-poor agricultural growth:

• diffusion of ‘deconstructed’ of innovations so that they can be contextualised and ‘reconstructed’ by potential adopters;
• engagement of groups of farmers in the design and testing of innovations through mechanisms such as participatory learning and action approaches;
• use of communications technologies to improve the quality, relevance and accessibility of information.

1.3 Key issues on understanding innovation

The history of agricultural development does in fact show that innovation ‘external’ to the rural poor can be effective under certain circumstances. The Green Revolution was predominantly a case where external resources were brought to bear on an agronomic problem identified by outsiders, resulting in a novel technological mix. Nevertheless, farmers did participate to a degree in the innovation process,
and enabling policies and complementary investments in rural infrastructure and services were essential for uptake.

The fundamental innovations in new ICT that are impacting developing countries have arisen from entrepreneurial initiatives that are also remote from the rural poor. Where uptake and impact have been most widespread and effective, it is the opportunism of private sector corporations and small scale entrepreneurs that have enabled such dramatic uptake (mobile phones). The example of Grameen Phone shows that this process can be facilitated by NGOs. These cases are found where generic, or ‘platform’ technologies are developed, either by private or public sector initiatives, based on technical invention and entrepreneurial exploitation, and then distributed, adopted, and adapted if necessary and applied to local problems. Even trickle-down can work under these circumstances. So innovation with the poor is not a pre-condition for the development and distribution of new technologies, because generic technologies can be adopted, adapted and applied by the rural poor. In this sense, therefore, successful rural innovation is not always ‘with’ the poor.

The history of the agricultural sector (like many others) demonstrates that external initiatives fail, and for many and diverse reasons, much written-about. Formal innovation systems have often excluded the needs of the poorest, and their own contribution to reducing poverty. Interventions from multiple sources (eg the public sector, international donors, NGOs) have led to the imposition of solutions with inadequate consultation, partnership and ownership by the rural poor. Poor peoples’ demands are often poorly articulated. On the other hand, private sector initiatives often can be effective and sustainable, but not targeted towards the poorest, because satisfying the needs of the poorest is likely to be relatively unprofitable.

These failures continue, for example, where formal systems (agricultural) research work to a self-formulated agenda and where enthusiastic but misguided NGOs impose solutions. This even applies to the case of generic technologies which are taken up and distributed through donor-designed interventions: for example, innovative ICT systems for delivering market information may only repeat the typical top-down mistakes of inappropriateness, unsustainability and irrelevance. This is an acute problem where interventions are based on a commercial model which the private sector eschews because it is apparently unviable. Rural innovation ‘without’ the poor is very often unsuccessful, and ‘commercial’ innovation without the private sector is also likely to be unsuccessful.

The history of rural innovation shows that external resources can be unnecessary: rural peoples’ abilities to initiate and innovate are not to be underestimated. Local culture, rural identity and know-how (survival skills, ITK, and entrepreneurship) are to be considered assets that form the basis for innovation within rural societies. Deep participation, if not ownership, by beneficiaries is essential at some or all stages of the innovation process: recognition of need, articulation of demand, design of the innovative solution, implementation, replication, and upscaling. The complex problems presented by current challenges to rural societies, outlined below, suggest that external resources increasingly need to be brought to bear on rural problem solving, with partnership at each stage of the innovation process.

It is redundant – almost – to point out that it is the rural poor in remote and marginalised regions and complex, diverse and risk-prone natural environments for whom adoption and adaptation of platform technologies is most difficult. Such innovation can be inherently and fundamentally unsuitable for specific regions or peoples through lack of understanding of local resources and demands and poor adaptation. Dissemination and adoption even of appropriate technologies can be weak if complementary policies and services are not in place. Innovation for and among the IFAD target constituency of the ‘rural poor’ will always need to reflect contextual factors to be effective. Identification and understanding of these contextual factors is essential and is likely to be costly. The innovation and rural development processes are complex by nature: they result from the interaction of many diversified and complementary actions, coordinated by different actors. Innovation processes must be flexible, and solutions may often be specific to the local contextual factors: political, economic, geographic, social, cultural.
Decision-making processes are the result of power, knowledge and information relationships. Interests of stakeholders from the global community through national and regional hierarchies to down to local community and intra-family processes will influence the innovation process and success in reducing rural poverty. Even within poor rural communities, there will be political, economic, social, and cultural heterogeneity. **Understanding and optimising the institutional environment at these multiple levels, enabling support for innovation with, by and for the poor is, therefore, an essential element of success.** Innovation is likely to threaten existing relationships by disrupting the ‘established rules’ and plans, and needs to be managed with (institutional) strategies, good governance and new partnerships. Innovation systems is a necessary approach, and organisations participating with the rural poor need to have a culture of inclusiveness, learning and reflection in order for partnership to be effective and conflicts identified and resolved.

## 2 Challenges for the rural poor

The principal challenges for the rural poor can be grouped under the headings of political, economic, social, and environmental factors, as in Figure 2. Not every issue will be covered in this paper, which will focus on challenges and opportunities most closely related to the IFAD mandate. The diverse drivers of change affect the economic, social and demographic fabric of most countries, drive competition and technological innovation, and accelerate the rate of resource consumption and waste emissions. But causation is complex, the effects are not always negative, and out of the challenges there arise opportunities. The impact of these challenges and the extent to which the rural poor can take advantage of the opportunities are affected by the constraints faced by the rural poor, and the outcomes will determine the rate of progress towards achieving the poverty reduction and development goals set by the international community.

![Figure 2 Challenges and the rural poor](image)

### 2.1 Globalisation

Although primarily an economic phenomenon, there are important political, social and cultural effects that accompany globalisation and the integration between countries of factor and product markets, and the diminution of time and space. It is not a new phenomenon, inasmuch as regional and global
interaction and exchange have been happening for millennia. It is the rate of change that is new. It has been accelerated, partly through the mid-20th century creation of diverse international organisations, a ‘western’ (but ‘contested’) policy consensus, and technological advances in transport and information exchange, firstly in real time and space, and in the latter part of the 20th century, in a ‘virtual’ sense.

Globalisation, therefore, is associated with a range of technological changes in information systems and the production, transformation and distribution of goods and services. However, integration of markets and cultures is neither universal nor homogeneous (Huntington, 1996; Levitt, 1983) and important local effects will be evident in disaggregated statistics and regional and local studies. Nadvi (2004) suggests that micro-level studies are necessary to uncover the differential effects of globalisation on the poor. Access to global value chains can open up important opportunities for poverty reduction through increased enterprise and employment (e.g. garment manufacturing in Bangladesh and export horticulture in some parts of Africa). But barriers also exist in the form of minimum basic skills at the supplier level, high and demonstrable product quality standards, demand for innovative and value-adding business services, and buyer-retailer concentration. ‘Upgrading’ local capacity in developing countries creates winners and losers, and it is not clear that the poorest can participate.

The linkages between globalisation, industrialisation of the agrifood sector, and the impacts on developing countries, have been explored by Reardon and Barrett (2000), among others. Their conceptual framework includes a series of factors and interrelated effects (Box 7), from which they argue in favour of ‘a right kind’ of agroindustrialisation that ‘is most likely to yield broad-based, environmentally sustainable growth that creates wealth and improves human well-being’ (p. 203).

**Box 7 Globalisation and the rural poor**

| Meta-trends: | income and population growth; urbanisation; female employment; changing political economy; new technologies; |
| Global agrifood system changes: | liberalisation; supply chain coordination and technical change; |
| Developing country agrifood sector effects: | increasing firm scale, market concentration and internationalisation; differentiation and heterogeneity in demand and supply preferences; regulation and standardisation; capital intensity; |
| Development indicators: | changing productivity, labour intensity and employment; changing poverty and inequality; natural resource depletion and degradation; sociocultural impacts. |

Adapted from Reardon and Barrett (2000).

**Private sector concentration and pro-poor innovation**

On of the most critical areas of globalisation for agricultural development is the growth of and concentration among the major biotechnology companies dedicated to the development of plant genetic materials. Falcon and Fowler (2002) identify four worrying factors rooted in the globalisation of firms, legislation, regulation and property rights, and stakeholder awareness: new provisions on intellectual property, increasing firm concentration, public anxiety about the new technologies, and problems arising from international agreements. Pingali and Traxler (2002) question whether the poor will benefit from this increasingly important role of the private sector in agricultural research and argue in favour of identifying incentives for the private sector to participate in partnerships that will develop technology for farmers in marginal environments. Paarlberg (2002) highlights the importance of consumer and policy sentiment in rich countries as a real threat to the use of GM crops in poor countries. Tripp (2002), on partnerships, adds the question whether public agencies are capable of such interaction: ‘Advances in private agricultural research are contributing to increasing polarisation in access to technology. It is important to focus attention on the needs of resource-poor producers and the role of public research. But donor reliance on simple answers and a lack of vision and commitment in public agencies are as great a threat to pro-poor agricultural development…’ (p. 245).
**Agrifood market globalisation**

At almost any stage in history, trade in food products has been international. It was a general liberalization in European trade that included agricultural produce, and concurrent technological enhancements to increase agricultural productivity, and the revolution in transport and storage technologies – the steam engine, railways, steel ships, the opening of the Suez Canal, - that boosted international market integration in the staple food (grains) trade in the 19th century (Tracy, 1989). Subsequent innovation in storage technologies - canning and freezing – enlarged the range of internationally traded products, especially meat. Globalisation has happened more recently and most rapidly in the higher value, fresh produce (especially fruit and vegetables – F&V) and flower sector (Barrett, Ilbery, Browne, & Binns, 1999), enabled by cool chain technologies and controlled atmosphere terrestrial and maritime transport, and reductions in international costs, such as those for airfreight through the introduction of the Boeing 747.

Implementation of structural adjustment (SA) policies has been more or less contemporaneous with the massive reduction in real raw prices, which for some commodities in 2005 are less than 25% of the level of 1980 (Robbins, 2005). Meanwhile, the real prices of coffee, tea and cocoa products at the retail level are now 200-300% of the 1980 prices, and farmers may receive less than 0.5% of the retail price. This highlights the importance of attempts to realise value addition further upstream in the value chain. Deterioration in the commodities terms of trade has not only reduced market prices but also been accompanied by the SA-induced dismantling of marketing boards, the collapse of international commodities agreements. This has exposed developing country producers more directly to the volatility of international markets, and much-reduced seller power.

Agriculture obviously is one of the principal arenas for international policy disputes. The increasing participation of the so-called ‘Newly Agriculturalising Countries’ (Barrett et al., 1999) in global commodity markets has influenced international policy during the Uruguay and Doha Rounds of trade negotiations. For the rural poor, the internationalisation of trade policies and disputes is a critical element. Although recently debated at the WTO meeting in Hong Kong, expectations of an international competition policy with favourable outcomes for emerging or infant economies must be tempered. The formulation of local, national and transnational or regional policy initiatives to gain countervailing market power in specific market niches should not be discounted – there is a place for ‘selective industrial policies’ (UN Millennium Development Project, 2005), but neither the competitive commercial environment nor the international policy environment are propitious.

Besides policy effects, high levels of productivity and efficiency, sometimes allied to sophisticated capital intensive supply chains, are squeezing many developing countries in international markets for grains such as soya, other commodities (sugar) and some higher value products (bananas). Market concentration among intermediaries in the international commodities trade has also increased significantly since the 1980s, which poses important challenges for exporters (Robbins, 2005).

**Supermarketing**

The international (super-)market

The international expansion of leading food retailers has been analysed extensively in relation to the impacts on developing country agrifood systems in general (Reardon, Timmer, Barrett, & Berdegué, 2003) and in diverse regions: Latin America (Balsevich, Berdegué, Flores, Mainville, & Reardon, 2003; Reardon & Berdegué, 2002), Central and Eastern Europe (Dries, Reardon, & Swinnen, 2004), Sub-Saharan Africa (Neven & Reardon, 2004; Weatherspoon & Reardon, 2003), Asia (Cadilhon, Moustier, Poole, Giac Tam, & Fearne, 2006 forthcoming; Hu et al., 2004). Food systems in developing countries are undergoing rapid increases in sophistication, induced both by demand changes in local living standards and by increasing penetration of international firms (Balsevich et al., 2003). The phenomenon is dramatic, but also heterogeneous: in India, supermarket penetration is rising, but from a very low base, and is not generalised across the country. In South-East Asia, local situations vary across the region. In Taiwan, over 60% of food sales were transacted by the modern
retail sector in 2000; in Malaysia, modern retailers accounted for only 20% of food sales across the country; in the cities of Thailand, the modern sector’s market share of food sales increased from 25% to 50% in just five years. However, in all countries in the region, sales of fresh food – fruits, vegetables, meat and fish – are still a stronghold of the traditional retail markets and itinerant retailers (Cadilhon et al., 2006 forthcoming).

