

# **ENHANCING COORDINATION AMONG AKIS/RD ACTORS:**

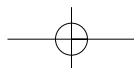
## **AN ANALYTICAL AND COMPARATIVE REVIEW OF COUNTRY STUDIES ON AGRICULTURAL KNOWLEDGE AND INFORMATION SYSTEMS FOR RURAL DEVELOPMENT (AKIS/RD)**

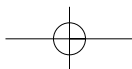
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FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS  
Rome, 2005





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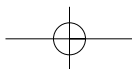
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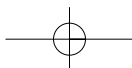
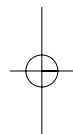
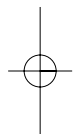
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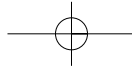


# EXECUTIVE SUMMARY

The Extension, Education and Communication Service and the Research and Technology Development Service of the Food and Agriculture Organization of the United Nations (FAO) conducted ten case studies on Agricultural Knowledge and Information Systems for Rural Development (AKIS/RD) in different countries with a view to gaining insights into the operations of these systems, the countries' efforts at integrating their AKIS systems, and the lessons learned. The present study reviews and analyses these case studies, comparing them against a number of indicators, including the nine principles set forth in the seminal text published by FAO and the World Bank in 2000: *AKIS/RD: Strategic vision and guiding principles*. An AKIS/RD is the entire complex of agencies and institutions that provide rural people with the knowledge and information necessary for promoting innovation in their diversified livelihoods. It can be considered equivalent to an "enhanced AKIS" in that it incorporates both agricultural and non-agricultural knowledge and information services.

An AKIS/RD exists in some form in all areas, as rural people have traditional – as well as modern – sources of information relevant to their livelihood strategies. In practice, government technical agencies play an important role in promoting innovation and modernization and providing services to rural producers. Agricultural production systems are at the heart of most rural economies and rural livelihood systems, but non-agricultural income and social services are also critically important in many cases. Public sector investment is typically channelled through independent agricultural research, extension and education agencies – AKIS/RD agencies. These together form the core of public sector AKIS/RD investment and influence the development and efficiency of all public and private sector efforts to promote innovation and enhanced competitiveness in the agriculture sector.

The present study is organized into seven main sections. The introduction, Section 1, sets out the purpose of the study, discusses AKIS/RD vision and principles, defines the agricultural knowledge and information components of an AKIS/RD as a set of (sub)systems that, ideally, are effectively linked and purposely integrated, defines agricultural development as an aspect of rural development, and reviews selected literature and events that refer to AKIS/RD. Section 2 provides an overview of the ten case studies, ranking them against 24 indicators (covering nine basic and 15 additional principles) organized within five broad priority areas: 1) AKIS policy environment; 2) institutional structure for the support of innovation; 3) conditions that support the expression of demand for innovation; 4) partnerships and networks that contribute to the effectiveness of an AKIS/RD; and 5) the finances available to support systems of innovation. Section 3 examines the common strengths and weaknesses relevant to AKIS/RD in the ten country case studies and highlights the innovative features of various case studies. Section 4 reviews the lessons learned, as outlined by the national consultants who prepared the case studies. Section 5 establishes guidelines for strengthening AKIS/RD; and Section 6 draws brief conclusions.



## THE COUNTRY CASE STUDIES

The ten country case studies were written by national consultants who reviewed documents and other secondary data, undertook rapid appraisals, developed questionnaires, carried out group and individual interviews with key informants and, in some cases, held workshops and seminars to gather data on their countries' AKIS institutions and the status of these in terms of the AKIS/RD strategic vision and guiding principles. The case studies were produced between 2000 and 2003, and both quantitative and qualitative data were utilized. (See Annex 2 for an example of the consultants' terms of reference [TOR]).

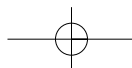
The countries studied differ with respect to economic status, type of government, institutional structure, organizations' management approaches, and the relationship between public AKIS/RD institutions and private sector entities, including agricultural producers and their organizations. Case studies generally provide data on agriculture; agriculture's relation to national gross domestic product (GDP); the government structure as it relates to public sector agricultural research, education and extension institutions; the operation of public sector institutions; and the role of private sector companies, NGOs and agricultural producers and their organizations.

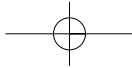
## THE CONCEPT AND PRACTICE OF AKIS/RD

The AKIS/RD concept and practice hold significant promise for the advancement of agricultural and rural development and, more generally, national economies. The case studies underline the importance of formulating an AKIS/RD policy that promotes the development and interaction of the agricultural knowledge triangle of AKIS (sub)systems and the idea that several main actors (agricultural educators, extensionists, researchers, the private sector, and farmers) can interact with each other for their mutual benefit in advancing agricultural and rural development. In short, while an AKIS/RD policy sets the stage for institutional practice, the concept of AKIS/RD needs to be understood, nurtured and expounded.

Once an AKIS/RD policy has been established, the next step is to draw up a strategic plan for the best direction and approaches to developing an integrated AKIS/RD. In order to realize the value and importance of the AKIS/RD concept, agricultural institutions need actively to promote linkages, technology transfer, knowledge sharing and the exchange of relevant information. And such an impetus to the development of pluralistic innovation systems must be supported by adequate financial commitment. Fundamental to the development of an AKIS/RD is recognition of the role of a plethora of private sector actors (seed and input supply companies, produce buyers, chemical companies, radio and television, etc.) playing different roles within the system.

As the case studies point out, there are various funding sources other than the State. For example, funds for AKIS/RD may be acquired from the local communities that benefit from agricultural knowledge and information, public and semi-public corporations, private estate farms and trade organizations, sundry cess arrangements for exportable goods, rural producer organizations and individual producers. Research, extension and education must stop competing with each other for limited government resources and begin to strengthen linkage mechanisms that will improve the flow of technology to agricultural producers.





Only governments can create the conditions necessary for developing AKIS/RD. Investment in market development and support to input providers, especially credit and supply institutions, can stimulate the agricultural community, and rural physical infrastructure makes the environment attractive and safe. Agricultural producers, including women and poor farmers, require education and training to bring them into the modern world of labour-saving technologies and more productive practices. Joint planning between producers and institutional operators can provide the platform for advancing a demand-driven system of technological innovation for agricultural development.

System managers require training to improve their understanding of the dynamic nature of both national and international technology systems, and to identify better those areas where the public system has a comparative advantage over private sector research and development (R&D) firms. First, the publicly funded technology system needs to focus more attention on sustainable development activities that will maintain the natural resource base of each nation, as well as on R&D activities that are not likely to be undertaken by the private sector. The public sector needs to give greater attention to intensifying and diversifying the farming systems of small-scale farmers, in order to increase the productivity and incomes of farm households, slow rural-urban migration and conserve the natural resource base. Additionally, public research and extension systems must develop more active partnerships with farmers' organizations, private sector firms and non-governmental organizations (NGOs) so that technology assessment and transfer can be undertaken in a coordinated and effective manner. Partnerships require that each institution concentrates on those activities where it has a comparative advantage, while jointly planning and implementing activities where the goal requires concerted action.

Effective networks, including organizational mechanisms and communication technologies, foster partnerships. Computer technology, online and interactive mechanisms have a huge potential to expand AKIS/RD. Investments are needed to support the enabling of the private sector and, in particular, to encourage rural producer organizations. The commodification of agricultural knowledge has gradually become a reality, which means that agricultural producers must begin to recognize the value of information and share in paying for it.

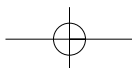
Ultimately, the adoption of AKIS/RD as a nationwide concept and general practice depends on each government's interest and determination to foster agricultural knowledge and information for the contribution that it can make to the national economy and, more particularly, to growth and equity in the rural sector.

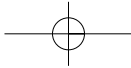
## **THE GUIDELINES**

Section 5 puts forward 25 guidelines for strengthening and advancing AKIS/RD. These guidelines can be summarized as follows:

### **1. Policy environment**

- 1.a Formulate a national AKIS policy, plan or formal agreement.
- 1.b Direct AKIS policy toward public goods issues.
- 1.c Assess the economic efficiency of the agriculture sector, given AKIS.





## ***2. Institutional structure for supporting innovation***

- 2.a Establish AKIS/RD units.
- 2.b Institute central and branch supervision of AKIS activities.
- 2.c Take initiatives to build the capacity of each AKIS institution.
- 2.d Decentralize decision-making to lower levels of government and relevant local organizations, while training people at these levels in the processes of management and administration.
- 2.e Augment the functional performance of AKIS entities.
- 2.f Institute systems for monitoring, evaluation and impact assessment.
- 2.g Ensure coordination and joint planning among AKIS institutions.

## ***3. Conditions for expressing demand for innovation***

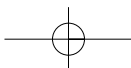
- 3.a Promote demand-driven orientation in relevant public programmes.
- 3.b Invest in agricultural market development.
- 3.c Improve the availability of and access to agricultural inputs.
- 3.d Invest in rural physical infrastructure.
- 3.e Mandate joint planning among AKIS agencies.
- 3.f Invest in the education and training of agricultural producers to enable them to demand services effectively.
- 3.g Promote gender equality and vulnerable groups' access to services.

## ***4. Partnerships and networks***

- 4.a Design structures for effective institutional cooperation.
- 4.b Promote public-private partnerships (and institutional pluralism).
- 4.c Insist on programme participation by agricultural producers and rural producer organizations.
- 4.d Promote effective use of traditional communication technologies.
- 4.e Invest in computer/Internet and other modern information technologies.

## ***5. Financing systems for innovation***

- 5.a Ensure adequate funding for AKIS/RD.
- 5.b Promote repartition of costs.
- 5.c Explore various types of investments to develop stakeholder capacities.



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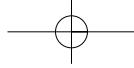
*Original design of the study including detailed terms of reference for the country studies, technical supervision and follow-up, review of draft reports of country study reports, review and preparation of the present publication:* M. Kalim Qamar, Senior Officer (Agricultural Training & Extension), SDRE, and Henry K. Mwandemere, Senior Officer (National Agricultural Research), SDRR.

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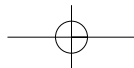
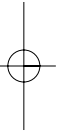
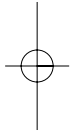
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- Malaysia: Malcolm Hazelman, Senior Agricultural Extension, Education and Communication Officer, FAO Regional Office for Asia and the Pacific, Bangkok
- Uganda: M. Kalim Qamar, Senior Officer, SDRE; Vera Boerger, Agricultural Extension, Education and Training Officer, FAO Sub-Regional Office for Southern and Eastern Africa
- Pakistan: M. Kalim Qamar, Senior Officer, SDRE
- Lithuania: R. Krell, Research Information Management Officer, FAO Regional Office for Europe



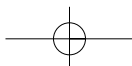
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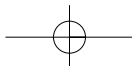
# ACRONYMS

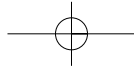
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<b>ADB</b>	African Development Bank
<b>AIS</b>	Agricultural Information System(s)
<b>AKIS</b>	Agricultural Knowledge and Information System(s)
<b>AKIS/RD</b>	Agricultural Knowledge and Information System(s) for Rural Development
<b>AKS</b>	Agricultural Knowledge System(s)
<b>AP</b>	Agricultural producer(s)
<b>ARKIS</b>	Agricultural and Rural Knowledge and Information System(s)
<b>CAAES</b>	Central Administration for Agricultural Extension Services (Egypt)
<b>CBO</b>	Community-based organization
<b>CDD</b>	Community-driven development
<b>CGIAR</b>	Consultative Group on International Agricultural Research
<b>CIAL</b>	Local Agricultural Research Committee (CIAL)
<b>CIAT</b>	International Centre for Tropical Agriculture
<b>CIP</b>	International Potato Center
<b>CIRAD</b>	International Cooperation Centre of Agricultural Research for Development
<b>DANIDA</b>	Danish International Development Agency
<b>DPA</b>	Provincial Department of Agriculture (Morocco)
<b>EC</b>	European Community
<b>FA</b>	Farmers' Association (Malaysia)
<b>FAO</b>	Food and Agriculture Organization of the United Nations
<b>FRD</b>	Education, Research, Development (Morocco)
<b>FOA</b>	Farmer Organization Authority (Malaysia)
<b>GDP</b>	Gross domestic product
<b>HRD</b>	Human resource development
<b>HRM</b>	Human resource management
<b>ICRISAT</b>	International Crops Research Institute for the Semi-Arid Tropics
<b>ICT</b>	Information and communications technology
<b>IFAD</b>	International Fund for Agricultural Development
<b>INDAP</b>	National Institute for Agricultural Development (Chile)
<b>INIA</b>	National Institute of Agricultural Research (Chile)
<b>IPM</b>	Integrated pest management
<b>IRAD</b>	Institute of Research and Agricultural Development (Cameroon)
<b>ISNAR</b>	International Service for National Agricultural Research
<b>MADRPM</b>	Ministry of Agriculture and Rural Development (Morocco)
<b>MALMR</b>	Ministry of Agriculture Land and Marine Resources
<b>MALR</b>	Ministry of Agriculture and Land Reclamation (Egypt)
<b>MARDI</b>	Malaysia Agricultural Research Institute
<b>MINAGRI</b>	Ministry of Agriculture (Cameroon)



<b>MINREST</b>	Ministry of Scientific and Technical Research (Cameroon)
<b>MOA</b>	Ministry of Agriculture (Malaysia)
<b>NAADS</b>	National Agricultural Advisory Service (Uganda)
<b>NAMDEVCO</b>	National Marketing Development Company (Trinidad and Tobago)
<b>NAP</b>	National Agricultural Policy (Malaysia)
<b>NARO</b>	National Agricultural Research Organization (Uganda)
<b>NARS</b>	National Agricultural Research System(s)
<b>NGO</b>	Non-governmental organization
<b>NSI</b>	National System for Innovation
<b>OECD</b>	Organisation for Economic Co-operation and Development
<b>ORMVA</b>	Regional Office of Agricultural Development (Morocco)
<b>PARC</b>	Pakistan Agricultural Research Council
<b>PARL</b>	Pilot Area Real Life projects (Pakistan)
<b>PDES</b>	Economic and Social Development Plan (Morocco)
<b>PMA</b>	Plan for Modernization of Agriculture (Uganda)
<b>PNVRA</b>	National Programme for Agricultural Extension and Research (Cameroon and Morocco)
<b>PSDA</b>	Project to Support Agricultural Development (Morocco)
<b>PTTB</b>	Basic Technology Transfer Programme (Chile)
<b>PTTI</b>	Integrated Technology Transfer Programme (Chile)
<b>R&amp;D</b>	Research and development
<b>RBDIC</b>	Rural Business Development and Information Centre (Lithuania)
<b>RPO</b>	Rural producer organization
<b>RREC</b>	Regional Research and Extension Council (Egypt)
<b>SDRE</b>	Extension, Education and Communication Service (FAO)
<b>SEA</b>	Agricultural Extension System (Cuba)
<b>VERCON</b>	Virtual Extension Research and Communication Network
<b>WFS</b>	World Food Summit





# 1. INTRODUCTION

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## PURPOSE OF THIS STUDY

The present study provides a preliminary response to the question: How can developing countries encourage the various systems, organizations and producers concerned with agricultural research, education and extension, and operating in the public or private sector, to behave as one system with regard to the agricultural development component of rural development? In other words: What do developing countries need to establish and maintain an Agricultural Knowledge and Information System (AKIS) that targets agriculture – broadly conceived as crops, livestock, fisheries and forestry – as a main component of rural development (RD)? Cases studies on the present status and direction of AKIS/RD in ten countries are reviewed and compared with a view to providing preliminary answers to this question.