For example, the expansion of the major global retailers such as Wal-Mart and Tesco exemplify this trend in Asia, and also of Carrefour in the Americas. South African retailers are also expanding into other Sub-Saharan African regions. Recent research results from a number of Latin American countries illustrate how the development of domestic economies and the emergence of concentrated, powerful food retail sectors are both a challenge and an opportunity for local producers and supply chains (García Martínez & Poole, 2004). The benefits noted in South-East Asia (Vietnam) are increased employment in modern retailer outlets and in their dedicated supply chains extending back to rural areas; a general improvement of food quality through the transfer of technology and business practices among farmers; and lower retail prices (Cadilhon et al., 2006 forthcoming).

Northern supermarkets need suppliers, and opportunities for exporting from developing countries to northern supermarkets do exist, but increasing concentration among retailers in the north - particularly in the UK - is creating an increasingly hostile environment for suppliers (Queen, 2005). A recent workshop drew attention to the fact that not all international supermarkets have the same power and strategies, but the challenges for smallholders in particular and developing countries in general are formidable (IDS/IIED, 2005). There are significant economies of scale in volume and quality of supply, and in reaching business and phytosanitary standards. Beyond price and a range of business efficiencies, ‘something novel’ and additional is necessary to be listed and to launch new products. Increasing rationalisation among suppliers, and the fact that 'minimising risk is as important as maximising profit', means that the creation of layers of importing, processing, transport, currency exchange is insulating retailers and pushing risk back up the supply chain.

**Domestic supermarketing**

For LDC suppliers, ‘domestic’ supermarkets are becoming the dominant outlets for local fresh produce compared with export markets. These firms are engaging in relationship marketing and setting up dedicated supply chains as opposed to relying on traditional adversarial relationships in spot markets. The new business model characterised by slim margins and high quality has created new opportunities as well as new challenges for suppliers; self-service shopping, clean environments, price displays, and aggressive marketing and discounts are becoming the strategic norm (Cadilhon et al., 2006 forthcoming). The existence and growth of monopsonistic distribution systems and economies of scale in production, procurement, standards and regulatory compliance and skills upgrading suggest that small and remote farmers will be excluded from such markets (Box 8).

**Box 8 Supermarket challenges for LDC suppliers**

‘... there is evidence from Latin America of difficulties for small producers to enter supermarket channels – not so much because of their size, but because they often lack the adequate capital assets, human, physical, financial, and organisational capital, needed to meet product and transaction attribute requirements of the supermarket chains. In particular, there is emerging evidence that those with few liquid assets and low human capital do less well when dealing with supermarkets. Successful farmers need to be able to understand and meet the specifications of product quality and safety standards. They have to be able to produce on a regular basis and to deliver a large quantity of goods at a consistent rate. And they need to be able to do this at a low cost... Fieldwork suggests that similar challenges face food producers in China who want to enter supermarket supply channels’.

(Hu, Reardon, Rozelle, Timmer, & Wang, 2004: 581-582)
Nevertheless, the rapid rise of supermarkets is an uneven process, more rapid in some countries than in others due to contextual factors, particularly public policies, consumer cultures, business culture and supply chain organisation, and also food sector-specific characteristics (Cadilhon, Fearne, Giac Tam, Moustier, & Poole, 2005; Hu et al., 2004). Barriers to the advancement of the modern retail sector have been identified in the fresh food sector in Asian markets, due largely to deeply-held cultural values (Goldman, Ramaswami, & Krider, 2002). For consumers in Asian markets, ‘fresh’ food means ‘as close as possible to the live animal or plant’. Chilled and frozen meat, fish or fresh products are associated with a period of storage that thus makes the food un-‘fresh’, such that chilled food is not considered ‘fresh’ by many Asian consumers (Figué, 2004). In Ho Chi Minh City, Vietnam, where public policy is threatening traditional food markets, research has shown that the traditional vegetable distribution system is delivering services that are valued by millions of customers, particularly in respect of convenience: the city is congested, motorbikes are a preferred form of transport, and many consumers choose not to travel far to a store, or cross busy roads. Given their overwhelming market share, the role of traditional fresh produce supply chains is assured for the medium term despite the challenge of modern competitors (Cadilhon et al., 2006 forthcoming).

Grades and standards in national and international agrifood markets

The increasing incidence of national and international food safety scares and the globalisation of supply in the F&V sector have brought about the need for harmonisation of quality and safety standards. While the national and supranational public sector regulatory authorities have played a significant part in raising awareness of both safety and quality standards, the real driving force behind increasing standards has been the response of the private sector – mainly multiple food retailers in advanced economies – to consumer concerns about food safety and quality. ‘The resulting shift of responsibility towards the private sector has created a more complex and demanding ‘policy space’ involving public and private sector incentives and controls’ (García Martínez et al., 2004: 230). To some extent, food safety and quality standards are used as a tool of firm competitive strategy (Jaffee & Masakure, 2005), and in other respects, high specifications may have unintended consequences. Although high levels of phytosanitary standards can serve to improve business performance, and generally and in principle they are beneficial to consumers, there is a view that specifications can be exaggerated and distortionary in relation to apparent trade-offs among the different product quality attributes that consumers demand (Poole & Baron, 1996; Poole & Gray, 2002, 2003).

It is accepted that increasing demands for food safety by developed countries are likely to have particular impacts on developing countries. Producers and exporters in developing countries are likely to have difficulties in meeting technical regulations, standards and conformity tests, and the level of traceability required by importing firms. This is of particular concern for developing countries, where existing technical and institutional capacity to control and ensure compliance may not allow for the adjustments needed to meet new requirements (García Martínez et al., 2004). Hitherto, differences among international food retailers in respect of private standards have offered market opportunities to those fresh produce exporters with less developed quality and safety systems. Nevertheless, these opportunities are likely to diminish as retailers move towards harmonised private food safety standards. That the impact of private food safety and quality standards is not scale neutral but presents real challenges for small scale producers has been clearly shown in Zimbabwe (Henson, Masakure, & Boselie, 2005).

While local opportunities may continue to exist in domestic markets, it must not be assumed that there is an easier commercial option for farms and firms who do not wish to meet the challenges of sophisticated export markets (García Martínez et al., 2004). As noted above, food systems in developing countries are undergoing rapid increases in sophistication, induced both by demand changes in local living standards and by increasing competition from international firms: organisational change in procurement systems eschewing traditional wholesale markets, and exploiting the advantages of centralised purchasing, (implicit) contracts with suppliers and specialised or dedicated suppliers, and the provision of technical assistance (Berdegué, Balsevich, Flores, & Reardon, 2005). ‘The local market niches with low standards are disappearing under the pressure of
this wave, and the distinction between the global/export market and the local/domestic market is disappearing' (Berdegué et al., 2005: 385).

**Agrifood systems, business standards and biosafety**

The internationalisation of the food supply has also exposed consumers to new threats about food safety that are inadequately addressed by both private and public standards. Biosafety is related to both human health and environmental management practices. For example, publicity surrounding the South Asian 'brown haze' has highlighted the importance of airborne contamination in India, among other places, not only in respect of the well-understood respiratory hazards but also of the adverse macroclimatic effects and impacts on agricultural production (Poole, Marshall, & Bhupal, 2002). The occurrence of avian flu and similar health ‘scare’s has contributed to global concern about the spread of livestock diseases, particularly zoonoses, and has already prompted increased controls in international trade in livestock and livestock products, and controls of food safety and traceability in general. There is a broader context of agrifood standards work, and the challenges and opportunities:

In the first place, the rationale underlying the food safety issues has a broader expression in the imperative for **environmental protection**. Food safety hazards are caused by airborne contamination, soil and water-borne contaminants, and other sources, and can be found at all stages of the chain: from poor production practices, inadequate transport and storage, poor handling practices at wholesale and retail levels, to poor household practices. Specific mention should be made of practices that suggest the need for improved labour safety standards in agricultural production. The right use of agrochemicals is important not only for consumers but particularly so for the most vulnerable stakeholders in the food system, the farm labourers (who are likely to be poor and female).

Second, the agrifood industry is a sector with significant **microeconomic multiplier outcomes**. The production and postharvest handling of fresh fruit and vegetables is an important source of household incomes for rural and peri-urban producers, traders and retailers. Moreover, development of the food system has the potential for the creation of business opportunities in the domestic industry that again will increase value-added to food products, better satisfy consumer preferences, create further income and employment opportunities and contribute to poverty elimination. Thus the development of the wider economy will be enhanced through multiplier effects by the development of an efficient, effective, and environmentally sound food system.

Thirdly, enhancing the institutional framework for **business social responsibility** is relevant. Concepts of entrepreneurial and corporate social responsibility are critical for the development of the food system and for fair returns to stakeholders in the food system, including primary producers. Developing and implementing an improved regulatory framework for business conduct and social responsibility is a necessary (but not sufficient) approach to improving the business environment. Regulatory reform and building institutional infrastructure and capacity such as testing and accreditation systems are needed to help exporters to meet international food safety and quality standards (García Martínez, Poole, Skinner, Briz, de Felipe, Yalcin, Koc, Akbay, Ababouch, & Messaho, 2005).

**2.2 Barriers to entry**

**Poor infrastructure**

The comments above highlight some of the challenges and barriers to the participation of the rural poor of developing countries in advanced agrifood market systems. Poulton and Poole (2001) analysed the issues and options facing tree fruit producers in developing countries. Market access problems are a function of the weak asset base and poor access to information and contacts of most smallholders. They are exacerbated by the perishability of agrifood products, and are also more acute in more sophisticated and long-distance markets, especially where communications and transport systems are rudimentary or absent. Infrastructure weaknesses, therefore, are fundamental problems affecting the rural regions which are IFAD’s primary concern: road construction and upkeep,
provision of potable and irrigation water, transport systems, telephone and other communications infrastructure, rural electrification.

Platteau (1996) assessed the importance of infrastructural constraints, particularly in transport and communications in sub-Saharan Africa where low population densities and long distances result in the costs of transport and other essential services being comparatively high. It is therefore all the more necessary, he argued, to seek cost-effective ways of improving provision in order to maximise agricultural productivity.

Inadequate information

Because of the lack of communications systems – taken to be not just technology but also information, feedback and human resources - in many areas of developing countries, smallholder farmers face considerable information gaps (Poole et al., 2000a). Smallholders often do not have timely access to salient and accurate information on prices, locations of effective demand, preferred quality characteristics of horticultural produce, nor on alternative marketing channels. Producers often experience a weak bargaining position vis-à-vis traders. Information that is available to rural communities may not be equally distributed, and smaller scale producers and those distanced further from the market are more disadvantaged. Geographical constraints constitute barriers to information flows just as much as to physical flows of produce. Therefore remoteness from markets exacerbates informational problems. There is a range of other factors which affect market efficiency and may constitute barriers to market access and information flows of a horizontal nature. Among these are gender, family, educational levels, other social factors, and ethnicity; specialisation of production and the effect of reputation, and the existence of trust and repeat dealing (clientisation). The results of informational barriers are unexploited market opportunities, seasonal gluts and produce with inadequate quality specification and control, inequitable returns to producers, peri-harvest (in field pre-, and post-harvest) losses and fundamentally poor returns to the production and marketing system as a whole.

Developments in information technology are one of the most visible and important areas of innovation that are helping to overcome the information constraints that limit market exchange and non-economic characteristics of development among the rural poor. These will be covered in a later section of this paper. Rural energy is another constraint the significance of which is likely to increase as current prices and recent trends suggest that petroleum-based energy sources are likely to increase in cost. This is likely to affect the prices of agricultural inputs, notably fertilisers.

Weak institutions and supply chain management

There is evidence from Zimbabwe that exclusion of smallholder farmers from sophisticated supply chains is not inevitable, but that mechanisms can be put into place to enable smallholders to comply with higher standards (Henson et al., 2005). Coulter et al. (1999) and Masakure and Henson (Masakure & Henson, 2005) also comment on the opportunity that contract farming can create for smallholders. In the case of Hortico Agrisystems, who source high value horticultural products from 4000 growers and export to the UK supermarkets, contract farming enabled suppliers to overcome access barriers and surmount imperfections in input and output markets, as well as increase incomes, benefit from knowledge transfer, and gain in prestige. For some labour-intensive and otherwise high-care products, smallholders may have a competitive advantage. The solution seems to be in improving supply chain management practices: Investment and training are necessary, but crucially, ‘... a relationship between small-scale producers and the exporter needs to develop that is based on trust and mutual dependency and that secures the long-term commercial sustainability of both parties’ (Henson et al., 2005: 382). Cooperation, with or without contracts, is a means to overcome market failures in related goods and services markets, particularly, agricultural inputs, credit and output marketing (Dorward, Kydd, & Poulton, 1998). While novel institutional arrangements do pose threats and challenges to smallholder farmers, they can be more optimistically viewed as opportunities, provided smallholders can meet certain conditions.
The shift of focus to supply chain management is a relatively new phenomenon, and involves more organisational ‘players’ than just suppliers and customers. According to Barrett et al. (1999) ‘… new food networks are evolving to satisfy both the consumer and the producer, but they are mediated and controlled by the multiple retailers through the regulatory power vested in them’ (p. 173). However, the network concept is evolving from the market chain approach. Hatanaka, Bain and Busch (2005) acknowledge that the rise of third party certification (TPC) reflects the growing power of supermarkets to regulate the global agrifood system, but that at the same time, TPC also offers a role to non-governmental organisations in the management of international supply chains and also generates opportunities to create alternative business models that are more socially and environmentally sustainable. Giovannucci and Ponte (2005) state that in the global coffee industry, it is not just the multinational firms but also new actors such as NGOs, industry associations and public–private partnerships that provide the normative framework that corporations use for social legitimacy: ‘Standards are thus being set outside the classic boundaries of governmental and inter-governmental authority and through amorphous alliances of corporations, NGOs, and civil society groups that tend to reach agreements on the model of collective bargaining’ (p. 298).

2.3 Mobility, migration and labour markets

The internationalisation of labour markets is another phenomenon of globalisation that affects not only highly mobile, highly skilled workers, but also the migration trends from developing countries to richer economies. Like other contextual phenomena, migration is not new, but the rate and effects have increased in the latter part of the 20th century, fuelled by unequal economic growth between regions, skills shortages and high labour costs in DCs, adjustment (both tightening and relaxation) of migration policies, more accessible information about opportunities, and internationalisation of an ‘economic dream’ through popular media.

The latest UN figures suggest that nearly 200 million people are international migrants (International Organization for Migration, 2005). Both the rate and composition of migration are changing with regard to the origins, destinations and the timeframes of migrants. The rural population in many developing countries is a source of migrants to regional, national and international destinations, but under certain circumstances rural areas can be a destination. Outward migration from the rural sector is likely to depopulate the rural socioeconomy of young, able workers, but also creates flows of remittances that in some countries have become a massive source of capital and foreign exchange. How these resources are used is likely to affect local development in sending communities and countries. In Turkey, remittances did contribute towards consumption activities, with positive effects on household welfare. Nevertheless, these so-called ‘consumption’ activities can be regarded and investment in productive activities, including nutrition and education (Koc & Onan, 2004).

Effects of migration on the rural poor are complex. Analysis of data from 71 developing countries has shown that both international migration and remittances significantly reduce the level, depth, and severity of income poverty in developing countries (Adams & Page, 2005). Nevertheless, evidence that migration can be counter productive has been found where natural resource depletion and desertification are drivers of migration, as in Egypt. There, temporary forms of migration dominate, and enable the continuation of farming, which otherwise would not be economically sustainable, subsidized by remittances. This leads to further resource mining. Farm land is usually only abandoned when it is damaged beyond recovery and livelihoods no longer secure, or when strategies of migration are so profitable that farming is no longer considered worthwhile (Knerr, 2004).

Return migration is becoming significant (International Organization for Migration, 2005), with increasing possibilities of skills transfer in addition to improving flows of financial resources. Social effects are many and varied (Box 9): depopulation has many downsides, but improved information technology and lower communications costs enables migrants to participate more effectively in the political, social, cultural and economic life of sending communities and countries (International Organization for Migration, 2005).
The gender dimension is significant and under-researched: women circulate differently from men in the global economy, largely engaging in the service sector. Such activity is even being promoted as a development strategy (Department for International Development, 2005), notwithstanding the fact that women are the majority of victims of trafficking. Migrant health, particularly in relation to HIV/AIDS, is a growing problem (International Organization for Migration, 2005).

Box 9 Migration and development

“The relationship between migration and development is complex and difficult to assess, yet many national and international development agencies are seriously exploring ways of reaping the development gains from migration. Public perceptions are often negative: migration grows out of and causes further poverty both in the sending and receiving country. Experts have examined the cause-effect relationship between migration and poverty and concluded that sometimes, where poverty does seem to result from migration and displacements, it is rather the result of poor policy planning…”

(International Organization for Migration, 2005: 19).

2.4 International policy context

Macro policies

The structural adjustment (SA) policies introduced during the 1980s and early 1990s has had thoroughly documented and profound effects on the rural/agricultural economies of developing countries. More recent changes in donor approaches and policies, and the emerging modality of partnerships with poor country governments, do create implementation challenges for developing countries and also signal opportunities for the rural poor. Donors have moved away from project funding to direct budgetary support. Sector-wide approaches (SWAPs), introduced at the end of the 1990s, are intended to bring coherence, partnership and consistency in programming aid. The essential modality has been for funding within a sector from all partners to support an agreed single policy and expenditure plan, led by national governments, with a common and more efficient management approach adopted by all partners.

Another innovative tool for improving the effectiveness of development aid has been the Poverty Reduction Strategy Paper (PRSP) process, whereby programmatic budget support is better aligned with country priorities. This is enhanced by donor efforts to coordinate their actions and better link budget support to the Poverty Reduction Strategy review process. PRSPs have become a condition for multilateral lending to highly indebted poor countries. In addition, the World Bank and several bilateral donors use PRSPs as the basis for their aid. The PRSP approach should be (Dijkstra, 2005):

- country-driven, involving broad-based participation;
- comprehensive, in recognition that poverty is a multidimensional phenomenon;
- results-oriented, with emphasis on concrete results for the poor;
- partnership-oriented, leading to better donor co-ordination under government leadership; and
- based on a long-term perspective.

These conditions have been met, for example, in the case of Uganda. The Poverty Eradication Action Plan, PEAP (Uganda’s PRSP), is the overall framework for reducing poverty of which the Plan for the Modernisation of Agriculture (PMA) addresses agricultural transformation (Government of Uganda, 2005). It was developed during an exhaustive (3 year) and inclusive consultation process involving farmers, input suppliers, output traders and exporters, agro-processors, civil society, policy makers, development partners and academics. Implementation is the challenge (Odwongo & Fowler, 2005).
Major national and multilateral donors have also introduced attempts to harmonise aid policies through introducing joint analytic work, preparation of common country assistance strategies and results frameworks, and joint reviews of implementation’ (World Bank). The OECD Paris Declaration on Aid Effectiveness in March 2005 was endorsed by over 100 donors and developing countries and resulted in the ‘OECD Development Assistance Committee (DAC) Guidelines and Reference Series: Harmonising Donor Practices for Effective Aid Delivery’, with baselines and suggested targets for the 12 indicators of progress. Harmonisation of donor policies and closer attention to country priorities has resulted in a new aid modality (Box 10).

**Box 10 Recent actions by donors**

```
In 2004, the European Commission proposed that a common legal framework among EU members be developed for aid implementation procedures, more coordinated multi-annual programming and analytic work. Following the Rome meeting in February 2003, the Nordic+ group [Denmark, Finland, Ireland, the Netherlands, Norway, Sweden, and the United Kingdom] formulated a Joint Action Plan for more harmonized aid delivery across all the countries where these donors work, and focused substantial attention on implementation of harmonization actions in Zambia. In April 2004, a memorandum of understanding on achieving greater aid effectiveness through harmonization was signed by the group along with Germany, the UN, and the World Bank. In December 2003, Sweden approved an integrated global development policy with harmonization as a guiding principle. In June 2004, the UN put in place a harmonized programming process among its agencies, to deliver more effective and efficient assistance aligned with national planning processes and priorities as reflected in country poverty reduction strategies, and to support sector-wide approaches.
(World Bank, undated)
```

It is too early to evaluate these changes. Nevertheless, challenges arise for the rural poor who are IFAD’s constituency. It has been argued that donor preoccupations with MDGs, PRSPs, SWAPs, General Budget Support (GBS), harmonisation, the Paris Declaration are programming approaches that favour the simple and marginalise the complicated, and fail to grapple with real uncertainty. As a policy process, SWAPs span several ministries, which is not necessarily helpful for rural development and leads to ‘the tricky bits getting ignored’ (Wiggins, 2005). The PRSP approach has limitations in flexibility and in the targeting of the rural poor, and while partnership between policy makers is evident in the modality, the inclusion of other stakeholders (particularly the rural poor) is not effective. Analysis of 15 PRSPs showed that macro policy frameworks lack the necessary flexibility to deal with external shocks and address macroeconomic volatility appropriately, and therefore do not support economic growth and poverty reduction in a clear, direct way (Gottschalk, 2005). Dijkstra (2005) is more critical about PRSPs in Bolivia, Honduras and Nicaragua (Box 11). He recommends that donors take into account the local political processes, and argues that plans should be less comprehensive, maybe subsectoral, local or regional. He also comments that donors should acknowledge that the results of aid are uncertain.
Box 11 Policies and reality

‘Aid can only be effective if the donors are serious about enhancing ownership and promoting partnership. The PRSP approach and the accompanying drive towards budget support can be seen as a desperate flight forward on the part of donor agencies in order to achieve both ownership and more donor co-ordination under recipient government leadership. However, this article has shown that the results are disappointing. PRSPs are written because donors want them to be written, and domestic ownership of the strategies is limited. Participation processes are held because the donors want them to be held, but the elected Parliaments are barely involved, the agenda is restricted to technical issues and the participation process exercises hardly any actual influence… This article has also shown that donors are creating virtual realities in which planning via PRSPs is dominant, but which bear little resemblance to the actual realities in which politics dominate…’ (Dijkstra, 2005: 461-462).

IFAD’s own ‘Report of the Consultation on the Seventh Replenishment’ (IFAD, 2005) acknowledges that PRSPs have generally not addressed adequately the role of agriculture and rural development, and that the efforts required for successful rural support strategies must be more vigorously promoted within national policy, budgeting and programming processes’ (p. 2).

These criticisms suggest that in addition to securing true participation of all stakeholders, policy targeting and differentiation according to local circumstances are necessary, and embracing risk, and possible failure, should be part of the policymaking process.

The importance of the institutional framework within which smallholders operate and in which the Green Revolutions have occurred has also been underplayed in policy analysis and new thinking is required. Kydd and Dorward (2004) argue that the failure to effectively coordinate market relations is one of the explanations for the failure of liberalisation policies, especially in very poor countries. It is argued that ‘coordination failures’ underlie the weak performance of poor countries: ‘where dramatic poverty reducing growth in poor rural economies has been achieved outside SSA it has not generally been in the context of liberalised markets, or liberalised market development’ (Dorward & Kydd, 2004: 4). A greater role for the state can be envisaged than is considered ‘orthodox’, although donors and policy makers will be hard to convince (eg agricultural inputs in Malawi, (Levy, 2005)).

Decentralisation and targeting

There are arguments that decentralised political responsibility and authority enables the flexibility to formulate context specific policies which are necessary for the transformation of local rural economy: subsidies to relieve critical seasonal credit and cash restraints, to reduce market and input supply uncertainties; and help in ‘kick-starting’ agricultural markets if increased smallholder productivity in food-grains is to drive rural non-farm growth. Establishing the base conditions for these to work, designing and implementing them to be effective, and then phasing them out are major challenges facing policymakers (Dorward, Fan, Kydd, Lofgren, Morrison, Poulton, Rao, Smith, Tchale, Thorat, Urey, & Wobst, 2004). There are three key dimensions to decentralisation (Poole et al., 2000a):

- **political power**: to what bodies will representatives be elected, what law-making powers will these bodies have, will they appoint an executive, and what powers will the executive have?
- **administrative power**: for different functions (eg health, education, infrastructure, law and order) how will the administrative and service agencies of government be organised and controlled?
- **fiscal power**: what powers of taxation and expenditure will rest with sub-national authorities, and to what extent may they be structurally dependent on funds from the centre?