Following the publication of a joint FAO/World Bank document on *AKIS/RD: Strategic vision and guiding principles* (2000),<sup>1</sup> the Food and Agriculture Organization of the United Nations (FAO) commissioned case studies of AKIS/RD in various countries. The case studies were based on almost identical Terms of Reference, and set out to discover the extent to which an AKIS/RD vision and principles were being pursued. The case studies were carried out over the period 2000 to 2003 by national consultants in Cameroon, Chile, Cuba,<sup>2</sup> Egypt, Lithuania, Malaysia, Morocco, Pakistan, Trinidad and Tobago, and Uganda. In addition to gathering data on interventions that have contributed to the development of AKIS/RD in these ten countries, FAO also held national workshops on AKIS/RD in four of them – Malaysia, Pakistan, Trinidad and Tobago, and Uganda. The Organization also plans to hold an international technical meeting on AKIS/RD at some later date.

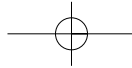
The ten country case studies on AKIS/RD cover various regions: South Asia, North Africa, East Africa, West Africa, the Americas, and Eastern Europe. They also fall into three distinct economic categories as defined by the World Bank's World Development Indicators for 2003: *low-income* (Cameroon, Pakistan and Uganda); *lower middle-income* (Cuba, Egypt and Morocco); and *upper middle-income* (Chile, Lithuania, Malaysia, and Trinidad and Tobago). While each consultant received almost the same Terms of Reference, every case study is distinct for the reasons already mentioned, and also because the status of AKIS/RDs and the issues that confront them differ from case to case.

The present study highlights unique or innovative steps undertaken in the countries to strengthen AKIS/RD, assesses the commonalities among the countries, compares the strengths and

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<sup>1</sup> See Web site: [www.fao.org/sd/exdirect/exre0027.htm](http://www.fao.org/sd/exdirect/exre0027.htm).

<sup>2</sup> In fact, two studies were conducted in Cuba, one on AKIS/RD and the other on urban agriculture programmes.



weaknesses that emerge in each case study, and reviews the lessons learned as underscored by the consultants. On the basis of this synthesis of experiences from the ten countries, the study puts forward a preliminary set of normative guidelines for advancing AKIS/RD.

## **ORGANIZATION OF THE STUDY**

The study is organized into six main sections, beginning with the present Introduction. The second section discusses the ten country case studies in terms of their different stages of AKIS and AKIS/RD development. Its Table 2 identifies 24 criteria that are utilized to rank each country's commitment to the advancement of AKIS/RD and/or the actions that countries have taken to promote this. These 24 criteria are organized into five main categories: 1) policy environment; 2) institutional structure for supporting innovation; 3) conditions for expressing demand for innovation; 4) partnerships and networks; and 5) financing systems for innovation. The original nine principles outlined in the FAO/World Bank document are handled under these five main categories.

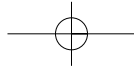
The third section examines the strengths and weaknesses relevant to AKIS/RD in the ten country case studies, in line with the five main categories and the 24 criteria. It then goes on to highlight innovative features in the various country studies, and these again are organized according to the main categories. The fourth section presents lessons learned regarding AKIS/RD development in each of the countries, as expressed by the national consultants.

The fifth section provides guidelines for strengthening AKIS/RD, drawing on the case studies and their recommendations; this discussion is also based on the five main categories. Section 6, the conclusion, "from idea into action", summarizes the present study and its implications for advancing AKIS/RD in developing countries. Following the conclusion, References list the country case studies and the books and articles utilized in developing the present study. Finally, the Annexes include, among other things, condensed profiles of the ten countries whose case studies form the basis for the present study on AKIS/RD.

## **THE AKIS/RD VISION AND PRINCIPLES**

Agriculture's challenge is to achieve the integral goal of being productive, profitable, sustainable and non-polluting. The AKIS/RD challenge is to help make this happen. The catalyst for the present review was the joint FAO/World Bank (2000) publication on developing a strategic vision and guiding principles for AKIS/RD. This brief document (20 pages) outlines a vision, strategies and guiding principles for designing AKIS/RD systems. The main purpose underlying the document is to promote rural development by reducing poverty, promoting gains in agricultural productivity, and ensuring food security and environmental sustainability in developing countries. It sets out the following four main operational purposes:

1. To set forth a shared vision for an integrated approach to agricultural education, research and extension that would respond to the technology, knowledge and information needs of millions of rural people, helping them to reach informed decisions on the better management of their farms, households and communities.



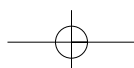
2. To facilitate dialogue with decision-makers, in both government and development organizations, ensuring that proposals for investment in AKIS/RD are well founded and receive due consideration.
3. To provide the staff of FAO and the World Bank, and their counterparts in client countries, with a common set of principles to guide their work in agricultural education, research and extension.
4. To ensure synergies from complementary investments in education, research and extension, resulting in more effective and efficient systems.

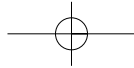
The strategic vision underlying the FAO/World Bank document is focused on rural people, especially farmers, pastoralists and those who eke out a living from forestry or fishing – in the present study, these people are referred to generally as "agricultural producers". Although some current trends emphasize off-farm and other-than-farm income sources (AgREN E-Discussion 2004), most rural people depend directly or indirectly on agriculture for their livelihoods.

The FAO/World Bank document proposes a strategic vision for an AKIS/RD that: 1) accurately identifies the constraints and opportunities facing male and female farmers and herders and their wider communities, through engaging scientific methods to generate appropriate and sustainable economic, social and technological responses; 2) helps rural people, particularly farmers, to gather the social skills and technologies needed to augment their productivity, manage their natural resources sustainably, raise their incomes, collaborate effectively with one another in addressing their common problems, and become effectively involved with other stakeholders in determining the process of further technology generation and adoption; 3) enables governments to carry out activities for the public good – for example, ensuring food safety, conserving the environment, reducing poverty, and promoting education, research and extension, whether from public or private suppliers; and 4) provides education and continuous training and mutual learning opportunities for educators, researchers, extensionists and farmers alike, allowing them to work together effectively.

The FAO/World Bank document lays out nine guiding principles, which are intended to assist in achieving the AKIS/RD objectives of poverty reduction, agricultural productivity gains, food security and environmental sustainability. These guiding principles are:

- economic efficiency;
- careful matching between the comparative advantages of organizations and the functions they perform;
- subsidiary;
- clear repartition of costs;
- careful assessment and optimal mixing of funding and delivery mechanisms;
- pluralistic and participatory approaches;
- effective linkages among farmers, educators, researchers, extensionists and other AKIS/RD stakeholders;
- building human and social resources;
- sound monitoring and evaluation (M&E).





The question then is how best to realize this vision and apply these principles. To respond to this question, the present study reviews the commonalities, lessons learned and recommendations put forward in the case studies. It also adds 15 other factors that appear essential to the successful development of AKIS/RD. On the basis of this examination, a number of normative guidelines are put forward for consideration.

## **FROM AKIS AGENCIES TO AN AKIS TO AKIS/RD**

### **AKIS and AKIS/RD**

A successful institutional system is more than the sum of its parts (Rivera and Schram, 1987b; Röling, 1989). A set of institutions becomes a "system" when its individual components are interlinked or articulated, and the separate institutions are connected so that they communicate and cooperate in action to share their human, physical and financial resources in order to achieve one or more common goals.

### **AKIS agencies**

In most countries, modern agricultural development efforts started with the establishment of research, extension and agricultural education institutions. These were frequently stand-alone research institutes, universities and extension services that, in theory, maintained linkages with each other to promote the development and transfer of new technologies to farmers. However, linkages among the institutions were often weak, while those with the clients (e.g. farmers) were even weaker. Overall performance was far below expectations, which led to a need to move beyond independent AKIS agencies in order to promote rural innovation more efficiently and effectively.

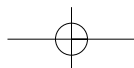
### **The AKIS "knowledge triangle"**

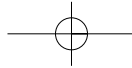
Endeavours to articulate the set of knowledge systems, or subsystems of agricultural research, extension and education, into an AKIS are not new. Indeed, the literature is replete with books and articles on linkages and linking of the three major agricultural knowledge systems. (In this study, these systems will henceforth be referred to as "subsystems", as they are considered parts of a larger AKIS framework aimed at improving agriculture within a general concern for rural development.)

In addition to the initiatives taken by FAO and the World Bank, the Organisation of Economic Co-operation and Development (OECD) held a major conference in 2000,<sup>3</sup> which brought together directors and representatives of agricultural research, agricultural advisory services and higher education in agriculture to discuss what is termed Agricultural Knowledge Systems (AKS). In September 2003, the World Bank held a workshop for Eastern European and Central Asian countries in Tbilisi, Georgia to discuss the overall reform of AKIS, while focusing on the sustainability of Competitive Grant Programs (World Bank, 2003b).

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<sup>3</sup> Paris, 10 to 13 January 2000. See Web site: [www1.oecd.org/agr/aks/index.htm](http://www1.oecd.org/agr/aks/index.htm).





The original diagram to illustrate AKIS/RD<sup>4</sup> (Figure 1) simply highlights the three basic institutional components of AKIS/RD and the central purpose of the system – to serve farmers, whom in this document are more aptly referred to as “agricultural producers”.<sup>5</sup> The illustration does not point to other entities involved, such as government, the private sector, civic society, support systems, markets, etc. nor does this simplified diagram recognize the importance of AKIS/RD to users and beneficiaries other than rural producers. In addition, it implicitly emphasizes the importance of agriculture for rural development; even though it is widely recognized that agricultural innovation is important in itself and in its support for other pathways, other pathways also contribute to the development of the rural sector (de Janvry and Sadoulet, 2001; Berdegue and Escobar, 2003; FAO, 2003a).

**Figure 1**  
**Agricultural Knowledge and Information System for Rural Development**

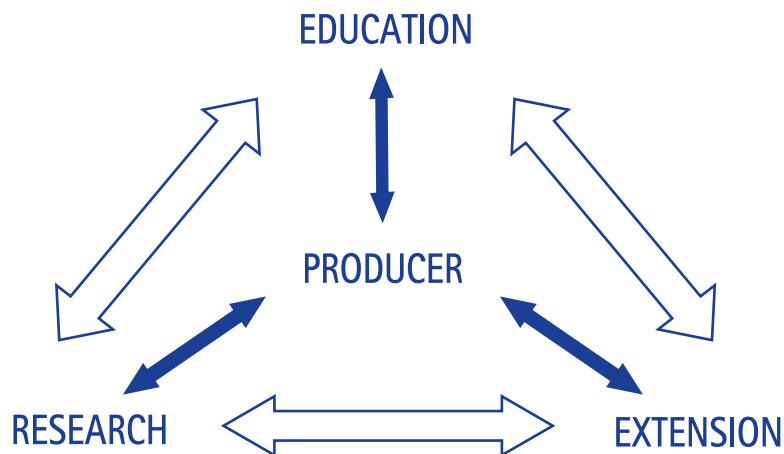
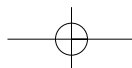
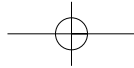


Figure 1 was originally intended to suggest that agricultural information systems for rural development link institutions with people (the end-users of knowledge and information, who are agricultural producers) to promote learning. *AKIS/RD: Strategic vision and guiding principles* (FAO/World Bank, 2000) proposes generating, sharing and utilizing agriculture-related technology, knowledge and information in a strategically aligned system. Such a system integrates farmers, agricultural educators, researchers and extensionists to harness knowledge and information from various sources for better farming and improved livelihoods, as well as regional and national stability and growth. This integration is needed now more than ever, as countries confront the

<sup>4</sup> Note that the figure has been slightly adapted from the original, by replacing the original term “farmers” with “producers”.

<sup>5</sup> Agriculture includes, for example, farmers, monocroppers and mixed-croppers, animal breeders, foresters and fishers; so the term “agricultural producers” seems more inclusive and appropriate.