An effective process of decentralisation requires reforms in all three dimensions. For example, the impact of political decentralisation may be very limited where central government continues to
control the administrative machinery of government and the agencies providing public services. Impact may be similarly limited where local government is dependent on grants from the centre, to which conditions may be attached.

A contextual analysis of the challenges and opportunities is necessary. In an article on priorities for research into tree-crop and non-timber forest production systems, Poole (2004) argues that the contextual issues are similar to those of other geographically and economically remote poor peoples who depend on perennial production systems, such as pastoralists. Targeting local development rather than global integration may bring significant benefits to marginalised peoples whose livelihoods can best be enhanced not by costly investments aimed at overcoming almost insurmountable geographical, economic and technological barriers to market access and integration into the global economy, but by investments in local assets and initiatives that decentralisation makes possible. For many reasons – geographic, cultural, social, demographic - such poverty is highly intractable, and extreme caution is needed about espousing broad policies for economic growth and market solutions for poverty reduction among the remote and marginalised peoples. Social disintegration is a consequence as likely as economic integration into the global markets (Poole, 2005b; Poole et al., 2005).

2.5 Climate change

Climate change poses perhaps the greatest threat to life on earth, and will have significant developmental consequences for all countries and economies. Effects on poor regions in developing countries are likely to be most marked. Not all impacts will be negative: ‘Overall, the world is expected to gain some 9 per cent of cropland by 2080, almost all of it located in the northern hemisphere’ (Devereux & Edwards, 2004). However, the impacts on the most vulnerable in the developing world are likely to be negative effects on the quality and quantity of water supply, higher temperatures and impacts on soil fertility (Pachauri, 2004), exacerbating the effects of population pressure and natural resource degradation. These impacts will not be gender-neutral, moreover: in rural areas, effects on the agriculture, water and rural sectors are likely to impact more severely on women. Catastrophic effects may be felt in mountainous areas through glacial meltdown (eg Bhutan), Arctic warming (Inuit populations), and in coastal areas (eg Bangladesh) and small island states (eg Pacific islands), most vulnerable to rising sea-levels and meteorological disasters. Secondary effects will be an increase in vector-borne diseases, health problems for humans and vulnerable production systems induced by heat-stress. Mapping vulnerability is the first step in anticipating local effects. ‘The lags in the entire system and cycle of changes required are significant enough to justify the adoption of the precautionary principle today for meeting possible impacts of climate change over the next quarter of a century’ (p. 14). The risk in production systems will increase as meteorological effects become more volatile and production becomes more marginal. Tertiary effects are likely to be shifts in comparative advantage in rural production systems with impacts on trade and commodity flows, and population shifts.

Potential impacts are summarised in Figure 3 (adapted from (UNEP/Grid Arendal)). In short, tropical and subtropical countries that are currently hot, dry and drought-prone will become more so. Farmers and pastoralists will be worst hit, with reduced livelihood options for the most vulnerable (Devereux et al., 2004). Mitigating actions such as attempts to control greenhouse gas emissions are mostly likely to be ineffective and insufficient. Arguing that there is a worrying ‘adaptation deficit’, Burton and May (2004) draw attention to ‘the problems of uncertainty, vested interests, wishful thinking and lack of imagination… It is not difficult to identify the obstacles to adaptation if we focus on the current adaptation deficit’ (p. 37). There must be political will.
Both institutional and technological responses will be needed to the challenges of climate change. Huq and Reid (2004) discuss adaptation to climate change (coping with the problems) as an alternative to mitigation (reducing the causes). Adaptation will be an important strategy in developing countries but awareness of the challenges is limited. Adaptation has to be specific to context, and therefore will require close attention of all stakeholders, including development NGOs, supported by research to develop indicators of change, projections of likely impact, and alternative strategies to orientate agricultural systems in general, and crop breeding in particular, to lower levels of rainfall in given areas: changes in livestock species mix (from cattle to goats); crop choice (from maize to sorghum); and overall livelihood strategy (from agriculture to migration or off-farm income diversification) (Rogers, 2004; Scoones, 2004). ‘But often, development responses… have not caught up with this dynamic. They remain stuck in a static and stable vision…’ (Scoones, 2004: 117). He argues a place for opportunism, complexity, flexibility and dynamic adaptive responses, which are not characteristics of bureaucratic responses to challenges.

Longer funding cycles by donors will be necessary if continuous learning and dialogue are to take place. Institutional innovation is also needed: climate models are too 'coarse' to depict extreme weather changes which are often locale-specific. Greater collaboration is needed between scientists, insurers and other members of the professional risk management community, governments and the disaster management community to assess and mitigate risks (Hamilton, 2004). Finding common political and economic ground between the development community and the (immensely powerful) international financial sector and energy industries presents an important challenge.

### 2.6 Key issues on challenges for the rural poor

It has been noted that rural innovation will always need to reflect various contextual factors. It is also important to note that the rural economy comprises diverse economic and other activities within an environment that affected by a range of factors. There are interrelationships among the external factors and interrelationships between the diverse elements of the different levels of the rural
economy, from individual to household to extended family, community and higher levels. Rural economy and society is a complex system of interactive elements, which both complicates analysis and understanding, but failure to recognise this are understood to restrict thinking to ‘self-limiting’ concepts of rural economy. Climate, environment, production, economic, social effects are all interrelated: climate change requires new technologies, but will also precipitate population shifts. Ignoring these interactions, contradictory and reinforcing elements will constrain innovation and development. Recognition of the complexity also opens up opportunities: ICT can improve market information, market access and efficiency of business transactions, facilitate financial intermediation, improve the delivery of health and education services and sustain social integration in the event of migration. Synergistic interventions combining efforts in several thematic areas can have good innovation potential and a good understanding of the rural economy in all its diversity is necessary.

3 Opportunities

The UN Millennium Project has identified practical strategies to eradicate poverty by scaling up investments in infrastructure and human capital while promoting gender equality and environmental sustainability. The Task Force on Science, Technology and Innovation has recently published its Report ‘Innovation: Applying Knowledge in Development’, which is an extensive account of the critical importance of knowledge and innovation for development, and what governments and international agencies should do (UN Millennium Development Project, 2005). The Report argues that the immediate problem facing developing countries is not the creation of new knowledge but efficient application of existing technologies. They recommend an innovation systems approach with integrated and supportive government innovation policies to assist the process of modifying and adapting existing technology to local contexts. Noting that an imperfection in national research systems is the isolation of many academic institutions in developing countries - a ‘loneliness syndrome’ – they comment on the importance of business and industrial enterprises as the locus at which learning of economic significance takes place. Hence industrial organisation and institutions are critical, and there is repeated mention of ‘selective industrial policies’.

3.1 Platform technologies

The thrust of the UN ‘Innovation’ Report is to focus on ‘platform’, or generic, technologies that have broad application or impacts in the economy, and these are identified as ICT, biotechnology, nanotechnology and new materials. Within the strategy, adequate infrastructure services are perceived to be a foundation for technology, and need to be accompanied by investments in education in science and technology and the promotion of technology-based business activities. Much of this, such as the innovation systems approach, and the identification of important innovation thrusts, is consistent with this report.

ICT

New IT is one such platform that has emerged from private sector commercial initiatives, not specifically for development purposes, and is having increasingly widespread effect in rural areas, and offers considerable potential to overcome some of the institutional and infrastructural constraints restraining the rural poor (UN Millennium Development Project, 2005). Many developments and applications will occur within the IT industry that cannot be foreseen. New ICT encompasses a range of technologies which are already impacting on rural areas in diverse ways, and have further potential:

- ICT plays a critical role in governance, improves people’s lives through better information flows and communication, and can enhance economic growth and income by raising productivity;
- ICT can strengthen economic and social networks by enhancing communication and exchange of knowledge and information, and can radically reduce transaction costs;
- ICT and technology ‘push’ projects are generally less effective in contributing to MDGs – instead ‘pulling’ ICT into development projects, where appropriate and relevant, will have greater poverty reduction impact;
• ICT can improve health and education services and service access through low-cost administration, information and knowledge.

There is an emerging consensus on four principal areas in which ICT can impact on development:

• stimulating macro-economic growth (reducing transaction costs, encouraging investment, creating jobs, raising revenues);
• increasing market access, efficiency and competitiveness of the poor through micro-level interventions (village payphones, improved agricultural practices through local knowledge centres such as telecentres and satellite education);
• increased interactivity, reducing ICT cost and global reach (the dramatic rise in mobile telephony and the provision or bundling of added services; and
• facilitating political empowerment through participation in planning, accountability, etc.

An interesting example of the use of IT for the benefit of rural peoples in a broader sense was recounted by Schulze (2005) whose project used video and other ICT to create understanding of the indigenous populations, demonstrating how use of mass media can be a powerful tool: PRAIA, created in 1992 through an IFAD initiative, is a regional, 9-country, Amazon basin initiative to promote the interests of 400 indigenous peoples. The modality of funding is significant, inasmuch as decisions are made on the basis of demand by the beneficiaries, and resources are transferred to the beneficiaries for disbursement.

Biotechnology
The situation with biotechnology, however, is more complex and contentious than with ICT. The potential of biotechnology for developing nutritionally-enriched crops such as golden rice and high-protein potatoes is spelt out in the Task Force Report ‘Innovation’, as well as the potential disadvantages arising from unknown gene-gene or gene-environment interactions (UN Millennium Development Project, 2005). Agricultural biotechnologies are not so easily separable from the conventional plant (and animal) breeding technologies which have been a specific innovation emerging principally from within the formal agricultural innovation system, based initially and primarily on charitable finance. Biotechnology itself has a hybrid origin: the Green Revolution has had a purposeful, massive and direct impact on the rural sector, as noted earlier. On the other hand, the use of genetic manipulation technologies to impel further evolution in agricultural productivity – a Gene Revolution - is both parallel to and continuous with the use of traditional technologies (Borlaug, 2000). Agricultural biotechnology has significant private sector resource backing from the ‘Gene Giants’ (Dupont, Monsanto, Syngenta) and elements such as terminator technologies have important implications for the rural poor, as well as the concentration of market power within the global seed market worth $21 bn (Wetter, 2005). However, the thrust of innovation is commercial, involving protective use of property rights, and commercial innovation is unlikely to be focused directly towards rural poverty.

Ten biotechnologies have been identified which are most likely to improve health in developing countries within next 5-10 years (Daar, Thorsteinsdóttir, Martin, Smith, Nast, & Singer, 2002): molecular diagnostics, recombinant vaccines, vaccine and drug delivery, bioremediation, sequencing of pathogen genomes, female-controlled protection against STDs, bioinformatics, nutritionally enriched GM crops, recombinant therapeutic proteins, combinatorial chemistry . It is likely, however, that the potential for agri-biotechnology to improve the welfare of rural people is greater than just the health improvements resulting from nutritionally enriched crops. These will be explored below.

Nanotechnology, and ‘new materials’
Nanotechnology is a third novel area with applications for poverty reduction (Box 12):
Box 12 Potential of nanotechnology

Nanotechnology offers intriguing and probably many as-yet unknown opportunities. Nevertheless, there are reasons to be cautious about the impact that nanotechnology will have on the rural poor. Their potential concerns energy production, water safety, extended life of car tyres and other substances. Therefore, it is possible that the market for natural fibres such as cotton and other agricultural commodities such as rubber will be threatened (Wetter, 2005).

Finally, new materials are being developed out of increasing knowledge of the mechanical, electronic, ionic and nuclear properties of a wide range of materials. There may be many applications for developing countries, including exploitation of renewable energy sources.

3.2 Specific information technologies

Applications to resource monitoring, management and forecasting

Spatial analysis tools and geographical information systems technology (GIS) can be linked with socio-economic data and permit the mapping and identification of resources, poverty, market ‘domains’ and other features of the natural social and economic environment. New techniques for poverty and food security mapping lend themselves to the identification of problems and the targeting of policies and interventions at the ‘local’ scale. Hyman et al. (2005) summarise a series of studies of poverty and food security mapping in Bangladesh, Ecuador, Kenya, Malawi, Mexico, Sri Lanka and Vietnam and expound the benefits for policy development in agricultural and rural areas.

Mapping techniques have potential to bring about productivity improvements in natural resources systems. Current GIS applications in advanced agricultural economies enable the specification of appropriate production technologies and inputs at the level of the micro-environment of individual farms and fields such that output is enhanced, input use rationalised, and the negative environmental externalities reduced. It is likely that such technologies can be adapted to benefit the rural poor in developing countries. Applications of GIS are already being used to map marine resources and facilitate harvesting by fishing communities.

GIS systems are already in use for tsetse control purposes and other applications will surely be developed. Information technology will also have a greater role for disseminating meteorological data to farmers and planting, cultivation and harvesting conditions as production conditions become more uncertain due to climate change.

‘Nanotechnology is the study, design, creation, synthesis, manipulation, and application of functional materials, devices, and systems through control of matter at the atomic and molecular levels and the exploitation of novel phenomena and properties of matter at that scale…

‘Nanotechnology is likely to be particularly important in the developing world… Cost-effective agricultural applications of nanotechnology could decrease malnutrition, and childhood mortality, in part by increasing spoil fertility and crop productivity. Crop health can be monitored using nanosensor arrays. Nanosensors can raise the efficiency of crop monitoring activities. Sensors applied to the skin of livestock or sprayed on crops can help detect the presence of pathogens. Nanoporous materials such as zeolites, which can form well-controlled stable suspensions with absorbed or adsorbed substances, can be employed for the slow release and efficient dosage of fertilizers for plants and of nutrients and drugs for livestock… Other applications can promote health, improve water and sanitation, enhance the development of renewable energy sources, and improve environmental management… Nanobiotechnology, the convergence of nanotechnology and biotechnology, can be harnessed to enrich biodiversity…’

(UN Millennium Development Project, 2005: 70-74).
ICT for marketing and finance

Nevertheless, innovative technologies such as new ICT can be used and abused by the research and development community to repeat the mistakes of formal innovation systems, but in a more costly and high-technology way. Technology alone is not a solution. An example in the making could be RESIMAO (Box 13), which appears to have fundamental problems. Another initially promising example of a successful information network targeting the interest of local people was the Gyandoot community network in Madhya Pradesh, India, but which has recently collapsed (Kelles-Viitanen, 2004, 2005).

Box 13 MIS-directed enthusiasm for technology

Following the structural adjustment-induced redesign of West African cereal boards at the end of the 1990s, RESIMAO (Réseau des Systèmes d'Information de Marché de l'Afrique de l'Ouest) is a network of market information systems for West Africa which was launched in 2000 in Bamako, Mali, now serving 9 Francophone and Anglophone countries (Dossouhoui, 2005). The primary function is regular price data collection for a range of crops in hundreds of national markets (estimated final total 600) which is undertaken primarily by national public sector staff. Data currently available on the internet sites are maps, regional price averages and locations, prices for the last 4 days, and network facilities to plot dates and analyse trends (Knipschild, 2005). The intention is to use diverse media for dissemination – GIS, internet-based systems, bulletins, radio, TV and SMS. One of the partners is MISTOWA (Market Information Systems for Trader Organisations in West Africa), a 4-year regional project begun in 2004 and implemented by IFDC and mainly funded by USAID. Its aim is to strengthen the capacity of farmers and traders to access and use the data, with the ultimate aim of promoting agricultural trade in the ECOWAS region (Annequin, 2005a, 2005b).

MISTOWA (Box 13) uses technology created by Busylab, a Ghana-based software firm and developer of Tradenet (tradenet.biz). This dedicated software is currently available in 13 countries: 10 in West Africa, 2 in Central America, and Uganda (Davies, 2005). The software enables users to access web-based market services: offers, transport, storage and market news, in addition to prices, by commodity, region, country or market. The involvement of the private sector software firm is an innovative approach to establishing a regional trading platform. Nevertheless - and although it is too early to analyse the programme - this ‘second generation MIS’ initiative appears to be a donor-driven MIS repeating many of the historic problems, but using modern IT. It seems to lack forethought about data processing and analysis, identifying and targeting users, and the possible commercial value of the system to potential users: ‘MISTOWA does not claim [to be] reaching out directly to the smallholder in West Africa. However, the project is offering to a host of actors surrounding the smallholder “raw” market information that can generate new services and especially ensure the dissemination of processed information that can generate new services and especially ensure the dissemination of processed information on the “last kilometre’’’ (Annequin, 2005a). Ownership of the network seems diffuse, and currently there does not seem to be a policy on how to ensure sustainability at the end of the funding period. Even the requirement to use English appears to be a response to the needs of the donor-funder, USAID (Davies, 2005).

Information and communications technology is undoubtedly having a massive impact in developing countries. Liberalisation has led to a dramatic expansion of radio services in many developing countries, with content often well-targeted to local users. There are many initiatives to put in place new ICT such as internet access, satellite, cellular and mixed information and communications technologies. Some of these initiatives derive from donors, such as the Rockefeller-funded Kenyan Agricultural Commodities Exchange, KACE (Adesina, 2004; Mukhebi, 2005). Dramatic increases in the level of connectivity in telephone connectivity have occurred since the liberalisation of the telecommunications sectors in many developing countries that have permitted the expansion of cellular networks (Azam, Dia, & N’Guessan, 2002; Barendse, 2004; Haggarty, Shirley, & Wallsten,
These are mainly private sector initiatives that have responded to a liberal economic environment, but the NGO sector has also set up viable and innovative technological and organisational networks (Box 14).

**Box 14 Grameen successes**

Grameen Telecom (GTC) is a not-for-profit company dedicated towards extending ICT amongst the rural people of Bangladesh. The corporate vision is to provide telecommunication services to the 100 million rural inhabitants in the 68,000 villages in Bangladesh. Grameen Telecom holds a 35% share in Grameen Phone Ltd., the company which was awarded a nationwide license for GSM 900 cellular mobile phone services. Grameen Bank plays a vital role in implementing and expanding the Village Phone program. It provides necessary organizational & infra-structural support to Grameen Telecom. There are technological problems in reaching the more remote areas, such as signal fluctuation, and also the need for energy sources for charging batteries. Nevertheless, plans include expansion of the Village Phone concept and Village Telecom Centers.

\[3\]

http://www.grameen-info.org/grameen/gtelecom/

Whole new economic sectors have opened up that are sources of micro-enterprise, employment and revenue. An innovative example is the development in Ghana of tradenet.biz, by Busylab, a dedicated software platform for market information systems that is now in use in 13 countries, using ‘southern brains’ (Davies, 2005). Although many ICT initiatives have been driven by north-based multinational companies, it is argued that innovative partnerships are needed between diverse stakeholders – mobile operators, local private sector, financial institutions, government and regulators, donors, NGOs and civil society - to meet local challenges to increase access to technology and develop local applications (Scott, Batchelor, Ridley, & Jorgensen, 2004).

Doubts persist about the extent and speed of rollout of new technologies to remote areas with low populations and difficult terrain, and also about the inequity effects that may result (Duncombe & Heeks, 2002; Forestier, Grace, & Kenny, 2002; Kenny, 2002). Partial rollout will serve to increase the ‘digital divide’ with the poorest being disadvantaged again, and policy makers and the private sector need to be attentive to pro-poor ICT rollout to approach universal coverage and meet the Millennium Development Goals. Anecdotes abound which illustrate the dramatic effect of increasing information and communications in many countries (Box 15). Nevertheless, there are few detailed studies of the socioeconomic impacts of ICT in poor areas: Vodafone commissioned a series of studies in Egypt, South Africa and Tanzania which showed how mobile phones can improve aggregate economic growth, quality of life and social capital\[3\].

Doubts persist about the extent and speed of rollout of new technologies to remote areas with low populations and difficult terrain, and also about the inequity effects that may result (Duncombe et al., 2002; Forestier et al., 2002; Kenny, 2002). Partial rollout may serve to increase the ‘digital divide’ with the poorest being disadvantaged again, and policy makers and the private sector need to be
attentive to pro-poor ICT rollout to approach universal coverage and meet the Millennium Development Goals.

**Box 15 ITC anecdotes**

| In Zambia a street market vendor is paying for his order of Coca-Cola by text message. In Tanzania a candidate in the Presidential elections has been awarded his degree after completing it online through distance learning. In Nairobi, a daughter is sending money to her father in rural Kenya with prepaid ‘pay as you go’ airtime. And in Namibia schoolchildren are surfing the net, sending emails and writing essays thanks to FLOSS, open source software written by enthusiastic programmers who don’t want any payment’ |


The phenomenon of ‘flashing’ is now very widespread in Africa: one cellphone user (often a rural user or employee) makes an unanswered call to another phone (sometimes a trader, or urban-based friend or family member, or employer) whose owner calls back enables low cost connectivity for the rural user. Flashing is one mechanism increasingly used for advancing credit and making payments.

More sophisticated systems such as MALSWITCH in Malawi use biometric data systems, swipe cards, mobile technologies and cash dispensers (often located at commercial points such as petrol stations) to make rapid and safe financial transfers. The potential of the system to make the rural credit system in poor rural areas is becoming evident (Box 16).

**Box 16 ICT and the MALSWITCH card**

The card can be used for deposits at participating agents, and can be credited through the banking system by employers, buyers of agricultural produce etc. Withdrawals are made via ATMs which are equipped with fingerprint scanning, the network of which is expanding very fast, often using wireless communication. MALSWITCH can be used for funds transfer between card holders. MALSWITCH is being promoted strongly to smallholder cash crop farmers: one produce buying company is going into the field with MALSWITCH staff to register farmers. Registration is said to take 3 minutes per farmer and the cost is nominal.

For produce buyers the MALSWITCH card is a major benefit as it is no longer necessary to carry cash to rural areas, avoiding major logistical and security challenges. Furthermore, MALSWITCH accepts ‘stop-orders’, which allow creditors to withdraw funds, if a credit agreement is registered. The scheme is accessible to other banks in Malawi, and one micro-finance organisation, the Opportunity International Bank of Malawi (OIBM), has already begun issuing a MALSWITCH card with its own sub-brand. BP has introduced a MALSWITCH fuel card, which is useful to transport companies for controlling fuel expenditure (point of sale is documented) and also enhances security as drivers do not have to carry cash. Presently MALSWITCH depositors do not receive interest, but as more banks join, it can be anticipated that interest bearing accounts will be offered to larger depositors.

(Kydd, J., 2005, personal communication).

There is a widespread view that no single technological approach can meet the complex needs of development opportunities in diverse situations. The appropriate mixes of old and new ICT for the generation and provision of marketing information, for example, may include various elements from traditional billboards, radio, internet and telephone systems (Bertolini, 2004). For rural credit and payments systems, cellphones are already being widely used
3.3 Agricultural systems

Increasing agricultural productivity has been directly linked to poverty reduction (Irz, Lin, Thirtle, & Wiggins, 2001; Thirtle, Lin, & Piesse, 2003). There is still scope, therefore, for investments to improve agricultural output and productivity in many CDR areas, although care must be taken to focus research into areas of productivity growth that do not simply result in surpluses that reduce prices and returns to smallholders. Lipton (Lipton, 2005) argues for further research into transgenic crops to improve the yield-characteristics of African staple crops but warns that because research in applied biotechnology is largely privately owned, exploited and motivated – perhaps 90% of work is conducted by a few big companies - the main staples have remained ‘Cinderellas’ of research. Public-sector research in China represents important exception.

A more radical approach is to make poverty-oriented research by private companies profitable, not mainly by private royalties of farmers or PR spin-offs, but by competitive public contracts to achieve specific outcomes. Property rights need to be handled to enable pro-poor dissemination. In India, the plant protection system enables the farmer to save, use, sow, resow, exchange, or share the seeds of protected varieties, besides offering protection on farmers' variety, extant variety and essentially derived variety. While patents prevent further research, a *sui generis* system adopted by India benefits both the farmers and the breeders, and diffusion is possible.

There is an urgent need also for a ‘Blue Revolution’ in basic water science and engineering to address the critical constraints arising from the growing unreliability of rainfall patterns due to climate change. Appropriate water management that takes into account the diversity of socio-political environments in Africa will need locally appropriate institutions (Movik, Mehta, Mtisi, & Nicol, 2005).