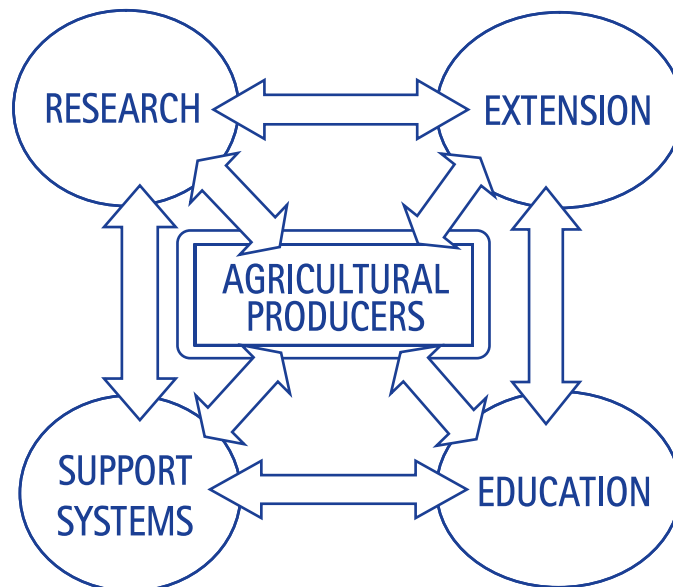


challenges of competing in a globalized economy and building competitive advantages aimed at global agricultural market opportunities.

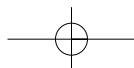
### ***AKIS/RD development***

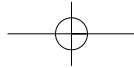
Other ideal models of AKIS/RD that have been put forward are more inclusive of the contextual and environmental systems involved. One such model, which was used by the consultant for the Pakistan case study, illustrates four major subsystems and their idealized information flows: 1) the knowledge creation subsystem; 2) the knowledge diffusion subsystem; 3) the knowledge utilization subsystem; and 4) the agricultural support subsystem involved in credit, input and market functions. Given the inclusiveness of the AKIS/RD vision, if both public and private entities are assumed to operate within the four subsystems, the Pakistan model (adapted to place agricultural producers at its centre) offers a more comprehensive model that includes agricultural support systems, such as credit institutions, supplies and markets (Figure 2).

***Figure 2***  
***An idealized AKIS/RD model***



The Pakistan model might be further shaped to include relevant non-system components, such as government policy, institutional commitment, communication systems other than those assisting extension, and other relevant physical and human resources, as shown in Figure 3. This model, which illustrates the various components surrounding and influencing an AKIS/RD, is a more comprehensive rendering of the idealized AKIS/RD model, bringing together the various main actors with an impact on AKIS/RD and the specific subsystems that comprise the system. Although the addition of these components (policy, physical and human resources, communications, and institutional commitment) may render the model slightly messy, Figure 3 nonetheless suggests the numerous elements in AKIS/RD. In fact, it could be made messier in that the policy, physical and human resources, communications and institutional elements should be connected to each of the



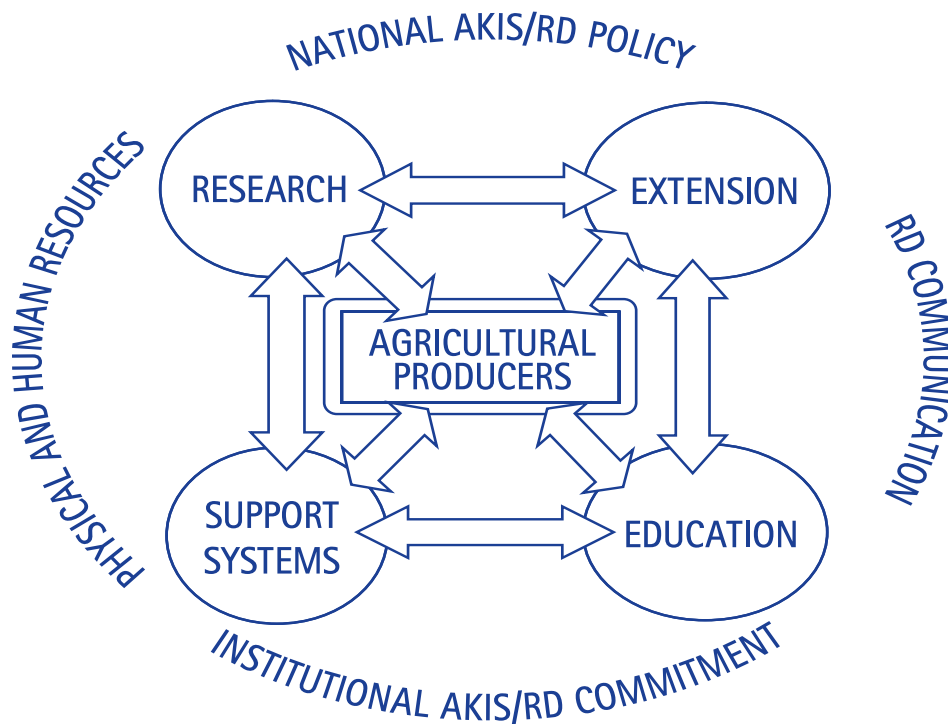


four main sets of institutions – research, extension, education and support systems – which themselves should include both public and private sector entities. In reality Figure 3, would more likely look like a web of crisscrossing connections.

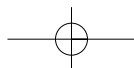
### Rural development

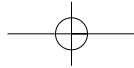
Rural development includes, but is broader than, agriculture and its development. Indeed, non-agricultural activities such as micro-enterprise development are priorities within the rural development strategies of international agencies, such as the Inter-American Development Bank (Echeverría, 1998). However, agriculture remains central to rural development. Most rural populations are engaged in some form of agricultural development, and although agricultural pursuits may not comprise the majority of all endeavours undertaken by rural people, they represent a plurality among the income-generating activities pursued by rural populations.

**Figure 3**  
**A comprehensive AKIS/RD model**



International publications suggest that productivity gains in agriculture are essential for reducing poverty (World Bank, 2002). Agriculture is the main source of income for large numbers of people, and provides the basic food subsistence needs for the majority of the population in these countries, as well as being a main source of income for governments that export food and fibre products (FAO, 1990). In the Malaysia case study, as with other upper middle-income developing countries, the agriculture sector is currently regarded as a strategic sector. For many low-income countries, agriculture is – and will remain for the foreseeable





future – the main sector producing exportable goods. Agriculture will also remain crucial for trade in many middle- and high-income countries (Brown, 1994). Some two-thirds of the people in sub-Saharan Africa depend on agriculture for their livelihoods (Eicher, 2004).

In order to advance agricultural development, governments – with the assistance of international organizations – are beginning to promote decentralized programmes, including subsidiarity approaches that provide communities and rural producer organizations with the potential to develop their own programmes for local development (Mercoiret *et al.*, 2001). The World Bank promotes projects that empower rural people via community-driven development (CDD),<sup>6</sup> which encourages communities to move towards self-determination. These CDD projects assist communities to formulate proposals that are then reviewed and, if accepted, funded.

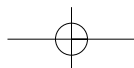
**Figure 4**  
**The multifaceted advantages of producer and community organization**

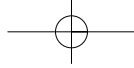


Source: Chipeta (forthcoming)

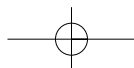
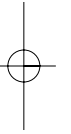
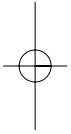
In Denmark, experience confirms that small-scale producers can gain tremendously from organizing and working together to identify their needs and consolidate their demands. Producer organizations that are owned and controlled by the producers themselves have the potential to empower farmers and facilitate the delivery of services that respond to their needs and fulfil the required standards of quality. Figure 4 shows a sample of the multifaceted advantages that producer organizations and community institutions can offer their members.

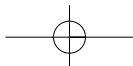
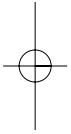
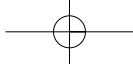
<sup>6</sup> CDD is a World Bank initiative to decentralize the financing of rural development.

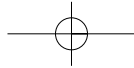




In some cases, governments have initiated efforts to establish nationally integrated and multisectoral extension networks to combat food insecurity. These incipient national system networks include public and private for-profit and not-for-profit organizations, as well as international projects aimed at food security goals. Some governments have created partnerships with other sectors of society, including multisectoral providers of extension and information services, in order to foster the conditions to end hunger. These governments expect a food security strategy to increase domestic food security and, eventually, to facilitate inter- and intraregional trade in food items. They understand that, when organized, poor farmers (i.e. agricultural producers who are underprivileged) can produce beyond their own needs and enter the export market.







## 2. BACKGROUND AND OVERVIEW OF THE AKIS/RD CASE STUDIES

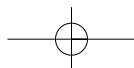
### BACKGROUND TO THE CASE STUDIES

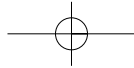
AKIS/RD is a relatively new concept that goes beyond the notion of merely linking public sector agricultural institutions. Linkage between public sector agricultural research and extension has been an important concern since the 1970s. Back then, some scholars went further by starting to argue for the importance of "the integration of research and education with governance, with supply, with production, and with marketing" (Axinn and Thorat, 1972).

National policy-makers and donor organizations soon identified weak links between extension and research as a major factor limiting technological change, and sought to improve these links through policy changes and institutional reorganizations (Crawford, 1982; World Bank, 1985). By the end of the 1980s, the International Service for National Agricultural Research (ISNAR) had produced numerous studies on linking on-farm research and extension (e.g. Merrill-Sands and Kaimowitz, 1980; Ewell, 1989; Merrill-Sands and MacAlister, 1989; Kaimowitz et al., 1989). Other attempts to link research with extension over the last four decades include putting both under the same directorate, creating small extension sections in research institutes, and creating research-extension committees. Efforts to promote AKIS were already being popularized in the 1980s (Röling, 1986; 1988; Blum, Röling and Engel, 1990), and were being put into practice by the late 1980s (Van Beek, 1990). The linkages issue has been widely addressed (e.g. Axinn and Thorat, 1972; Nagel, 1979; Cummings, 1981; Compton, 1984; Kaimowitz, 1990; Pray and Echeverría, 1990; Wheeler, 1990; Epanou, 1993; and Crowder and Anderson, 1997).

The AKIS/RD concept can be illustrated by the United States' Land Grant System. In 1862, the United States Federal Government granted land to the existing states so that they could establish higher education opportunities for the study of agricultural and mechanical arts. Agricultural research and extension were integrated into the Land Grant framework in 1887 and 1914, respectively. The resultant system had built-in linkage, partly because all three functions existed within one institution. The extension component was called the "Cooperative Extension System" because of its system of overlapping authority and shared financial responsibility among federal, state and local governments.

Concern for agricultural linkages is well documented. What distinguishes AKIS/RD is its range of institutional inclusiveness and its expectations, which reach beyond earlier notions of linkages. Indeed, AKIS/RD embraces all those who are concerned with agricultural knowledge and information systems: institutions, organizations, providers and users. It especially emphasizes the





importance of agricultural producers as participants in the AKIS process as the recipients, as well as the originators, of knowledge and information for the purposes of agricultural development. Previously, stakeholder or producer participation was discussed mainly in terms of one or two organizations, usually research or extension (Biggs, 1989; Byerlee and Alex, 1998). AKIS/RD presumes joint planning among AKIS agencies and organizations and is broadly concerned with fostering practical knowledge in an agriculturally organized rural learning society, with a view to developing a rural knowledge society.

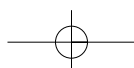
The FAO/World Bank *Strategic vision and guiding principles* (2000) came at a time of major worldwide agricultural change and reform. To a large extent, the role of government has been redefined. There has been a shift towards greater privatization of research and extension delivery. Administrative and fiscal decentralization, while not a panacea, can work for the purposes of agricultural and rural development when undertaken deliberately, consistently and carefully (Binswanger, 1998). The importance of stakeholder participation in decision-making is being promoted, although simply "consulting the poor is not enough to empower them for their own development" (Binswanger, 1998). A number of new funding mechanisms have become prominent, such as contracting for service delivery, competitive grants to institutions, and community project funding.

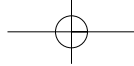
Various specialists have touched on the basic elements of AKIS/RD; for example Bunting (1986) in discussing agricultural extension states that the agricultural knowledge system has five essential components: 1) the existing stock of knowledge (i.e. memory); 2) the means of increasing knowledge (e.g. experience, surveys, research); 3) the means of testing and developing knowledge (R&D); 4) the practical application of knowledge (to increase output, lessen the costs of production and adjust the production system); and 5) the dissemination of knowledge (education, training and extension). Early efforts to advocate and popularize the AKIS concept (Nagel, 1979; Röling, 1986; 1988; Blum, Röling and Engel, 1990) set the stage for the present development of AKIS/RD.

AKIS/RD is distinct from other contemporary linkage concepts. For example, National Agricultural Research Systems (NARS) are essentially loose conglomerates of agencies or actors involved in conducting national agricultural research. According to Chema, Gilbert and Roseboom (2003), "the idea of a pluralistic NARS is only gradually being accepted by the key players in agricultural research".

Another concept quite similar to AKIS/RD is that of National Systems for Innovation (NSIs). These differ in being national rather than rural, and are sometimes limited to promoting systems that foster research innovations (Lundvall, 1992; Edquist, 1997). Chema, Gilbert and Roseboom (2003) note that OECD was an early proponent of this concept, although OECD is also committed to the notion of Agricultural Knowledge Systems (AKS), on which (as already mentioned) it convened two major conferences. FAO and the World Bank explicitly added the term "information" to the AKS concept, stating that knowledge is generated and information transferred; only after it has been transferred can information be transformed into beneficial innovation.

NSI, AKIS and NARS are rooted in systems theory and analysis. Chema, Gilbert and Roseboom (2003) also note that any system is usually part of a larger system and consists of interlinked subsystems. They note that systems analysis emphasizes four dimensions for a system: 1) system





elements and structure; 2) system environment; 3) system linkages; and 4) system performance. To improve the last of these (performance), either the performance of the system components or the internal and external system linkages must be improved. AKIS and NSI tend to focus on the latter of these two options.