Biodiversity conservation and indigenous knowledge

Respecting and building on indigenous knowledge is critical for partnership and sustainability, *inter alia*, and likely to be of particular value to rural peoples in areas which retain a biodiversity. Non-timber forest products (NTFPs) constitute the single largest determinant of livelihoods for scores of forest fringe communities and poor people in the tropics. In India over 50 million people are believed to be directly dependent upon NTFPs for their subsistence. However, such human dependence on NTFPs for livelihood gains (win) has most frequently been at a certain ecological cost. Research in Karnataka reported by Shaanker *et al.* (2004) demonstrated that adaptive management that enhances the ecological knowledge bases of harvesting communities and that regulates the market structure to favour long rather than short-term gains could narrow the disparities between livelihood gains and the ecological cost of NTFP-dependence and thus lead to a greater livelihood security to the poor communities. Among the potential interventions and possible recommendations, they suggest the extension of ecologically friendly methods of harvesting, spatial and temporal monitoring of harvesting by collectors, formulation of property rights that are aligned with incentives for long-term management, and harvesting regimes that are not exploitative of the collectors and the ecosystem. There is a strong argument for making effective the concept of local, participative forest working plans, and semi-domestication of at least the most important and threatened plant resources, requiring involvement of a wide range of stakeholders (Gauthier & Poole, 2003).

Similarly Johnson (2005) cited the example of linking Senegalese harvesters of *karaya* gum (an exudate of *Stercularia setigera*) with an exporter (Setexpharm) as an example of market development that has led to more sustainable exploitation of a perennial natural resource.

The challenge of climate change has been highlighted earlier. Technical advances in agricultural techniques have potential to ameliorate the effects of climate change. Nevertheless, technical advances may be low- rather than high-tech: Haggblade and Tembo (2003) report on a conservation farming system which has been promoted actively by a growing coalition of stakeholders (private sector, donors and government) in Zambia since 1996. According to a recent survey the hand-hoe system increased maize yield on average by 1.5 tons per hectare by enabling early planting with first
rains, improved water harvesting, more effective input use, and increased fertiliser use and use of high yielding varieties. Farm budget analyses suggest that hand-hoe conservation farming outperforms conventional tillage, generating higher returns to both labour and land.

Addressing a similar African problem, that of address soil degradation, De Jager (2005) argues that participatory approaches in agricultural research and extension have achieved impressive results in isolated cases but have not delivered the large-scale change in practice necessary to reverse the aggregate decline. In this case, indigenous technologies have not reversed the trend in soil fertility decline, and proved insufficient to support population growth. ‘New technologies’ are needed, especially external nutrient inputs but with an awareness of appropriateness to local context in terms of market access and complementary services. This highlights the importance of ‘context’: establishing interactive land-user-science-policy triangles at various scales may require a greater emphasis on policy influence and institution building than on technology development.

Beyond productivity: entrepreneurship

Yield enhancing technologies are of undoubted importance, and yet adding output can lead to oversupply: ‘investments aimed at increasing agricultural productivity need to be linked to market opportunities if they are not to depress commodity prices and farm incomes’ (Diao, Dorosh, & Shaikh Mahfuzur Rahman, 2003: vi). Productivity must be considered within the market context and researchers, policy makers and NGOs are facing the challenge to the research focus towards improving profitability and competitiveness of small-scale farming, and linking smallholder farmers to more profitable markets (Sanginga et al., 2004). In Uganda, the approach of Enabling Rural Innovation (ERI) offers an integrated approach for demand-driven and market-oriented agricultural research and rural agro-enterprise development.

The Participative Market Chain Assessment (PMCA) developed at the International Potato Center (CIP) in Peru (Bernet et al., 2005; Devaux, 2005) regards innovation as a participatory and market-oriented process that involves diagnostic research including all stakeholders, identification of potential business opportunities, and development of market innovations such as new products, technologies and institutions. The rural poor who are the immediate beneficiaries assume greater responsibility and authority as the process unfolds.

Market opportunities

Traditional exports

Demand-driven product development is essential for any agribusiness, and working with the rural poor to meet market demands is challenging. Notwithstanding the barriers due to higher agrifood and ‘corporate’ business standards, and given appropriate support in achieving these higher standards, there are opportunities in international agrifood product markets for poor rural producers. Traditional export crop prices will continue to decline (Diao et al., 2003) but opportunities exist if these higher standards are met. Value can be added by differentiating commodities to exploit remunerative niche products by marketing the comparative advantage of many rural production systems in low input, or organic production, or fair trade, employing environmentally sound and socially equitable production and marketing practices.

Exotic exports

Once again, a comparative advantage of many remote rural areas may be the sustainable management and production of exotic and naturally occurring genetic materials: niche markets for indigenous can be exploited because of their comparative advantage in sustaining biodiversity, building on protection of designated origins and novelty to consumers (Devaux, 2005).

Domestic markets and regional trade

Domestic markets also present opportunities, especially with the prospect of population growth, particularly in Africa. In spite of the growth of supermarkets, opportunities are likely to persist for
good quality food staples, even for displacing the 25% of food grains which are imported (Diao et al., 2003). Enhancing productivity of domestic production must be matched by complementary investments in transport and communications infrastructure. This is especially important to develop intra-south regional trade, especially in Sub-Saharan Africa, as regional liberalisation creates the possibility of greater market integration.

**A caveat about market opportunities**

Jones (2005) has drawn attention to the large scale of investments required in agricultural productivity in order to have the necessary impact on poverty reduction in Africa. He cites the development of floriculture in Kenya as an example of what is possible with access to investment funds, technologies and enabling policies: in 11 years the cut-flower industry has become Kenya’s single biggest export earner, accounting for 60 per cent of total earnings from horticulture, 8 per cent of Kenya’s total export revenues, employing 100000 people directly and 200000 indirectly. He continues, ‘the Kenyan floriculture example must be emulated many times and extended to smallholders and pastoralists for there to be any hope of meeting the 6 per cent growth target set by the Forum for Agricultural Research in Africa (FARA) and the New Economic Partnership for African Development (NEPAD)…’ (p. 47).

The scale of investment needed in agricultural research and development in African countries - and in other poor rural areas - is not in doubt, but the mode of investment is important. Public funds may be necessary to invite participation by private capital; but it will be wrong to make large public investments that crowd out private funds, or that are made in ventures that the private sector considers commercially unviable. Caution is necessary not about large investments *per se*, and the need for complementary and coherent enabling policies is assumed. However, the rural poorest are unlikely to benefit if NEPAD’s Comprehensive African Agricultural Development Programme were to mean ‘comprehensive and integrated, continental-scale programmes’ that failed to take into account the principal lessons about innovation and opportunities in economic development for the poor in marginal rural areas: focused, flexible, context-specific, demand-driven initiatives, and the inherent obstacles to replication and upscaling.

**Non-farm economy**

Much research has been conducted on the importance of the non-farm rural economy (NFRE) in recent years. Diversification into activities within NFRE has been recognised as an important means of increasing incomes and reducing risk for farming smallholders, and creates opportunities for capturing added value and creating additional employment. Many non-farm economic activities are linked to the agricultural sector and generation of off-farm activities is also a strategy for raising the farm sector. The multiplier effects of agricultural development, and the integrated nature of agriculture with the NFRE and local labour markets, point to the importance of rural entrepreneurship and a dynamic local economy for achieving the MDGs. Stimulating rural business development must be a high priority for improving the livelihoods of the rural poor, and will require policy makers to move beyond fears of intermediary enterprises as stereotyped ‘exploiters’ of the rural poor: ‘the key to successful distribution models is to allow the middleman to make a buck’ (Alan Knott-Craig, CEO, Vodacom, quoted in Vodafone SIM Research).

Rural peoples’ assets are not only linked to farming. IFAD has recorded notable success in business projects in Peru both for agriculture-based products – knitwear (Blas Ramos, 2005) and unrelated enterprises – tourism (Camino Moron, 2005). Using an innovative competitive funding approach, it is evident that such activities that reinforce the cultural assets – a sixth category in addition to the

---

4 Vodafone footnote *op. cit.*
pentagon of the conventional livelihood framework – have both economic potential and build up the capital assets of rural peoples (Simoni, 2005). The importance of learning from such examples has been highlighted elsewhere (International Fund for Agricultural Development, 2005). For indigenous groups such as the Andean communities, the social and cultural benefits have the potential to strengthen the peoples’ identity at the same time as forge links to the outside environment (Poole, 2005b).

**Post-harvest institutional innovations and staple foods markets**

**Cereal banks**

Innovative approaches to poverty reduction are increasingly likely to involve post-harvest practices, particularly a combination of institutional and technical innovations for storage, handling and exchanging rural produce. Staple food product markets are perhaps the single most important sector to be targeted for poverty alleviation. Improving efficiency not only in production but also in storage, transport, processing and exchange has potential to boost producer incomes, food security, and consumer welfare. Apart from technological developments and infrastructure, institutional innovations (and sound public policies) are important to make markets work. In Kenya, Woomer and Mukhwana (2004) adopted an approach which assumed that investment in new technologies and integrated technology approaches would occur in response to improved profitability and market access. The outcome was an innovative maize marketing approach in the form of ‘cereal banking’. Farmers form their own marketing associations to inspect, bulk, store and trade maize. The cereal bank enables farmers to reduce post-harvest losses and store maize until prices are good, to secure premiums for better quality maize and to sell further down the supply chain. The bank also serves an important food security function by selling small quantities of stored maize to individual and schools during the hunger period. In the best case so far cereal bank associations were able to increase member maize marketing profits by 68% by selling directly to Nairobi millers.

**Warehouse receipts**

There is a growing body of work on warehouse receipts as a mechanism to bulk produce and store under sound conditions, and to link output marketing to finance through inventory credit systems. Warehouse Receipt (WR) systems use ‘documents issued by warehouse operators as evidence that specified commodities of stated quality and quantity, have been deposited at particular locations by named depositors (Coulter & Onumah, 2002: 323). Many international inspection companies have been operating ‘collateral management agreements’, providing principally large-scale importers and exporters access to credit through non-transferable receipts issued directly to banks by inspection company/warehouse operator. The system has potential to:

- facilitate impersonal trade by reducing information asymmetries and commodity assembly at stated location;
- improve spatial and temporal arbitrage and reduces distribution margins;
- enable producers to defer crop sales by obtaining inventory credit for post-harvest consumption needs - thus obtaining higher output prices;
- reduce seasonal price variability and provide conditions for the development of more sophisticated price insurance instruments such as futures and options; the system also benefits net-consuming smallholders not participating in the system through lower food prices in critical hunger periods and higher sale prices immediately after harvest;
- reduce post-harvest losses;
- improve access to rural finance by providing smallholders with collateral and reducing lenders transaction costs;
- enable more cost-effective management of public food reserves.

Coulter (2005) acknowledges the need for an awareness of the political economy and the institutional environment, which must be propitious: an innovation such as WR requires an established legal
framework, but at the same time needs distancing from political processes which tend to have short time-horizons. To ensure viability, WR, like other market innovations, should be led by the private sector rather than by donors, NGOs or the public sector.

Other innovative institutions have been cited earlier in the paper, such as commodity exchanges and elaborate ‘New ICT-drive’ market information systems. At the moment it is too early to evaluate these experiences, but a cautious approach is necessary in the absence of evidence that these projects have the potential to become sustainable, especially where they are donor-inspired and funded. Attractive models will adopted and developed by the private sector, if they have not already been developed – or obviated – by private sector initiatives. Others will fail.

**Farmer organisations**

After decades of negative experience with cooperatives in developing countries, there has been a resurgence of interest in farmer organisations (FOs), which are once again perceived to have a role in filling the marketing gap that exists as a result of both market failure and public sector failure: a gap in the provision to the rural poor of services in agricultural input supply and credit, product assembly and marketing. Often with the support of NGOs, FOs are also perceived to have a role in the provision of technical advisory services, human resource and organisational capacity building. Advocacy, giving ‘voice’ to the poor, is another aspiration for the FO sector. However, there is very mixed record: notable successes, and many failures, such that policy makers and practitioners need to have realistic and clear expectations of FOs as a solution to the pressing problems of the rural poor.

Nevertheless, one of the consensus views at the IFAD Innovation Mainstreaming Initiative workshop (‘What are the Innovation Challenges for Rural Development?’ Rome, 15-17 November 2005) was that it is essential for farmers to be organised in order to engage effectively in markets where high quality, ‘commercialisable’ quantities of agrifood produce, demonstrable standards, low transaction costs and value-adding services are preconditions of market access (Box 17):

**Box 17 Offuman Garden Egg Farmers’ Association, Ghana**

The Offuman Garden Egg Farmers’ Association was established through Tom Ahima, the 1987 national best farmer. The church-based Association comprising about 400 members has more women than men, in the ratio of 3:2. At the peak of harvest (November) there are about 10 to 15 trucks loaded with garden egg leaving Offuman for Accra, Takoradi, Cape Coast and other destinations in the country each harvesting day.