Meanwhile, information and communications technology (ICT) specialists stress the applications of ICTs and their contribution to agricultural and rural development in terms of Agricultural Information Systems (AIS), which underscores AIS as a main characteristic of a knowledge society. One ICT paper states that research results have to feed into "Agricultural and Rural Knowledge and Information Systems" (ARKIS). ARKIS are composed of networks of researchers, extensionists, development practitioners and farmers, and aim to generate technological and social innovation on the basis of interactive learning and knowledge development processes.<sup>7</sup> Although distinct, these various nomenclatures tend towards the same result, the development of a more productive and interconnected knowledge society.

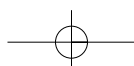
A number of professionals support the advancement of AKIS/RD. One international agriculturist argues that the three pillars of this system – research, extension and agricultural higher education – can be viewed as the "agricultural knowledge triangle" (AKT), and stresses that because the three pillars involve complementary investments, they should be planned and sequenced as a system rather than as separate entities (Eicher, 2001). He notes that linking the triangle's institutions with their mutual clientele, including farmers as well as each other, requires systematic planning. Other specialists (FAO, 2002b; Maguire, 2000) suggest that the concept and practice of agricultural education in developing countries be redesigned as education for rural development and food security. Indeed, many needs are rapidly emerging on agriculture's agenda, such as trade-related education on agro-health (plant and animal health and food safety), value-added agroprocessing, and agromarket competitiveness.

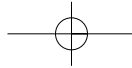
Meanwhile, the realities of shrinking budgets and increasing complexities within agricultural systems also drive different disciplines (marketing, production technologies, natural resources) and various subsystems (research, extension, etc.) towards greater cooperation. In 2001, the World Bank's AKIS thematic group merged with other interest groups within the Bank (livestock, fisheries, crops, gender and biotech interests), and in 2002 changed its name to Sustainable Agricultural Production and Knowledge Systems (SASKI). This realigned thematic group continues its aim, "to establish a community of practice in sustainable agricultural production and knowledge systems to identify, develop and share good practice, paying particular attention to poverty reduction and gender dimensions".

At the same time, old "hard" linear systems are being balanced with new "soft" system thinking. Systems analysis has its origin in the "hard" sciences, and is therefore relatively familiar. A soft system, on the other hand, "is a social construct that does not physically exist but is nevertheless the more relevant concept when studying social phenomena such as research, knowledge or innovation systems". Indeed, agricultural innovation is a socially constructed process (Berdegue and Escobar, 2001). AKIS/RD is a social construct and its successful development will require soft

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<sup>7</sup> See Web site: [www.panasia.org.sg/nird/clic/ict.html](http://www.panasia.org.sg/nird/clic/ict.html).





system thinking. Chema, Gilbert and Roseboom (2003) illustrate the difference between hard and soft systems as shown in Table 1.

**Table 1 - Hard versus soft systems**

	<b>Hard systems</b>	<b>Soft systems</b>
System objectives	Predefined	Variable, according to the purpose of the system
System elements	Fixed	Variable, according to the purpose of the system
System environment	Not relevant	Relevant and, owing to focus, arbitrary
System boundaries	Fixed	Variable, according to the purpose of the system
System relations	Fixed linkage mechanisms	Chaotic variable interaction
System performance	Fixed through input–output relations	Determined by structure and objectives

*Source:* Hartwich and Meijerink, 1999.

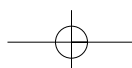
A soft system concept is clearly important in discussions of AKIS, as it can be used to describe a loose conglomerate of different agencies that perform a similar task or work towards a common goal. Chema, Gilbert and Roseboom (2003) state: "Such a system is not a real entity, although we talk about it as though it really does exist (e.g., the education system, the legal system, and the financial system)" – and also AKIS/RD.

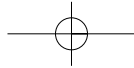
Thus, a number of distinct but related concepts and terms are observed surrounding the system referred to as AKIS/RD. The present study adopts and adheres to the terminology laid down in the FAO/World Bank (2000) document, and AKIS/RD draws specifically on its strategic vision and guiding principles for AKIS/RD. In this study, AKIS/RD is considered as the larger, and therefore more inclusive, system concept. Concerned with more than research and innovation, it covers the entire gamut of agricultural agencies, organizations, stakeholders, processes and goals, while emphasizing the role of the public sector in promoting the public good.

## OVERVIEW OF THE CASE STUDIES

Today, change progresses at a gallop. The industrialization of agriculture, the systematization of the agricultural production system and the food chain, advances in information technology, the role of government services and, in particular, best practices for promoting development are all in the process of change. These socio-economic, political and technical changes inevitably have an impact on agricultural research, education and extension institutions, and bring pressure on them to change.

Agriculture and agricultural production are undergoing rapid transformation. In many countries, farms are declining in number but increasing in size. More heterogeneous farming populations have developed, with homogeneous farming populations rapidly becoming specialized into a mix of distinct agricultural producer categories. The extension services that these producers desire need to be tailor-made, and require a more pluralistic system of research and advisory services. In many developing countries, education and training, physical and institutional infrastructure and modern technology are inadequate to meet the challenge.





The concept and practice of development have also been radically altered over the past two decades, incorporating swings towards varying degrees of privatization and pluralism and, more recently, towards participatory approaches that involve the various stakeholders in the process of agricultural development, e.g. farmers, fish harvesters, foresters and livestock breeders, as well as the organizers and providers of supplies, credit and markets, and the institutional officials and non-governmental participants. These privatizing and participatory approaches to development suggest a new period of interdependency and integration and stress the need for public and private sector cooperation and the development of "mixed economies" (Kammerman and Kahn, 1994).

Governments are also in the process of changing. The end of the Cold War, the mounting debt crisis, the pressures for structural adjustment and reform, and the recognition of global environmental deterioration – these are some of the factors that have contributed to changes in government policies and structures. Most developing countries have now joined the World Trade Organization (WTO), which places renewed pressure on them to compete in the world market. At the same time, in many countries the public sector is faced with limited financial resources, skilled workforce and organizational capacity.

An information technology revolution is unfolding, with tremendous but still largely unrealized potential for rural development (Zijp, 1991). According to one World Bank official (Antholt, 1994), information is as important a production factor as the "classic" land, labour and capital. This is the context in which FAO and the World Bank published their *Strategic vision and guiding principles* (2000).

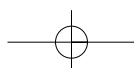
The demanding task of promoting AKIS/RD is evident in the ten country case studies analysed in this study. They reveal that a number of actions and conditions are necessary to develop an integrated and effective AKIS/RD, including but not limited to the nine principles identified in the seminal FAO/World Bank document.

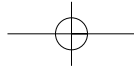
## **DIFFERENT STAGES OF AKIS/RD DEVELOPMENT**

The ten countries reviewed in this study do not yet appear to possess totally integrated and operative AKIS/RD, although all of them appear to want to move in that direction and most appear to be making significant progress.<sup>8</sup> Agricultural research, education and extension still tend to operate as three separate systems (or subsystems), and there are varying degrees of linkage within the three public sector institutions, occasional connections with the private sector and increasing participation from agricultural producers in the individual systems. The specific (sub)systems of agricultural research, education and extension may be performing well, but lack the degree of coordination that would distinguish them as an integrated system. A few countries appear to be leading the way toward AKIS/RD development, while others are just on the road or at the threshold of AKIS/RD, at the stage of planning to encourage cooperation among institutions and sectors with the participatory involvement of agricultural producers.

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<sup>8</sup> Throughout this study, the term "AKIS/RD" is used to refer to the organizations and institutions from which rural people obtain access to the knowledge and information needed to drive innovation and development.



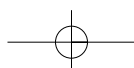


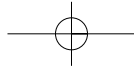
The country case studies tend to be highly situation-specific, although a number of commonalities in terms of strengths and weaknesses emerge. Countries that might be categorized as on the road or at the threshold appear to have initiated a number of measures aimed at developing AKIS/RD. However, these countries still tend to need to improve: a) the performance of their agricultural research, education and extension subsystems; b) the interaction between these and the private sector; and – especially – c) connections with end-users through participatory system approaches. In some cases, such as Cameroon and Uganda (both of which have entirely adopted the philosophy and principles of AKIS/RD), the development appears to be highly dependent on donor assistance, mainly from the World Bank and FAO, but also from international NGOs.

Of the ten countries studied, those that appear to be most advanced in terms of developing AKIS/RD have formulated policy arrangements and operative mechanisms to ensure joint planning and implementation of their country's AKIS linkages and programmes. The three (sub)systems and their connections with the private sector and agricultural producers appear strong, and the goals of the AKIS/RD are well understood by all stakeholders – which is a highly important factor. The countries in this category appear to be leading the way to strategically aligned, coordinated operations in which all stakeholders act together in concert in the AKIS/RD process.

Ideally, the AKIS/RD vision aims to streamline the generation and exchange of agricultural knowledge and information within and between the public and private sectors so as to promote jointly planned, practical actions that help agricultural producers improve their productivity, access to markets and quality of life, as well as contributing to increased national production. In order to integrate and streamline AKIS/RD, certain characteristics appear to be necessary, if not sufficient, for countries seeking to develop an AKIS/RD. These include:

- a policy environment in which country policies and strategies have direct and indirect impacts on the development and implementation of the AKIS/RD, emphasize targeting the public good, and pay attention to the economic efficiency of the agriculture sector and its impact on rural development;
- institutional developments including the existence of AKIS oversight and development units, central and branch supervision, initiatives to build AKIS institutional resources (especially human resource development programmes for leadership and staff), sound strategy for programme decentralization (particularly subsidiarity to the community and producer organization levels), improved agency performance, and the installation of M&E and impact assessment systems for analysing AKIS/RD programmes;
- the conditions for stimulating the expression of demand for innovation, including a demand-driven orientation in public AKIS/RD programmes, public sector investment in market supports, public sector support for input supply (especially agricultural credit and supplies), physical infrastructure support in rural areas, joint planning among AKIS/RD institutions and the private sector, and gender inclusion in all institutional planning and linkage programmes;
- the advancement of partnerships and networking among the AKIS/RD institutions to enhance effective cooperation, strong public-private partnerships and the





promotion of institutional pluralism, programme participation by agricultural producers and their organizations, and the effective use of both traditional and modern communication technologies;

- the presence of financing systems for innovation, including adequate public sector funding for AKIS/RD, the institutionalization of repartition of costs for services (through fee-based or other cost-sharing methods), and investment to develop stakeholder capacities through training, updating and other avenues of agricultural knowledge and information exchange.

These characteristics form the basis for examining the ten case studies, and are categorized into five priority areas: 1) policy environment; 2) institutional structure for the support of innovation; 2) conditions for expressing demand for innovation; 4) partnership and networks; and 5) financing systems for innovation. A total of 24 indicators are organized under these five priority areas, and findings from the ten country case studies are then ranked against these 24 indicators<sup>9</sup> (which include the nine basic principles as well as 15 additional ones for advancing AKIS/RD: see Table 2).

Each country is ranked with asterisks, as follows: one asterisk indicates weak commitment; two asterisks show moderate commitment or some action at the time of the case study; and three denote extensive or well-developed action at the time of the case study. Empty spaces indicate that at the time of the case study either no action had been taken or no information was available.

*Note:* the case studies were undertaken between 2001 and 2003 and the present study was completed in mid-2004; therefore certain information may now be outdated.

The ranking is intended to be indicative, not absolute. The rankings are generalizations, and meant to be helpful in providing an impression of each country's stage of AKIS/RD development. Indeed, some of the indicators are broad, and the textual reference may be based on only one area of development; for example, the concept and practice of decentralization covers a wide variety of possibilities including decentralization, devolution, delegation and subsidiarity. In this case, a higher ranking is given to countries that have arrived at decentralizing to the local level, or that are progressing towards "subsidiarity".

In summary, the ranking by indicators for each individual country in the table is meant to provide a general overview of the country's status regarding the five main criteria selected as indicative of AKIS/RD development at the time the case study was written. (See References for the case studies' dates of completion.) In addition, although this study makes a tentative effort to differentiate countries according to whether they appeared to be "leading the way," "on the road" or "at the threshold" of AKIS/RD development, the stages of AKIS/RD development in the ten countries are too blurred to make sharp distinctions.

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<sup>9</sup> This number of indicators is somewhat arbitrary and could be expanded or disaggregated further.

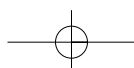
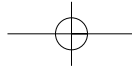


Table 2 - AKIS/RD criteria: ranking

AKIS/RD	Cameroon	Chile	Cuba	Egypt	Lithuania	Malaysia	Morocco	Pakistan	Trinidad and Tobago	Uganda
<b>1. Policy environment</b>										
1.a Existence of national AKIS/RD policy, plan, formal agreement	xxx	xxx	xxx	x	xxx	xxx	xxx	xxx	x	xxx
1.b AKIS/RD targets public goods	xxx	xxx	xxx	xxx	xxx	x				x
1.c Attention to economic efficiency of agriculture sector	xx	xxx	x		xx	xx	x			x
<b>2. Institutional structure for support of innovation</b>										
2.a Existence of AKIS/RD units	xx	xxx	xxx	xxx	xx	xxx	xx	x		xxx
2.b Central and branch supervision	xxx	x	x		xxx	xxx	xx	x	x	x
2.c Initiatives to build institutional (HRD) resources	xx		xxx		x	xxx	xx	x	xx	xxx
2.d Sound strategy for programme decentralization/subsidiarity	xx	xxx	xx		xx	x	xx	x	x	xxx
2.e M&E and impact assessment	xxx				xx	xx	x	x		
2.f Functional performance of AKIS entities	xx	xx	x	x	xx	xx				
<b>3. Conditions for expressing demand for innovation</b>										
3.a Demand-driven orientation	x	xxx	x		xx		xx			xxx
3.b Agricultural market support		xx			xx	xxx			x	xx
3.c Input (credit, supplies) support	xx	x			x	x				
3.d Physical infrastructure support	x	xx	xxx	xxx	xx	xx	xxx			xx
3.e Joint planning/effective linkages	x	x	xx	x	x	x	x			x
3.f Education (HRD) for APs	x	x	xx	x	x	x	x	x		xx
3.g Gender inclusion	xx		x	x	x	x	x			
<b>4. Partnerships and networks</b>										
4.a Structures for effective institutional cooperation	xx	xx	xx	x	x	xx	x	x		xx

AKIS/RD	Cameroon	Chile	Cuba	Egypt	Lithuania	Malaysia	Morocco	Pakistan	Trinidad and Tobago	Uganda
4.b Existence of strong public-private partnerships (pluralism)	xx	xxx			x	xxx	x		x	xx
4.c Programme participation by APs (and their RPOs)	x	xxx	Xx		xxx	x	xx			xx
4.d Effective use of traditional communication technology	X					x			x	X
4.e Effective use of modern computer/internet technology		xx	Xx	xx	xx	xx				X
<b>5. Financing systems for innovation</b>										
5.a Adequate funding for AKIS/RD	xx	xxx	Xx	x		xxx				X
5.b Repartition of costs	x	xxx			xx	xx	x			xx
5.c Investments to develop stakeholder capacities (RPOs)	X	xx	xxx		xx	x	xx			xx

AP = agricultural producer; RPO = rural producer organization; HRD = human resource development.  
 \* = weak commitment or no action at time of case study; \*\* = moderate commitment or some action at time of case study; \*\*\* = extensive or well-developed action at time of case study.



Overall, the ten countries are rated as to their practical (i.e. their *actual*, not proposed or expected) connections among the three component (sub)systems of agricultural research, education and extension, between those (sub)systems and the private sector, and with agricultural producers – especially in terms of producers' participatory involvement in programme decision-making. Of critical importance over the long term are human resource development and management by the leaders and staff of AKIS/RD institutions; the enabling of the private sector and, in some cases, assistance with the development of its human resources; and the involvement of agricultural producers and stakeholders in the AKIS/RD process. In the final analysis, a successful and sustainable AKIS/RD will depend on financing, particularly public sector investments that promote the functional performance of the AKIS (sub)systems, but also investments that enable the private sector and stakeholders to advance their interests within the system.

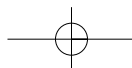
In conclusion, it appears that some countries are "at the threshold" of developing an effective, integrated AKIS/RD, meaning that their three component (sub)systems function relatively autonomously and independently with few linkages among them or between them and the private sector, including agricultural producers. At best they are adapting in that they have begun to plan for increased interaction and cooperation within the context of AKIS/RD.

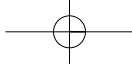
Other countries are considered to be "on the road" towards AKIS/RD, because their three component (sub)systems are relatively interactive and at least partially involved in joint operations at the administrative and field levels. They are adjusting to the practicalities of developing AKIS/RD in that they are already partially cooperating among themselves and beginning to seek private sector involvement, as well as encouraging the participation of agricultural producers in decision-making processes.

Finally, some countries are seen to be "leading the way", meaning that the three component (sub)systems are relatively integrated and their operations are reasonably coordinated. In short, their AKIS/RD are aligned and all stakeholders are generally acting together in concert.

Based on analyses by the national consultants, some countries – Cameroon, Chile, Cuba, Lithuania, Malaysia and Uganda – stand out because they have either significantly evolved an AKIS/RD or are rapidly moving in that direction. In both Chile and Cuba there is no specific AKIS/RD policy, although their agricultural knowledge and information (sub)systems are being, or have been, integrated. Chile recently underwent a major transformation when the government decided not to support extension arrangements with the private sector, feeling that agricultural producers have arrived at a point where they can fend for themselves. The Chile case study was written before this decision was made, however. Thus, countries appear to move ahead in fits and starts in the development of effective AKIS/RD. Political developments also influence AKIS/RD. Cuba, for example, is a special case, having moved from a strictly hierarchical AKIS to one that is demand-driven and strongly participatory.

Cameroon, Morocco and Uganda are evolving rapidly towards integrated AKIS/RD. They are reaching out to establish greater partnership and better networking in order to integrate their agricultural knowledge and information systems. However, these three countries are still confronting distinct gaps in development, and all appear to have systems that lack adequate decentralization, participation and subsidiarity.

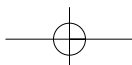
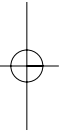
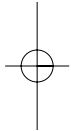


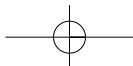
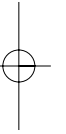
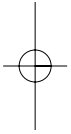
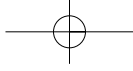


Egypt, Pakistan, and Trinidad and Tobago are gradually evolving and might be categorized as being "at the threshold" of AKIS/RD. The Egypt and Pakistan national consultants are hopeful that their countries will soon be "on the road" to developing integrated AKIS/RD. Although still hierarchical and top-down, Egypt and Pakistan both appear to be advancing gradually towards this category, with several innovations taking place, including greater decentralization to provinces and districts within the government system. Trinidad and Tobago is difficult to judge as the data in the case study are from 1988, and at best reflect a highly traditional system.

In sum, Cameroon, Chile, Cuba, Lithuania and Malaysia appear to be actively moving towards an AKIS/RD. Morocco and Uganda have adopted the basic AKIS/RD vision and are working towards implementation of its principles. Egypt has adopted the vision but has not yet taken the necessary steps towards realizing an effective AKIS/RD. Pakistan has yet to embrace the AKIS/RD vision and principles in practical terms. The Trinidad and Tobago case study suggests that this country of two islands will have to take determined action before it begins to move towards an effective, integrated AKIS/RD.

Again, these divisions are meant to be suggestive and helpful in reviewing the commonalities and differences among the ten countries in the case study project. If this preliminary categorization serves to foster discussion about the status of the countries involved, and if it leads to increased acknowledgement of the value of AKIS/RD, then the objective of the categorization will have been accomplished.





# 3. STRENGTHS, WEAKNESSES AND INNOVATIONS RELEVANT TO AKIS/RD IN THE CASE STUDIES

All ten countries studied have well established, functioning public sector agricultural research, education and extension systems. However, this fact does not tell how effectively or efficiently the systems are performing, or the extent to which different systems are being integrated as (sub)systems in the larger context of an integrated AKIS/RD. It does not elucidate how successfully these systems provide agricultural producers and other clients with the means to improve production and build competitive advantage.

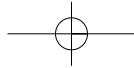
The following overview of strengths and weaknesses in the ten country case studies is based on the national consultants' findings. The strengths and weaknesses are evaluated in keeping with the 24 indicators that fall under the five main priority areas established in Section 2.

## **POLICY ENVIRONMENT**

The national policy environment, which is largely set by government, provides the "space" in which the AKIS/RD evolves. A sound policy environment requires clear public policy in support of AKIS/RD programmes, public investment that is focused on the production of public goods, and attention to maximizing the economic returns on investments in knowledge and information services and in the rural sector in general. Three main challenges for policy determination are: 1) greater devolution of power and the empowerment of local people and their organizations; 2) creation of decentralized institutional structures that facilitate the implementation of core policies; and 3) investment in education and training to support income diversification and gender goals.

### **National strategy and plan for AKIS/RD development and operations**

*A formulated AKIS/RD policy is important, but with it must come commitment to the AKIS/RD vision and principles.* All ten countries covered by the study have some sort of AKIS-related national policy or plan, but not all have developed a strategy for its implementation. Seven of the ten country case studies make reference (see Table 2) to a policy mandate or national plan for agricultural development, and refer to a national strategy or multiple nationwide programmes for the advancement of components central to the vision and principles put forward by FAO/World Bank (2000) to promote AKIS/RD. Lithuania's policy orientation is dispersed – each ministry follows its own lead – but several new laws and plans promise a strong framework for rural development and



AKIS/RD-related policy. Egypt, Pakistan, and Trinidad and Tobago, although they have national plans, still lack effective, efficient implementation of their mandate. For example, institutions in Trinidad and Tobago remain quite centralized, despite the country's 1988 to 1990 policy for decentralization.

Chile, for example, does not appear to have an explicit AKIS/RD policy, but demonstrates a strong commitment to rural development that fosters AKIS/RD among its agricultural research, education and extension institutions, and a close partnership with the private sector. Its commitment to rural development is evident in a steady increase in its national and sectoral public allocation for productive growth and the development of social and physical infrastructure. Cuba's Strategy Plan for Agricultural Extension (1998) envisions networks of research, extension, education and producers, puts emphasis on networking through mass media extension activities, and is devoted to developing an Agricultural Science and Technology Innovation System. In this case, national strategic planning appears to be an even more important strength than formal policy formulation.

Sector leadership is critical. Of note from the Malaysia case study is that in 1999 a new Minister of Agriculture with wide experience in the corporate sector was appointed to the Cabinet. Under his leadership, the Ministry of Agriculture's policies changed for the better in terms of promoting agriculture as a vibrant sector worthy of larger investments and recognizing its potential to contribute to the economy. A new dynamism was injected into the ministry's agencies, and revived concern was sparked for designing commercial projects, producing commodities on a large scale, planning implementation, and monitoring results and progress.

### **Targeting the public good**

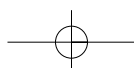
#### ***Targeting the public good is a promise embraced by the World Food Summit, whose goal is to reduce food insecurity by half by 2015.***

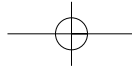
When AKIS target public good issues, they support the World Food Conference of 1974, the World Food Summit of 1986 and its follow-up conferences, and the Millennium Development Goals.<sup>10</sup> Although the majority of the world's population will be living in urban areas by 2030, farming populations will not be much smaller than they are today. For the foreseeable future, dealing with poverty and hunger in much of the world means confronting the problems that small farmers and their families face in their daily struggle for survival (FAO/World Bank, 2001).

Malaysia's Third National Agricultural Policy (for 1998 to 2010) has the primary aim of transforming agriculture into a modern, dynamic and competitive sector. It laid the foundation for viewing agriculture in terms of its potential contribution to gross domestic product (GDP) and adjustment of the trade imbalance, increased private sector participation, improved producer income, and enhanced innovation and technology capacity. By mid-2000, a new model for the agriculture industry in Malaysia had emerged, which focuses on producing high-quality agriculture and food products that are market- and technology-driven. While Malaysia's AKIS institutions are not necessarily innovative with regard to all the AKIS/RD principles, they appear to function effectively, albeit they are dedicated

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<sup>10</sup> The eight millennium goals are: 1) eradicate extreme poverty and hunger; 2) achieve universal primary education; 3) promote gender equality and empower women; 4) reduce child mortality; 5) improve maternal health; 6) combat HIV/AIDS, malaria and other diseases; 7) ensure environmental sustainability; and 8) develop a global partnership for development.





primarily to commercial production. It could be questioned whether such a strategy is optimal for addressing the needs of the rural poor and the degradation of the environment.

Rural poverty is widespread in Lithuania. In 1999, the rural poor constituted 28 percent of the rural population (the equivalent figure in the cities was 7 percent, with an overall national average of 16 percent). There are more children in rural areas than in the cities, which means that the situation will not improve in the near future; in fact, poverty may affect a growing number of rural residents. The result is a kind of a viscous circle: poverty is widespread because of low investment in human resources, and investment is low because of poverty. To break this cycle, according to the national consultant, government must develop and implement long-term agricultural and rural development strategies, including the development of education, research and information systems.

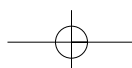
Agriculture figures as one of the priority sectors in the Pakistan Government's agenda for Economic Revival and Poverty Alleviation, even though the labour productivity and per hectare crop yields of Pakistan's agriculture are among the lowest in the world. Government has promoted agriculture and rural development by encouraging its various institutions, organizations and individuals at all levels to undertake programmes and activities in agricultural research, extension and education and farmers' empowerment in order to bring about a technological breakthrough in agriculture and enhance per unit productivity. The ultimate goals of these initiatives are food self-sufficiency (food security), increased agricultural exports, human development, environmental sustainability, improved quality of life for people in rural areas, and the development of alternative strategies for rural poverty alleviation. However, all stakeholders expressed uncertainty about the success of the programmes as foreseen in the 1998 to 2010 Education Policy. The national consultant recommends immediate action to make all the requisite inputs available and to provide quality technical/vocational education and training to agricultural producers, traders, technicians and technologists in areas linked with national development in order to increase productivity per head and reduce rural poverty.

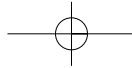
In Uganda, the Plan for Modernization of Agriculture (PMA) incorporates a strategy to eradicate poverty through a multisectoral investment approach. The PMA has identified several intervention areas such as research and technology development, agricultural advisory services, rural finance, agroprocessing, agricultural education, natural resource management, and rural infrastructure. All these are relevant to the development of AKIS/RD. The PMA offers opportunities for better coordination and linkages, farmer empowerment and ownership mechanisms, decentralization, and pluralism in service delivery, all of which are pertinent to the management of AKIS/RD. Well received by donors and other stakeholders, the PMA is thus expected to benefit from a wide support base.

#### **Attention to economic efficiency**

***The original Terms of Reference sent to the case study consultants requested information on the overall impact of and funding for AKIS/RD. These two issues depend largely on the system's economic efficiency.***

At this early stage, as might be expected, economic efficiency was conspicuous by its absence in most of the case studies. This lacuna deserves to be filled by economic study, as AKIS/RD become more of a reality in developing countries. The operative question is whether AKIS agencies and organizations give value for money in terms of the impact of AKIS/RD, i.e. changes in the behaviour and productivity of end-users that are in line with the jointly planned AKIS/RD goals.





Cameroon's National Programme for Agricultural Extension and Research (PNVRA) appears to be generally satisfactory at all levels – institutional, programmatic and human resources. At the institutional level, formal collaboration has been established between research and extension (as a result of the Convention for Agreement between the Ministry of Scientific and Technical Research [MINREST] and the Ministry of Agriculture [MINAGRI] of 30 April 1996).