The main function of the group is price negotiation with buyers from all over the country. The group also negotiates for tractor services, beating down prices to the level affordable by each member of the group. The major factor that has kept the group together is successful marketing (to market cooperatively and also to gain market power), but belonging to the group also gives members some sort of security. The group fosters good relationships with traders, who provide farmers with information such as preferred varieties and knowledge of market factors such as planting times and types of garden egg grown elsewhere. Quality standards are set by farmers and traders together. The executives inform traders about the available quantity of garden egg and based on this the traders bring the right size and number of bags and vehicles. Other benefits derived are the organisation of input supplies, training in production techniques, development of local agribusinesses, and investment in local infrastructure.

The Association does not provide production finance, and this, together with the high level of group coherence, is regarded as one of the principal reasons for success.

(Poole, Seini, & Heh, 2000b)
Recent research in Malawi suggests that FOs can undertake a range of functions, but there are many caveats: ‘… FOs generally need external support to get going, but getting the balance right between external and internal resources, between accountability and leadership, between flexible and effective structures, and between over and under ambition means that FOs and their supporters walk a difficult set of tightropes. External support needs to be skilled, sensitive, consistent and patient …’ (Chirwa, Dorward, Kachule, Kumwenda, Kydd, Poole, Poulton, & Stockbridge, 2005: 1). Arnesen et al. (2002) also note the limitations of FOs, including the frequent failure to meet the needs of the poorest, and offer similar cautionary notes about the role of outside agencies. Citing IFAD experience with group formation across SADC, they note the fundamental problem of group cohesion in a context where most economic activity is organised along lines of the extended family group, and see a greater role for NGOs in group formation due to their better social development skills. It may be that experience from the advent of ‘new generation cooperatives’ (NGC) could help develop more sustainable farmer-controlled agribusinesses in developing countries (Cook & Iliopoulos, 1999). There is potential for linking FOs into supply chains through institutional arrangements such as contract farming and outgrower schemes (Coulter et al., 1999).

3.4 Energy

The provision of energy is one means of improving the quality of life to rural peoples, giving access to technologies such as ICT that may otherwise be unavailable. Energy is also likely to be essential for generating improvements in the non-farm rural economy, permitting processing and other activities, and also mechanisation of otherwise burdensome tasks. Lack of infrastructure and high costs are frequently cited as explanations for rural energy poverty but there are also many social, economic and political obstacles. Lack of explicit recognition of these obstacles underlies these weaknesses in Sub-Saharan Africa, and effective participation of potential consumers in decision-making fora is necessary (Sebitosi & Pillay, 2005). As noted earlier, current prices of petroleum and its derivatives are likely to have negative effects, and the provision or rural power with conventional technologies is likely to become more costly and problematic. The social and environmental benefits of the development of energy services other than petroleum products are obvious.

Sagar (2005) argues that improving energy services for poor households in developing countries remains one of the most pressing challenges facing the development community. The dependence of these households on traditional forms of energy leads to significant health impacts as well as other major disbenefits, yet there has been little progress in meeting this challenge. There is need for an ‘energy-poverty alleviation’ fund to help provide modern energy services to these households. Investment is needed in alternative energy sources ‘beyond petroleum’ for reasons besides environmental imperatives and economics: renewable sources of electricity such as wind and solar power are technically feasible for local markets in rural, even remote areas, where connection to larger networks may be particularly costly and scale economies are potentially lower than with other forms of power generation. Bahaj (2002) recounts experiences and sketches approaches for enhancing the prospects of utilising solar energy, arguing that the recent rate of development of photovoltaic cells has been exceptional.

Any developments into more sophisticated technology such as fuel cells will be equally beneficial. Secondly, the possibility of producing source material for bio-energy sources should also be explored. Sugar cane and rapeseed oil may be feasible crops for bio-energy production in rural areas, although the energy balance for biofuel production is unpersuasive. New crops may also be developed that are suitable for rural production in developing countries. Thirdly, sources such as methane from waste is another potential source for local energy supplies. Omer and Fadalla (2003) give an account of how biogas from biomass has considerable potential in Sudan. After reviewing the ecological, social, cultural and economic impacts of biogas technology, they suggest that biogas technology must be encouraged, promoted, invested, implemented, and demonstrated, and especially for remote rural areas.
3.5 Regulatory environment

In the UN Report cited earlier (UN Millennium Development Project, 2005), there is repeated mention of ‘selective industrial policies’: ‘Developing countries need to participate more actively in international trade to acquire technological and other capabilities. Doing so does not mean that they need to completely liberalize their economies; selective industrial policies are still necessary to foster domestic technological capabilities. Global trade rules should be differentiated to take into account the different needs of countries of varying levels of development’ (p. 7).

Local enterprises and economies may need protection through selective industrial policies at the local level. A framework that restrains anti-competitive market structures and strategies and promotes efficient and effective exchange is likely to be an important tool in nurturing the ‘infant markets’ and ‘infant economies’ in which the poor need to engage. Concepts of ‘safety nets’ and ‘cargo nets’ are used to address the need for welfare interventions, and asset or benefit transfers. As markets grow, as in developed market economies, unfettered market exchange is unlikely to be equitable. Competition policy can serve as another type of ‘net’, that is to say, a ‘shark net’, by constraining anti-competitive practices such as horizontal and vertical agreements and the exercise of monopoly power or other coercive forces that may be anti-poor (Poole, 2005a).

An appropriate regulatory model to both promote markets and constrain anti-competitive activity will take into account the burden of regulation that is known to hinder economic activity in developing – and other – countries (de Soto, 1989). Unwise and over-regulation are responsible for the informalisation of markets, and lower productivity, more corruption and unemployment, and reduced fiscal resources (World Bank, 2004). Nevertheless, the response to wrong regulation is not ‘no regulation’ but ‘right regulation’, maybe even preferably ‘self-regulation’. Further investigation is needed into how decentralisation can create opportunities for local and sectoral initiatives to protect and promote pro-poor institutional development (Poole, Seini, & Heh, 2003).

An appropriate model is likely to differ from the policy framework of advanced economies (Box 18). For example, the test of competitiveness may not necessarily be loaded towards the consumer interests of low prices and wide product range and high quality, but towards the poor producers.

**Box 18 Appropriate competition policies**

‘Competition law and policy, in appropriate forms, are beneficial, including to developing countries. However, each country must have full flexibility to choose a model which is suitable, and which can also change through time to suit changing conditions. Having an appropriate model is especially important in the context of globalisation and liberalisation where local firms are facing intense foreign competition. In particular, developing countries must have the flexibility to choose the paradigm of competition and competition policy/law that is deemed to be more suitable to their level of development and their development interests.’

(Third World Network, 2003).

One area where this approach is especially important is biotechnology, the regulatory challenges of which were highlighted earlier. Newell and Mackenzie (2004) argue that international governance of biotechnology requires location-, environment- and context-specific interventions, including enhanced use of competition law to combat monopolisation and restricting the application of broad patents. This is related to issues of property rights to genetic materials found in rural areas of developing countries.

Traditional knowledge (TK), innovations and creativity, including ‘folklore’, have received increasing attention in numerous policy areas, ranging from food and agriculture, the environment, health, human rights, and cultural policy, to trade and economic development. TK systems are important in the achievement of sustainable development and maintaining biodiversity. Protection of TK is also important for social, cultural and economic reasons, particularly perhaps in developing and least
developed countries. The World Intellectual Property Organisation (WIPO) was mandated in 1998 to undertake exploratory groundwork in order to provide an informed and realistic analysis of the intellectual property aspects of traditional knowledge and folklore protection. WIPO is now developing draft legal mechanisms and a range of practical tools aimed at enhancing the intellectual property interests of the holders of such knowledge, resources and expressions.

4 Development and innovation

4.1 Emerging thinking

Rural poverty is heterogeneous and context-specific, livelihood systems are diverse and dynamic, and operations need to be flexible and demand-led, responsive, unprogrammed and risky. If accounting and econometrics have been the disciplines of modernity, then poverty reduction is ‘post-modern’, neither universal nor absolute, and needs a more varied disciplinary toolbox. Because poverty reduction is not just more $s a day, evaluation needs to be more broadly based; if poverty is self-defined, then evaluation needs to be conducted against beneficiaries’ criteria. Non-economic measures need to be added to the traditional economic tools of IRR and RoR (Clark, Hall, & Suleiman, 2003; Hall et al., 2003).

Scoones (2004) outlines emerging perspectives and implications for development thinking (Table 1). These emerging views are consistent with the preceding analysis and implications of the challenges and opportunities for the rural poor.

Table 1 Emerging views in development thinking

<table>
<thead>
<tr>
<th>THEME</th>
<th>CONVENTIONAL VIEW</th>
<th>EMERGING VIEWS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Livelihoods and resource management</td>
<td>Single use, sectoral view of resources as commodities</td>
<td>Multiple users, complex and diverse livelihoods</td>
</tr>
<tr>
<td>Institutions</td>
<td>Static, rule-based, formal, clear boundaries, fixed, exclusivity</td>
<td>Dynamic, overlapping, heterogeneous, socially defined, emergent from adaptive practice, flexible</td>
</tr>
<tr>
<td>Legal frameworks</td>
<td>Formal legislation: fixed rules and procedures</td>
<td>Evolving law in practice, multiple systems, legal pluralism</td>
</tr>
<tr>
<td>Development planning and policy</td>
<td>Blueprint approach Linear policy model</td>
<td>Adaptive planning, flexible, responsive, learning</td>
</tr>
<tr>
<td></td>
<td>Science as arbiter, single source of authoritative knowledge</td>
<td>Non-linear policy: negotiation, adaptation, discretion key</td>
</tr>
<tr>
<td></td>
<td>Conflict, dissent and debate underplayed</td>
<td></td>
</tr>
<tr>
<td>Knowledge/power</td>
<td>Measurable risks and predictable outcomes Assumptions of ‘normal’, ‘standard’ patterns</td>
<td>Uncertainty and ignorance Temporal variability and spatial diversity</td>
</tr>
<tr>
<td>Risk and uncertainty</td>
<td>Separation of levels: local v global Rules and formal institutions of governance</td>
<td>Integration of levels: multi-level governance, messy interactions, negotiation of outcomes</td>
</tr>
</tbody>
</table>

(Scoones, 2004)

5 http://www.wipo.int/tk/en/
Bezanson (2004) argues that the traditional and dominant paradigm of development as ‘linear, measurable predictable, and subject to the universal treatment of economic theory’ (2004: 128) needs rethinking. A range of factors impel this: social systems around the globe under severe strain, the primacy of science and technology as determinants of development, new understanding of the interrelations ‘between human beings and the physical and biological world’ (p. 129), opportunities arising from new platform technologies: ICT and knowledge management, biotechnologies and evolutionary control, nanotechnology, and possibly others to come. He stresses above all the reality and pervasiveness of ‘interdependence’, ‘the rise of local initiatives as people and communities around the world demand more control over their lives...’ and ‘...the growing realisation of the importance of knowledge and innovation’ (p. 132 – italics in original).

Key pointers
It can be argued that current donor mechanisms are unlikely to meet the needs of the rural poorest whose interests are likely to be underrepresented in support designed under PRSPs within SWAPS, financed through GBS. Building on the apparent consensus and summary of the IFAD workshop in November, key pointers to future policy are:

- From livelihood assets pentagon to hexagon: embrace broadly defined ‘culture’ as a critical livelihoods asset;
- Learning: organisational learning should be enhanced by analysis of success stories;
- Identification: mapping the rural poor and understanding the heterogeneity of poverty;
- Focus: rural development strategies should be targeted towards specific and local conditions;
- Flexibility: funding instruments should be flexible and focused on local scale constraints;
- Evaluation: performance should not be measured solely or primarily by economic criteria;
- Targeting: targeting the poorest involves higher transaction costs in the identification of the poorest, and in the monitoring and evaluation of portfolio which includes smaller, specialised projects;
- Longer time-frames: longer timeframes are needed to permit development to occur;
- Risk: risk-taking in innovation-support policies is likely to increase the failure rate as well as the chances of successful innovation;
- Upscaling and replication: specificity means that there may be limited economies to be gained in upscaling, and the result of a sharpened focus is that replicability of successful interventions is problematic, and the requirement for upscaling and replicability needs to be addressed with careful analysis;
- Field presence: in-field staff and expertise are required;
- Policy inconsistency: conflicting tendencies between a standardising ‘international development architecture’ and the need for focused, flexible responses to context-specific challenges and opportunities defined by rural poorest.