Chile has successfully employed a two-tiered agricultural institutional strategy (with one set of programmes for emerging agricultural producers and another for those at more basic levels) that emphasizes economic efficiency. This dual strategy seeks to promote a market-oriented rural economy and reduce poverty. Using this strategy, the government emphasized the role of the private sector as the principal motor for development, with government providing a support strategy, including investments in infrastructure, effective services and channels for commercialization, stakeholder empowerment, and security nets for vulnerable groups. In short, it recognized the importance of the private sector for promoting economic growth, and the concomitant need to raise the income levels and quality of life of rural people living below the poverty line. This strategy has resulted in Chile becoming one of Latin America's leading agricultural economies.

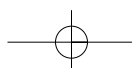
## **INSTITUTIONAL STRUCTURE FOR SUPPORTING INNOVATION**

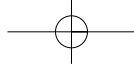
***Various institutional structures will need to support the goals of AKIS/RD. Where they do not already exist, AKIS/RD national oversight units might be established to coordinate, foster collaboration and ensure that the system's impact and efficiency are evaluated as it develops.***

Central- and branch-level supervision of AKIS/RD activities is required in order to monitor the commitment to supporting innovation. Human resource development is central to long-term development, and includes the upgrading of administrative leaders as well as staff. Decentralization – whether deconcentration to central government branch offices, devolution of authority to sub-government levels along with "fiscal federalism", or subsidiarity to community and local organizations – represents a critical factor in bringing about the increased involvement of personnel and stakeholders in the agricultural development process, thereby fostering AKIS/RD. For agricultural knowledge and information to reach end-users, the respective organizations involved must perform their functions effectively and efficiently, and there must be systems for M&E and impact assessment within and across institutions.

### **Existence of public sector AKIS/RD units**

An AKIS/RD unit is an individual or organizational unit charged with proactively promoting the development of public and private sector knowledge and information institutions, and the linkages between them. In many ways, this is equivalent to developing a market for innovation services. In practice, such a unit may seek to improve the impact of an AKIS/RD agency or of the set of public sector AKIS/RD agencies. An AKIS/RD unit should have the authority to promote and enforce the policy mandate, and should be dedicated to creating and facilitating linkages among research, education and extension institutions, as well as with private sector entities, agricultural producers and their organizations. It should be the authority responsible for overseeing the development and results of AKIS/RD, and there should be a unit in each AKIS institution. The unit's purpose is manifold: to review, examine and report on the efforts of AKIS institutional structures; to promote





the conditions for expressing demand for agricultural innovation; to advance partnerships and networks among both public and private AKIS institutions; to oversee joint planning among AKIS institutions; and to assist with sources of financing for AKIS/RD.

### **Results-oriented management**

Central to improving AKIS/RD performance is a move to focus on programme impacts and results for ultimate clients rather than on budgets, inputs and activities. Management systems must define their ultimate goals and work towards these. This requires accountability for performance and results at all levels of the organization, and has especially important implications for the deployment of resources through budgets and personnel management. It will also frequently require partnerships and recognition of the different comparative advantages of other institutions.

Cuba maintains central supervision, but this is moderate now that the country has considerably decentralized its agricultural institutions. Branch supervision is stronger because government is far more concerned with local development. Trinidad and Tobago has not developed AKIS/RD units. Although government and sub-government supervision exists, there is no widespread dissemination of innovations, and no discussion of the constraints or benefits that might be associated with innovation.

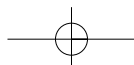
### **Attention to AKIS/RD human capacity building**

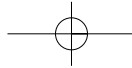
#### ***Staff preparation and development are key to effective AKIS (sub)systems, and therefore AKIS/RD success.***

Somewhat surprising in the case studies was the extent to which the countries studied have undertaken initiatives to build AKIS institutional resources through human resource development. One of the most important aspects of Cuba's AKIS/RD is the attention it pays to this factor through constant updating of staff. In Cameroon's PNVRA, numerous research and extension staff have been trained in methods of adaptive, as well as applied, research station-type agriculture.

In Morocco, training constitutes the most dynamic aspect of the Project to Support Agricultural Development (PSDA), and is directed at all stakeholders in agricultural development (supervising staff, technicians, farmers, rural women and professional organization members). Initial and on-the-job training of staff in charge of agricultural development has led to important qualitative changes in working methods. Special emphasis has been placed on training extension staff in order to update their knowledge level and improve their communication skills with farmers. Eight regional centres of agricultural in-service training have been created and equipped, and provide training for the sons and daughters of farmers, as well as the farmers themselves. In addition to this network of training centres, the National Centre of Extension Studies and Research and the Perfection Centre at Mehdia actively promote national training programmes. Agricultural extension services have also been improved by instituting precise tasks and sustained training for staff and farmers.

In Malaysia, AKIS operators felt that they needed both technology development and a better understanding of social concerns. Trinidad and Tobago suffers numerous AKIS constraints; among which are insufficient human resource development (especially career development and promotion), as well as poor staff deployment, and poor education opportunities.





## **Sound strategy for programme decentralization and subsidiarity**

### ***Decentralization and subsidiarity are important means of integrating agricultural producers into AKIS decision-making processes.***

Several of the ten countries studied have introduced reforms to decentralize AKIS/RD operations to local government units or stakeholder groups. These initiatives tend to involve decentralization at the State level via subsidiarity, participatory approaches, institutional pluralism involving sundry private entities, and a trend towards demand-driven agenda setting.

Uganda's PMA is based on decentralization to the municipal and farmer levels. Future programmes include plans to increase rural literacy and train agricultural and other stakeholders in managing the decentralization process. The idea is for farmers to be supported through municipal governments, with a view to contracting directly with the private sector for delivery of extension services. An important component in this scheme is that it will enable competent private sector extension providers to operate, something that did not happen before.

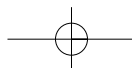
Cuba is a special case in that its previously centrally coordinated AKIS underwent an about-face after the economic shocks of the 1990s. Decision-making authority and implementation control are currently devolved to a range of participants. "In a sense, a decentralized, lightly coordinated extension system has evolved, one focused on increasing AKIS efficiency in support of food security" (Carrasco, Acker and Grieshop, 2003). Since 1990 and the changes to Cuba's policies and practices, food security and the quality of life seem to have improved for Cubans. Deconcentration and decentralization are currently taking place within Cuban society, and this is significantly facilitating interactions among the agencies and people involved in agricultural and rural development programmes. One example is agricultural delegates' (representatives, promoters and extensionists) newly instigated participation in Cuba's Popular Council. Another example is the inter-institutional relations that exist at all levels and help to develop national, provincial, territorial and local policies. Local communities can enter the process and help to confront the challenges emerging from globalization.

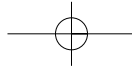
Egypt's AKIS institutions of research, education and extension have been slow to exploit the potential of economic liberalization and decentralization. Research and extension plans have not responded sufficiently to new market opportunities for added value, product diversification and increased input availability. Similarly, the social and economic sciences are still missing from the curricula of many agricultural training establishments. Hence, AKIS/RD institutions have not been sufficiently responsive in addressing the problems and opportunities facing farmers. A lack of systematic collaboration among researchers, educators, extension staff and farmers has limited the effectiveness and relevance of support services to the rural sector.

## **Existence of systems for M&E and impact assessment**

### ***Monitoring informs whether programmes are doing things in the right way; evaluation informs whether programmes are doing the right things.***

M&E is an essential function for AKIS agencies, providing them with feedback to improve their performance and evidence that they are achieving the desired impacts. The fact that this function





is weak in almost all AKIS institutions was confirmed in this study. The methodology and arrangements for undertaking M&E of the overall function of an AKIS/RD are particularly difficult and have not been explored beyond the monitoring of macroeconomic or sectoral indicators.

In Cuba, M&E is carried out by each organization separately, according to individual project activities. In each of Cuba's inter-organizational cases cited, the objectives and their expected outcomes are clearly stated, and each organization involved provides its own expertise to achieve the overall project outcome. Thus, each case is evaluated according to the different elements involved, although there are different ways of measuring success. However, the report is unclear as to who measures the overall success of the different projects. The implication is that end-users ultimately determine whether the projects work or not. Evaluation appears to be an ongoing process in which, if something does not work the first time, modifications are made and new approaches are tried until the desired outcome is achieved.

In Cameroon, M&E systems operate throughout the PNVRA. In Malaysia, the M&E system depends on the Farmer Organization Authority (FOA), which elects a Board of Directors for every district every two years. This board operates as a mechanism to ensure farmer participation in the planning, implementation and monitoring of FOA programmes. In Uganda, although agricultural producers are currently encouraged to participate in most aspects of programme development, so far they have little involvement in M&E.

In Trinidad and Tobago, there is an absence of M&E and impact assessment. The National Marketing Development Company seems to be one of the few institutions that works closely with producers and has developed systems of M&E for its activities. As well as contracting with the private sector to combat the hibiscus mealy bug, marketing extension services appears to be one of the few strengths in the Trinidad and Tobago system.

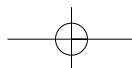
### **Functional performance of AKIS entities**

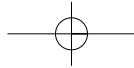
#### ***The effective performance of individual AKIS entities is a necessary step towards the effective functioning of the AKIS/RD.***

Evidence of past success, and research, extension and education institutions with good reputations are indicators of the overall strength of subsystems and the potential for effective linkages. In short, does the AKIS entity have a good reputation, and is it having the required impact?

Lithuania appears to have a uniform and reasonably well-developed network of scientific, educational and consultative institutions. The AKIS institutions operate within the Agricultural Chamber, as do the self-governing farmers' organizations.

In Egypt, despite the lack of state decentralization and subsidiarity to local communities, knowledge generation by the research agencies has led to productivity increases for most crops, an expanded cultivated area in the desert, and the conservation of natural resources through producing new varieties and technologies. Egypt's extension system has also played an important role in disseminating technological packages through printed and audiovisual communications. Farmers use these technological packages, which are produced by the research system and transferred via extension, and generally provide feedback.





The Pakistan Agricultural Research Council (PARC) undertakes, aids, promotes and coordinates agricultural research, organizes high-level training, and acquires, disseminates and promotes the adoption of newly evolved agricultural technologies through its network of research and technology transfer institutes located throughout the country. PARC performs its mandated roles in collaboration with provincial institutions and organizations, in order to avoid duplication. For example, PARC carries out basic and strategic research, while the provincial research institutes deal with applied and adaptive research. The universities, however, are autonomous bodies and perform their educational and research roles independently with very little joint programming and few linkages to PARC and other private sector AKIS/RD operators.

### **CONDITIONS FOR EXPRESSING DEMAND FOR INNOVATION**

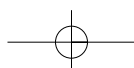
A shift from bureaucratic, top-down, supply-driven programmes to a situation in which producers' needs and market forces set the priorities for knowledge and information services is widely seen as key to improving AKIS/RD performance. In this context, a primary condition for expressing demand for innovation is for the public sector to adopt a demand-driven orientation. In many ways, this equates to empowering producers. Establishing local-level programme advisory committees consisting of local producers and stakeholders is one way to build demand-driven programmes.

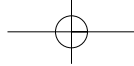
In order for innovations to make financial sense for agricultural producers, the public sector must also support market development and access to credit and other reliable and timely inputs. Agricultural producers often lack adequate roads, transportation facilities, electricity and other physical infrastructure, as well as access to markets, which are often long distances from their farms. They also lack sources of agricultural knowledge and information. Developing physical infrastructure in rural areas can open doors for enterprising producers. In advancing AKIS/RD, one key is to ensure effective linkages, preferably through joint planning among the agencies responsible for research, education and extension. For agricultural producers to operate in a globalized world, governments must be ready and willing to support the development of people in the rural sector, including not only men, but also women; in most developing countries women contribute significantly to production for market, as well as domestic activities. Such development must be targeted to poor and disadvantaged groups, including indigenous peoples who are often living in remote and less favourable production zones that have been by-passed by previous government programmes.

#### **Demand-driven orientation in public programmes**

***Demand-driven programmes respond to the problems, needs and interests of agricultural producers, and involve them in programme governance, priority setting and evaluation, often by working through and strengthening producer organizations.***

Public sector AKIS/RD programmes can adopt a demand-driven orientation by involving producers in setting priorities and in programme governance and evaluation. Participatory planning and implementation help to inject users' views and priorities into programmes. The full empowerment of demand comes when users pay for services under a market system, using either their own resources or funding provided through public programmes. Wealthier farmers have nearly always been able to make their voices heard and gain access to whatever government services have been available.





Uganda shows promise of becoming a demand-driven system in which farmers are empowered and agricultural development programmes and activities are responsive to their needs. In Trinidad and Tobago, four public sector commodity programmes are cited as being demand-driven: new varieties of cocoa, new varieties of sugar cane, farm certification, and hot peppers export. The National Marketing Development Company (NAMDEVCO), a private company that manages municipal and regional wholesale and retail marketing outlets throughout the country, developed these programmes. Most of the fresh fruit and vegetables produced locally by small farmers are marketed through NAMDEVCO.

While Malaysia's system appears to be effective, it may not yet place enough emphasis on targeting the public goods of food security, sustainable agriculture and environmental conservation, and it lacks a demand-driven approach that promotes farmer-relevant and effective processes of knowledge and technology generation, sharing and uptake. Pakistan's public sector programmes are also not demand-driven. The top-down approach appears to dominate in most of its AKIS institutions.

### **Agricultural markets**

#### ***Increasing a farmer's productivity means little if there is no viable market available for the sale of products.***

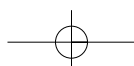
Markets must be available for farmers' products if farmers are to seek and invest in innovations that enhance productivity. Policy and infrastructure condition market operations, while market information services provide direct support to producers seeking to improve their marketing efficiency. Sanitary and phytosanitary regulations, certification of production processes (e.g. organic production, fair trade, geographic origin), and grades and standards are becoming increasingly important ways of gaining access to global markets. These all require significantly higher knowledge and information inputs into production and marketing. Competitive markets with level playing fields for all participants have generally proven to be the most efficient in promoting overall competitiveness in the rural sector.

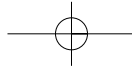
In the Cuban case study, although there is no mention of support for agricultural markets, internally there is a major drive to promote local markets. Uganda is confronted with a number of opportunities. Market-oriented commercial farming is to be promoted in the context of Uganda's National Agricultural Advisory Services (NAADS). However, the agriculture sector, despite its importance, remains constrained by insufficient information, knowledge, improved technologies and market linkages to catalyse increased production and productivity among rural farmers.

### **Input supply systems (credit, supplies)**

#### ***Credit and supply systems are necessities for agricultural producers to invest and develop their products.***

Credit and supplies must be available for producers who wish to adopt innovations. In the past, input supply and credit systems were often run, and constrained, by public sector policies or parastatal operations and subsidies. In many countries, this era is passing, but the evolution of competitive, efficient input supply and credit programmes is a long-term process. Such support





institutions are critical elements of AKIS/RD, and are necessary for the sharing of impacts of other knowledge and information programmes.

In Africa, credit institutions often develop at the local level. In Cameroon, for example, there are traditional savings and credit structures at the local level in different regions of the country. These institutions, known as "*Tontine*" in the local language of Northwest Province, are based on mutual trust. In Uganda, input supplies will be the responsibility of the private sector. In Cuba, urban agriculture has become a major source of food security, and there is a network of stores where agricultural producers can buy equipment, seeds and other supplies, as well as receiving technical advice. In Trinidad and Tobago, farmers' organizations and other stakeholder cooperatives provide inputs.

### **Physical infrastructure in rural areas**

#### ***Undeveloped rural infrastructure is a brake on rural development.***

Roads are as essential as markets, especially feeder roads. Electricity, clean water, schools and the other amenities associated with adequate physical infrastructure are equally important. Roads and transportation facilities are critical for agricultural producers who need access to markets. Such infrastructure is often most deficient in the remote areas or less favourable production environments populated by indigenous peoples and minority groups.

In Lithuania, as in many of the other nine developing countries included in this study, the rural infrastructure is underdeveloped. Along with other factors, this means that the quality of life is lower in rural than in urban areas, and rural poverty is widespread.

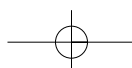
Cuba also struggles with poor physical infrastructure. In Malaysia, AKIS operators suggested that the government should play a proactive role in accelerating new technology transfer by providing substantial funds for infrastructure development. Undeveloped rural infrastructure is a brake on rural development.

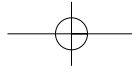
### **Coordination and joint planning**

#### ***Joint planning provides the main mechanisms for developing partnerships and networks that can make AKIS/RD effective.***

Collaborative planning and the exchange of information with their client groups and other stakeholders are important for AKIS/RD agencies and help them to respond to rural needs. Participatory planning and priority setting, client surveys and diagnostic studies, and client participation in oversight boards and programme evaluations help to orient programmes to the real demands of their client groups.

Collaboration in Cameroon is a concrete reality at the central as well as the provincial levels. At the programme level, the participatory approach has brought research and extension closer to end-users. In addition, multidisciplinary and interministerial teams have become the rule, and this development supports further cooperation between researchers and extensionists, as well as with rural organizations, most of which are controlled by women. Cameroon's current AKIS approach





recognizes and utilizes farmers' indigenous knowledge, which is introduced to extension agents, then diffused to research personnel and, subsequently, to other farmers. In this way extension services become a link between researchers and farmers, passing information down from research and up from farmers, while increasing their own awareness of both applied and indigenous knowledge.

Researchers in the Malaysia Agricultural Research Institute (MARDI) carry out field research in farmers' fields, although farmers do not actively participate with the researchers. Nonetheless, formal monthly planning meetings and weekly conferences between the Ministry of Agriculture and its agencies do facilitate joint planning and collaboration. Through this mechanism, the Minister meets individually with each agency director, and written decisions are followed up through a decision tracking system.

Several countries lack joint planning mechanisms (Lithuania, Pakistan, Trinidad and Tobago), and this is particularly true as regards education institutions. In Pakistan, for example, none of the universities and colleges has any joint education, research and extension projects or programmes, with the exception of Peshawar University in North West Frontier Province, where agricultural research institutes were placed under the university as part of a United States Agency for International Development (USAID)-funded programme many years ago. This pattern has not been repeated in the other three provinces. Since the 1960s, when universities were separated from agricultural departments, education institutions have remained divorced from agricultural research and extension.

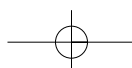
### **Education and training of agricultural producers**

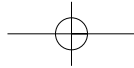
#### ***Education and training for agricultural producers is transformative, highly effective in developing society in general, and crucial to the success of AKIS/RD.***

Several case studies highlighted government efforts and investments in basic rural education (primary and secondary, as well as adult education programmes). Education is critical to AKIS/RD in that it empowers and capacitates rural people to take advantage of other opportunities and to take control of their own development. Almost all of the country case studies emphasized the importance of agricultural education and training, and almost all lamented the numerous constraints to such education and training. The problem is not new, as Box 1 confirms.

Although Lithuania is rapidly developing its AKIS institutions and promoting an AKIS/RD, many of its specialists still lack sufficient training in the utilization of information technologies, and there is a shortage of knowledge about the possibilities provided by these. According to the Trinidad and Tobago case study, the existing education and training system is not providing the knowledge and skills necessary for development of the agriculture sector, thus contributing to the lack of competitiveness of the domestic and export agriculture subsectors.

In developing countries, the curricula of agricultural colleges and secondary schools are often not related to the needs of the job market. The mechanism for changing curricula in educational institutions is rigid and does not respond to the reality of the world outside these institutions. For example, the Egypt case study states that the central management of secondary schools has led to a clear separation from the environment in which the schools are located.





#### Box 1: Constraints to agricultural education and training

Constraints to effective agricultural education and training programmes are many and serious. First, in developing countries, such programmes have been adopted rather than adapted from those of developed countries. Second, the objectives of agricultural education and training at various levels are often inadequately understood by policy-makers, as well as by administrators, instructors, students (and their parents) and the mass of small peasant farmers and farm workers. Third, the urgent need for on-the-job training of adult farmers has been largely unrecognized. Fourth, the curriculum content and teaching methodology of many agricultural institutions are not sufficiently relevant to national development goals in agriculture. Fifth, vocational guidance procedures are rarely used in the selection of trainees for agriculture. Sixth, in many schools, increasing the volume of production on school farms is more heavily emphasized than the attainment of agricultural education objectives. Seventh, defects in the attitude and competency of many teachers of agriculture are often reflected in the capabilities of their students. Eighth, in some instances, there is undue interference from vested interests in the policy formulation and administration of agricultural education and training programmes.

Source: Habito, 1980.

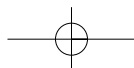
Capacity building and entrepreneurial training programmes can have a positive effect in changing economic and social life. In Chile's rural areas, human resource development stands out as a transformative factor with a great impact, especially notable as regards the technical aspects of business training, the organization of local cooperatives and the establishment of community organizations. This is the basis of Chile's social capital. In Lithuania, a modern AKIS that is responsive to changing markets and social needs is rapidly evolving. The Agricultural Chamber promotes agricultural knowledge and information exchange and serves the needs of its members, especially for market information. The adult education system is well developed and plans to promote greater specialization and quality in training programmes. The Moroccan Ministry of Agriculture considers agricultural extension to have a primordial role in agricultural development because it covers both information provision and the training of farmers, building their capacity in agricultural production and marketing techniques, professional organization, and the preservation of natural resources and the environment.

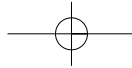
#### Gender inclusion

##### ***The importance of women in agriculture and agricultural research, education and extension is a source of strength that should not be underestimated.***

Lack of gender equity in development programmes and societies has long been recognized as a major brake on economic growth and poverty reduction. AKIS/RD programmes are particularly important in this regard given the large role that women play in rural production systems. Because the importance of improving gender equity in AKIS/RD programmes is so widely understood, it is surprising and sobering that more country case studies did not indicate progress in this regard.

Notwithstanding the low numbers of women in extension programmes in Morocco's Regional Offices of Agricultural Development (ORMVAs), in general the Project to Support Agricultural Development (PSDA) seeks to improve the well-being of farmers' families through training women farmers and financing a number of income-generating projects. Another of the project's innovations is to include groups of female farmers from areas outside the individual ORMVA in





field trips, thus encouraging the exchange of experiences related to the financing and management of income-generating projects.

In Cuba, women are given full responsibility and participate fully in social and economic development. Women constitute 58 percent of higher education students, and the first extension professionals to graduate from the Agrarian University of Havana were women. It is noteworthy that in Pakistan some AKIS institutions have taken gender issues into consideration in individual programmes.

The Uganda case study makes no special mention of gender issues under either current or future programmes. This is a lack in a programme whose framework for AKIS/RD appears to be operationally well conceived.

## **PARTNERSHIPS AND NETWORKS**

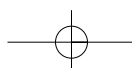
Effective institutional cooperation usually involves such structures as councils and committees that meet on regularly to review advances or setbacks in AKIS/RD. Partnerships are generally agreements that involve cooperation between the public and the private sectors. One example is public sector contracting with private sector entities for the delivery of extension services (Rivera and Zijp, 2002). Partnerships with agricultural producers and the latter's participatory involvement in programme development are central to a pluralistic AKIS/RD. Networks are of many kinds – informal usually being the best, if not necessarily permanent – and the use of communication technologies continues to provide major vehicles for networking. Modern technologies such as computers and the access they provide to the Internet and agricultural information are useful in developing specialized networks.

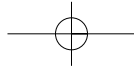
### **Structures and mechanisms for effective institutional cooperation**

#### ***In the final analysis, AKIS/RD is expressed in terms of effective institutional cooperation.***

There are various kinds of agricultural linkages: agricultural policy is linked to institutions and their programmes; knowledge and information institutions (research, education and extension) are linked to serve agricultural producers; and other agricultural support institutions (credit, supplies and marketing) are linked to the agricultural development process in general. There are also partnership linkages, in which the public sector links to agribusiness, NGOs, rural development agencies and other related organizations. All of these linkages are important and form the essential web of connections for agricultural and rural development to be successful.

Joint planning fora help AKIS/RD institutions to "get to know" each other in terms of their respective strengths, weaknesses and programmes. This can strengthen each institution's individual programme and provide a basis for more extensive partnerships and more effective mutual efforts towards AKIS/RD goals. Joint planning is key to developing policy-mandated rural development. Joint planning encourages AKIS agencies to align themselves strategically (i.e. through close linkages and mutual effort towards jointly conceived goals) and to seek partnerships with private sector AKIS entities. Joint planning makes the difference between AKIS agencies operating independently and their operating as a team of institutions to accomplish national and locally determined agricultural and rural development goals.





Linkages in agricultural knowledge support systems bring many benefits. When agricultural education, including workforce training and outreach programmes, links with research and extension, it produces skilled workers, upgrades the workforce and sometimes provides assistance to extension workers in the field. When research – including basic, applied and adaptive – links with extension (and also with agricultural [higher] education), it provides new (laboratory and applied) knowledge to extension, produces new knowledge in cooperation with extension agents in the field, and provides new knowledge to instructors at the higher education level. When extension links with research and agricultural education it provides agriculturally related information directly to farmers, supplies feedback on research trials to researchers and increases the information on farmers' needs that is available to researchers.

Chile has developed a variety of mechanisms for generating, transferring and diffusing knowledge and information to a multiplicity of stakeholders with diverse and not necessarily specialized goals. Egypt's Regional Research and Extension Councils (RRECs) and national campaigns are two powerful linkage mechanisms at the national and regional levels. In Lithuania, there is collaboration among research, extension and education, and good international links throughout the system. The agricultural extension service works on both community and rural development – not just on agriculture. Extension is responsive to market changes, and sensitive to Lithuania's integration into the European Community (EC).

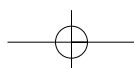
In Malaysia, formal and informal mechanisms link various operators for the purpose of joint planning and integrated operations within the context of AKIS/RD, and for assessing their suitability and effectiveness. As already mentioned, MARDI researchers carry out field research on farmers' fields to ensure the suitability of the research. In addition, formal monthly planning meetings and weekly conferences between the Ministry of Agriculture and its agencies facilitate joint planning and collaboration. However, at the field level, only some formal and informal collaboration takes place. MARDI has established a Research Council in which agencies and the university are well represented and that functions as a mechanism to promote integrated operation among these. Ad hoc committees operating between the agriculture agencies and the private sector appear to be especially useful in piloting R&D projects in a coordinated manner.

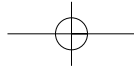
In Morocco, the Economic and Social Development Plan (PDES) links AKIS/RD operators. PDES organizes meetings every five years for AKIS operators and every two years for the Commission of Agriculture and Dams and the Committee of Education, Research and Extension, which is also known as the Subcommittee of the Technological Sector. Trinidad and Tobago has yet to establish mechanisms that emphasize the integration and coherence of policy formulation, planning and decision-making at the macro and micro levels.

#### **Existence of strong public–private partnership (institutional pluralism)**

***In some cases, the private sector can assume certain public sector responsibilities; in other cases it can serve to carry out public sector responsibilities more efficiently.***

There is an absolute need for knowledge in a fast-paced, rapidly changing world, and all available resources must be employed to compete in the twenty-first century. The private sector can play an increasingly important role in rural knowledge systems, but total privatization is not feasible, even for commercial agriculture (Hanson and Just, 2001; Rivera and Alex, forthcoming). The appropriate





mix of public and private roles can best be determined through piloting and learning from experience. Government must be realistic about the limits of fully private extension (as must donors). Nonetheless, including the private sector in extension systems is vital, and two strategies – subsidizing farmers to contract with the private sector and public sector contracting with the private sector – are already being employed. Because commercial firms provide many services directly, opportunities for public–private partnerships or public support for selected services from private firms is well worth exploring. In short, the public sector holds the key to policy reform directives requiring new or revised public policy vision, i.e. decisions to institute major structural and fiscal reform measures, including the involvement of the private sector. Only the public sector, i.e. national governments with the concerted help of their sub–governments, can assume these responsibilities.