These elements endorse the recent Action Plan (IFAD, 2005: 9-14). This approach does require innovation in policy thinking and an acknowledgement of the ‘fundamental disconnect’ (Olsson, 2005) that exists between the formalised and standardised ‘international development architecture’ and the approaches necessary to reach the rural poor. The innovation systems approach is consistent with the need for institutional innovation and the need for building human capacity, which could be termed human resource innovation. This report also strongly endorses the systems approach, built as it is on broad and deep analysis of innovation for rural development. There is need for innovative partnerships in development and the potential is growing. Some (limited) examples are:
• NGOs such as WWF are linking with Vodafone⁶;
• Unilever have linked with OXFAM to explore whether international business investment helps or hinders the fight against poverty (Financial Times, 2005);
• CELTEL, the African mobile operator is considering research with Imperial College London into poverty-reduction effects of mobile telephones and pro-poor rollout strategies;
• IFPRI, together with Imperial College London, is leading a group of CGIAR organisations in an initiative to develop continuing professional development training course materials for poverty reduction in developing countries. This is a potential avenue for linking IFAD’s own knowledge management system with other stakeholders in rural poverty reduction.

The UN system can and should explore such opportunities for strategic alliances with leading international firms, and develop constructive relationships with local organisations and enterprises.

Box 19 Potential for UN system partnerships

‘Many of the R&D activities of the UN system address the needs of the poor. But the United Nations often lacks the requisite institutional arrangements that would help translate research knowledge into goods and services. Links with other institutions, particularly those in the private sector, are generally weak. The CGIAR, for example, has not been able to establish effective and durable links with the parts of the private sector that hold the key technologies needed to advance agricultural production. Much of the challenge lies in different research cultures and the character of public sector funding upon which the system relies. Meeting these challenges will require more emphasis on designing institutional arrangements that allow for greater linkages between UN research and private sector activities.’

(UN Millennium Development Project, 2005: 167).

4.2 Role of IFAD

IFAD must continue to build on its comparative advantages, and avoid duplicating the efforts of other international organisations. Identifying some defining features of IFAD, the Report of the Consultation on the Seventh Replenishment of IFAD’s Resources emphasises its unique role. Compared with other IFIs, IFAD ‘functions far more through direct linkages with farmers’ groups and associations and through grass-roots change in socio-economic systems aimed at improving rural and agricultural livelihoods and increasing rural incomes’ (IFAD, 2005: 3).

Table 2 summarises areas of activities that the author of this report suggests that IFAD should consider. There should be an open mind about other issues that have fallen outside the scope of this paper.

---

⁶ Vodafone footnote op. cit.
### Table 2 Rural opportunities and strategies

<table>
<thead>
<tr>
<th>DIRECT: OPPORTUNITIES TO SUPPORT</th>
<th>STRATEGY</th>
<th>MECHANISMS/OUTCOMES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Production technologies</td>
<td>Increased productivity &amp; efficiency in CDR regions, Conservation of resources</td>
<td>New varieties, New tillage practices, Water management, Biodiversity conservation</td>
</tr>
<tr>
<td>Overcome market access barriers</td>
<td>Improved quality through standards setting &amp; regulation, Supplier capacity building</td>
<td>Demand orientation, Supply of appropriate quantities &amp; qualities</td>
</tr>
<tr>
<td>New market opportunities</td>
<td>Niche export markets, Develop regional trade in staple foodstuffs</td>
<td>Exploitation of unique/comparative advantages in supply, Local economic multiplier effects</td>
</tr>
<tr>
<td>Institutional &amp; marketing arrangements</td>
<td>Supply chain linkages, producer organisations &amp; network building, Reduced transaction costs, Supplier concentration &amp; power, Achieve scale efficiencies</td>
<td>Develop business relationships, Supply chain efficiencies, Strengthen identity &amp; social empowerment</td>
</tr>
<tr>
<td>Rural energy</td>
<td>Alternative sources, Alternative products</td>
<td>Value addition, Local economic multiplier effects, New products</td>
</tr>
<tr>
<td>INDIRECT: ACTIONS TO ADDRESS</td>
<td>CATALYTIC ROLE IN PROVISION OF:</td>
<td>PARTNERSHIPS</td>
</tr>
<tr>
<td>Agricultural research</td>
<td>Technologies for CDR regions with social &amp; climatic stresses</td>
<td>CGIAR &amp; NARS, Commercial biotechnology firms</td>
</tr>
<tr>
<td>Rural infrastructure: roads &amp; energy</td>
<td>Transport communications to improve input &amp; product logistical efficiencies, Energy</td>
<td>Local &amp; national government, National &amp; global private sector energy firms, International donors and IFIs</td>
</tr>
<tr>
<td>Information &amp; communications systems</td>
<td>Information &amp; communications infrastructure to enhance provision of market(ing) information &amp; financial services</td>
<td>Local &amp; national government, National &amp; global private sector telecoms &amp; finance firms</td>
</tr>
<tr>
<td>Selective industrial policies</td>
<td>Protection of infant industries &amp; local economies, IPR for ITK &amp; rural genetic resources</td>
<td>National governments &amp; international trade &amp; other organisations (eg UNCTAD, WIPO, NGOs)</td>
</tr>
<tr>
<td>Lobbying &amp; advocacy</td>
<td>Reshaping policy processes for pro-poor focus</td>
<td>Donor &amp; development community, National governments, Mass media</td>
</tr>
</tbody>
</table>

### 4.3 Organisational considerations

**Human and organisational resources**

The concept of ‘organisational fit’ (Korten, 1980) is helpful here. Innovation means novelty, new things being done, or old things being done in new ways. This presupposes opportunities, vision, risk-taking and resources. These values must be shared by organisations and their staff, and both must be entrepreneurial. Entrepreneurial organisations have particular characteristics in terms of culture and personnel. There must be a fit between culture, structure, resources and the tasks. It is clear that IFAD needs to be entrepreneurial within if it is to promote innovation without. Entrepreneurial management within a mature organisation that is strategically, structurally, organisationally and financially
consolidated is challenging at all levels. Managers must be ‘intrapreneurs’ (Wickham, 2004): entrepreneurial managers who work within the confines of a mature organisation, but with vision, embracing novelty and risk-taking. The models developed by Korten and Wickham have been adapted and included in Box 19. The model is self-explanatory to a degree such that it may prove helpful even without further communication. The final slide maps elements of the evolving Action Plan (IFAD, 2005) onto IFAD’s ‘entrepreneurial fit’.

Box 19 Organisational ‘fit’ and ‘fitness’

Focus and model

The failure of development efforts to address the needs of the poorest – say the poorest quintile who will still be poor and probably in rural areas when the MDGs are met (Poole, 2005b) – leaves the field open for a rural-oriented organisation with agriculture as a core activity and with learning and enterprise as core operating values. A serious challenge remains to reconcile a) the emergent development and thinking and key pointers such as those concerning focus, flexibility and failure outlined in section 4.1, and b) the financial and economic performance assessment criteria of the dominant ‘international development architecture’.

The model for delivery of finance may need to be reconsidered in conjunction with the broader operating model. There is an importance to delivering not just finance but undertaking also for the provision of complementary business and human development services. There is an advocacy role to catalyse the international public and private sectors in the provision of services that fall outside the IFAD remit. IFAD can be an advocate for the rural poorest among international public sector organisations and the private sector, and a forum for dialogue with other non-governmental players. Delivery of services at field level within this more entrepreneurial approach needs consideration of greater in-country capacity and field knowledge. Effective organisational learning presupposes a forum within IFAD such as the new electronic rural poverty portal (Enweze, 2005) and/or regular participation in wider fora that enables wider ‘learning from success’. This is consistent with the need for an organisational ‘knowledge management’ strategy both within IFAD and in relation to IFAD’s
diverse partners. The apparent IFAD success of competitive tendering for financial resources (Simoni, 2005) is an element of that needs further and more widespread testing. This process has been mirrored in other grant-making programmes. There is a need for funding at an early stage in the innovation process, that is to say, in problem identification and invention, as well as in the development and dissemination of innovations. Where competitive funding systems are appropriate, it will be necessary also to consider how to support those who fail in the tendering process.

The appropriate balance of loans and grants may need to be considered further, especially if consideration were given to another novel idea, equity financing. By providing investment finance in the form of equity, a financial institution provides capital in return for a share in ownership and profits, and some level of management, of a new venture. Various advantages might be expected: a) an equity financing approach for a proportion of new project initiatives has potential to increase awareness of the inherent risk and return elements in financing development; b) a gradual move towards equity investment would assist in reducing debt distress; noting the commitment of IFAD to integrate innovation, knowledge sharing and learning into the ‘corporate planning and monitoring system, as well as into the performance evaluations of all relevant staff…’ (Enweze, 2005), equity financing is a mechanism that could also c) provide an innovative and appropriate incentive structure both within IFAD for identifying needs of the rural poor and potential solutions, d) increase organisational commitment to provide technical and business support and direct engagement between IFAD and its client base, and e) introduce new methods of performance assessment. In operating at what would probably be described as a microenterprise scale, IFAD could learn from other developing country equity financing operations without causing unnecessary duplication. Any of these initiatives would have important implications for the intermediary (public sector) partners through whom IFAD historically has worked.

7 The Maendeleo Agricultural Technology Fund (MATF) is a regional fund operating in East Africa and seeks to promote the transfer of new agricultural technologies to farming communities by supporting innovative partnerships for the transfer of tested and proven innovative technologies in crops, livestock, and post-harvest processing and marketing. MATF was established by the Rockefeller Foundation (USA) and the Gatsby Charitable Foundation (UK), and has been operating in East Africa since January 2002. The fund is managed by FARM-Africa. http://www.maendeleo-atf.org/.

8 See http://www.act.is/ and http://www.act.is/focus/smces.asp. Actis is a private equity investor in emerging markets and has its origins in CDC Capital Partners. Actis is most active in Africa, China, Malaysia and South Asia. Actis also invests in SMEs, through Aureos, a joint venture company with Norfund, the Norwegian Investment Fund for Developing Countries.
References


Exchanges: Strengthening Market Signals and Institutions, 28-30 November. Amsterdam, the Netherlands: Technical Centre for Agricultural and Rural Cooperation ACP-EC (CTA).


Appendix: IFAD, innovation and the rural poor: TOR

The main objective of the paper is to:

i) inform on the new challenges and opportunities – both internal and external – (coming from globalised market penetration, ICT, privatisation and weakening of state services, democratisation and decentralisation, climate change etc.) faced by poor rural people that require new pro-poor innovative approaches, processes and interventions in the following areas:

- Rural assets of the rural poor (reflecting multiple livelihoods)
- Technology and knowledge to benefit the rural poor
- Access to markets and rural enterprises by the rural poor
- The role of the ICTs for poverty reduction
- Sustainable natural resource management in the interest of the rural poor
- Any other area that emerges as important area during the study

While each topic should be covered, the consultant is free to choose the topics which will be covered in more detail. With brief description of examples of interesting pilots and innovative efforts where available.

ii) present selected pro-poor innovations according to the outline, noting that pro-poor for us means innovation with the poor (and not just for the poor) addressing their concerns and building their own knowledge into innovations;

iii) highlight new partnerships and institutions required for the pro-poor innovations where available;

The paper should be guided by the following background assumptions. (Some of these could also be questioned with evidence to the contrary):

i) Only innovations with the rural poor (as described above) would be successful in reducing rural poverty;

ii) Rural innovation will always need to reflect various contextual factors (regional, national, geographic, economic, social, cultural etc.) to be effective;

iii) Local culture, rural identity and know-how are to be considered assets in development and not just as impediment;

iv) Rural actors’ abilities to initiate and innovate are not to be underestimated;

v) It is important to question traditional and self-limiting concepts of rural economy;

vi) It is important to consider sustainability of farming and natural resources management rather than just look at productivity concerns;

vii) The innovation and rural development processes are complex by nature: they result from the interaction of many diversified and complementary actions, coordinated by different actors;

viii) Innovation potentials and good practice will be probed in various thematic areas but at the same time synergistic interventions combining efforts in several thematic areas can have good innovation potential;

ix) Innovations function in an environment which is not value neutral. Decision-making processes are the result of power, knowledge and information relationships. Institutional environment, that supports innovations with, by and for the poor is, therefore, an essential element of success;

x) Innovation always disrupts the ‘established rules’ and plans, and as adoption of innovation is rarely consensual, the innovation process needs to be managed with (institutional) strategies, good governance and new partnerships.