The Trinidad and Tobago study argues that the State must become a facilitator of private sector activity and a supplier of essential public goods and strategic private goods. Increasing the incomes of participants in the agriculture sector is recognized as an extremely important policy objective, given that agriculture provides the lowest returns of all sectors in the economy. The Uganda study also recognizes that government will need to invest in developing private sector stakeholder capacities, in order to create a private sector extension competence from which agricultural producers can draw. Uganda foresees reform of the role and approach of agricultural advisory service providers, through a shift from public to private delivery of advisory services within the first five-year phase and the development of private sector capacity and professional capability to provide agricultural services.

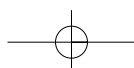
Morocco's National Programme for Agricultural Extension and Research (PNVRA) involves all relevant ministries in coordinating among themselves at both the central and provincial levels, as well as with private sector commodity organizations. The Morocco study argues that a policy that involves contracting the private sector for various services and a mandate that makes all those involved assume their professional responsibilities are required.

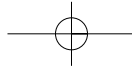
In Malaysia, the Third National Agricultural Policy predicts greater collaboration between the Ministry of Agriculture's agencies and selected private sector companies in the fields of research and large-scale agricultural production. Assistance to farmers in the formulation of business plans relating to farm and fishery operations also results in some collaboration between extension and the private sector.

### **Programme participation by agricultural producers and their organizations**

***As with demand-driven programmes, participation results in agricultural producers becoming more interested in technological and institutional developments.***

One key strategy to stimulate the development of small-farmer agriculture is to promote farmers' organizations. Such organizations have considerable potential to address the institutional and organizational problems involved in increasing the productivity and income-earning capability of small-farmer agricultural systems. This potential is somewhat belatedly recognized by governments and development agencies, in part because initial work with such groups took the leadership away from them and made them tools of development programmes, rather than independent actors working in their own self-interest (Collion and Rondot, 2001).





In Cameroon, the impact of the PNVR at the farmer level has resulted in farmers, both men and women, becoming more interested in a variety of agronomic and institutional developments. This interest has led to farmers becoming more self-dependent and creating rural organizations, such as the *Groupements d'Initiatives Communes*. In Malaysia, FOA's Board of Directors is considered a viable mechanism to ensure farmers' participation in planning, implementing and monitoring FOA's programmes.

Despite Egypt's efforts to advance linkages institutionally and through national campaigns, no mechanisms were identified that allow farmers to develop their expertise and participate in preparing extension plans.

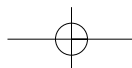
### **Effective use of mass media and modern communication technologies**

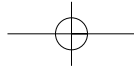
***Mass media, computers and related technologies are key to systematic field activities, as well as to administration, collaboration among related institutions, and the gathering, analysis and dissemination of information.***

Mass media and development communication technologies have been around for a long time, but have not been used to full effect. A multiple mass-media system consisting of a range of tools (printed materials [newsletters], telephone, radio, television, video and computer networks) can be utilized to support an evolving, pluralistic knowledge-based rural information system that serves multiple end-users. These multiple users might be newly emerging farms of various types, public and private institutions, communities, agro-industries, and departments of agriculture. Communication technologies also allow for the easy introduction of information other than agricultural, targeting other issues in rural development (FAO, 2002a). Communication and information services promote agricultural and rural development and can provide important networks and tools for the success of food security and food safety programmes. Additionally, these services often contribute a more participatory and integrated focus to projects that are limited to technology demonstration of such initiatives as participatory, community-based and targeted communication activities.

New information and communication technologies have the power to revolutionize AKIS institutions' ways of working. These tools carry most promise in delivering information to intermediaries in rural areas, but they can also make information and knowledge readily available to all potential users (e.g. through Internet access). Critical to the effective use of these technologies will be their connection with more traditional information and knowledge dissemination mechanisms, as when the Internet provides information for use on rural radio or in local newspapers, or when farmers and produce buyers use cell phones to check market prices or market requirements.

In Egypt, information and communications technology are currently being used to strengthen linkages between research and extension. The Virtual Extension, Research and Communication Network (VERCON) and Expert System technology are being employed in research institutions and by extension services within the Ministry of Agriculture and Land Reclamation (MALR). There are plans to extend this network horizontally to include more governorates and new stakeholders, and vertically to expand its contents. VERCON provides a space where research and extension communicate and cooperate. However, farmers have reported sometimes receiving conflicting





recommendations from the system. Uganda's current programmes make use of traditional technologies, as modern forms of communication are limited owing to their cost and the low levels of literacy in rural areas.

The Lithuanian Agricultural University and the Rural Business Development and Information Centre (RBDIC) have accumulated experience in the process of creating and implementing information systems. However, there is still a lower level of education in rural than in urban areas. There is limited financial reward for most agricultural producers, many of whom would like to acquire computer equipment and utilize e-mail. Some components of Agricultural Information Systems (AIS) are insufficiently developed, as is the communication infrastructure in rural area.

## **FINANCING SYSTEMS FOR INNOVATION**

The structures, conditions, partnerships and networks to advance AKIS/RD require investment; adequate funding is needed. In most cases, this will likely need to be provided by the public sector, and in some cases by assistance from international lending and donor organizations. Some funding can be acquired through cost-sharing arrangements. Most countries already charge a cess on export commodities, but the potential of cost sharing through fee-based services is being adopted increasingly as a viable and important means of forcing end-users to recognize the value of agricultural information and to contribute to its cost. Some specialists in the sociology of research and extension refer to this development from a different, but related, angle, noting the "commodification" of agricultural information (Buttel, 1991).

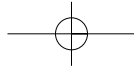
Financing strategies are more and more attuned to "developing markets for knowledge and information services". While this may be a sound long-term strategy, in the short term the challenge is to build a base for the development of such markets and to avoid situations in which public financing or programmes compete with or crowd out services that can be provided by the private sector.

### **Adequate funding for AKIS/RD**

#### ***Adequate funding for AKIS/RD is the linchpin of their operations.***

Public financing is generally essential to support a core AKIS/RD capacity. The achievement of a sustainable AKIS/RD depends in large part on having sustainable financing. This, in turn, derives from the system's productivity, relevance and effectiveness in addressing the needs of its clients, and on measuring and promoting awareness of its impact as a means of building political support for continued funding. Without this, an AKIS/RD is unable to create adequate capacity, mobilize human resources and ensure availability of the material means to achieve its expected goals.

In Cameroon, funding for research has been made competitive to encourage all public and private entities to engage in agricultural research activities. In Chile, at the time of the case study, extension services were still being paid in part by the public sector, but were being provided by the private sector with co-financing from agricultural producers. Despite the emphasis on private funding and competitive grants, costs still account for 20 percent of the National Institute of Agricultural Research (INIA) budget. One funding mechanism employed by Chile is the use of a



range of competitive funds and co-financed assistance programmes to support producers and producer groups. Uganda's PMA is viewed positively by the donors and is thus expected to benefit from a wide support base.

Cuba lacks adequate funding for AKIS/RD, and depends heavily on cooperation at the local level for the system's development. In Lithuania, despite AKIS/RD's rapid development, it appears that research funding is being reduced, even though research is generally productive. Cameroon and Uganda both receive funds for AKIS/RD from international and bilateral organizations, in particular the World Bank. Cameroon receives funds from the International Fund for Agricultural Development (IFAD), the African Development Bank (ADB) and Belgium, as well as from commodity companies. As with all the countries reviewed, Morocco's AKIS/RD requires adequate funding to support innovation and improve the quality of instruction, research and outreach. Inadequate financial, infrastructural and human resource development allocations are preventing Pakistan's AKIS institutions from developing.

### **Repartition of costs**

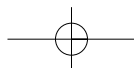
#### ***Cost sharing by major stakeholders promotes ownership in the AKIS/RD.***

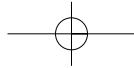
Repartition of costs is the dividing or distribution of costs. The term may refer to various methods of cost sharing, e.g. with end-users through fee-based payments for service, with private sector entities through co-financing and the distribution of costs to private sector providers, and via partial privatization or government payments to private sector entities for services rendered. However, these terms are separable concepts, and the distinctions among them are not always made clear.

Producer financing has long existed in the form of cesses on exportable agricultural goods. Fee-based repartition of costs through the user pays principle is the basis for commercial advisory and technical services (e.g. veterinary services) and is becoming more prevalent with public sector-financed or -delivered services. Co-financing is common when the State joins with the private sector in mutually beneficial projects. The partial privatization of public sector tasks, by way of contracting for services from the private sector, is also not new – and is much discussed in the current literature. Repartition of costs seems an inevitable occurrence as the commodification of knowledge and information becomes more evident, and the need for modern technological knowledge increases.

Regarding fee-based payments by end-users, it is generally an expected development that end-users pay part or all of the costs of services issuing from agricultural knowledge and information systems. However, one of the greatest problems with fee-for-service extension is that the producer often has limited knowledge of the value of the service until it has been received. "Determining ex-post willingness to pay for extension may offer little indication of the viability of fee-for-service extension or of appropriate fees to charge" (Hanson and Just, 2001).

Uganda's PMA envisages both partial privatization and fee-based repartition of costs for extension services. The plan foresees separating the financing of agricultural advisory services from government provision by creating options for the financing and delivery of appropriate advisory services for different farmer types, gradually reducing public financing's share of farm advisory costs and using public finance to contract privately delivered advisory services. In Malaysia, the





private sector is already cost sharing 5 percent of the research costs of MARDI, with the government paying the remaining 95 percent. Pakistan, as already mentioned, lacks the financial, institutional and trained human resources necessary to plan, implement and monitor programmes associated with AKIS/RD. Attempts at cost sharing are almost non-existent.

### **Investment to develop stakeholder capacities**

#### ***Investment to develop stakeholder capacities is crucial to the success of AKIS/RD.***

Community demand-driven development (CDD) programmes are in vogue, in which donors enable rural people to set priorities and the development agenda – typically by transferring funds to community groups to procure the goods and services needed for local projects. This often carries programmes towards agendas that cover more than agricultural production. Such direct financial control enhances producers' ability to express their demand for AKIS/RD services, and to get the types of services they want, by making service providers accountable for service quality. Other investments in rural people and institutions, although less direct, can also strengthen the demand for AKIS/RD services.

#### **Box 2: Which types of technical and institutional reforms?**

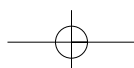
“Agricultural research activities must be directed at improving cultivation practices and irrigation techniques in order to increase cropping intensity. Credit must be made available to allow farmers with small farms to irrigate their land and thus increase their cropping intensities. ... Larger farmers' privileged access to machinery must be eliminated. ... All of these require an increase in power and influence of farmers with small farms, relative to those with large farms, and on government decisions concerning agricultural research and credit priorities. This could possibly be accomplished through land reforms or, a less radical solution, the organization of small farmers into groups that could put pressure on government agencies to recognize and respond to the interest of small farmers.”

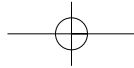
*Source: Grabowski, 1981.*

Farmers' organizations in developing countries often help to create demand for and supply of agricultural support institutions that effectively reduce the constraints to technology utilization in small-farmer agriculture. Byrnes (2001) notes that technological change depends on a mix of technical and institutional reforms that reallocate resources “so as to remove those resource constraints that are most inelastic and those institutional constraints that are most restrictive of growth and development”. He poses the question of which types of technical and institutional reforms will be required for technological change in agriculture, and cites a statement by Grabowski (1981) (see Box 2).

In countries seeking to develop AKIS/RD, investment to develop stakeholder capacities is crucial to the ultimate success of the strategic system. Financial and human resource development constraints may discourage joint planning between farmers and extensionists, educators and researchers, thereby frustrating attempts to promote AKIS/RD.

Training constitutes the most dynamic aspect of Morocco's PSDA. Training is directed at all the stakeholders in agricultural development (supervising staff, technicians, farmers, rural women, professional organization members). Pre-service and on-the-job training of staff in charge of





agricultural development has led to important qualitative changes in their working methods. The training of farmers not only improved their technical skills, but also transformed them into interlocutors who are better equipped to express their needs and define programmes.

## **INNOVATIVE FEATURES IN THE CASE STUDIES**

All of the case studies reveal some unique or innovative feature – whether the country seems to be at the threshold, on the road, or leading the way towards an effective, integrated AKIS/RD.

In addition, the national consultants contributed a number of insights (such as the diagram from the Pakistan case study, which is cited in this study as Figure 2). These insightful contributions are innovative and have been recognized throughout this study.

### **Adopting explicit policies and plans**

Most of the countries analysed have policies or plans for fostering the development of AKIS/RD. Uganda and Cameroon have the most explicit national strategies for this. A high-profile national plan or strategy statement can be an important tool to mobilize and coordinate the use of resources, but it does not ensure successful implementation of the strategy. Pakistan, and Trinidad and Tobago have formulated national plans, but these are only partially implemented. Donors may contribute international experience and objective analysis for the development of national strategies and plans, but national ownership is critical to sustainable implementation.

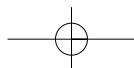
### **Targeting public goods**

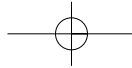
Most of the countries are targeting public goods, such as food security, natural resource management and clean environments. In 1986 in Chile, an Inter-Ministerial Commission for Rural Development outlined a multifaceted attack on rural poverty, which sought – among other things – to boost income-generating capacity through modernized agriculture and technology transfer. This programme used existing National Institute for Agricultural Development (INDAP) assistance for better endowed small producers (Integrated Technology Transfer Programme [PTTI]), and initiated a special programme for the previously neglected, smaller and poorer segment of the farming population (Basic Technology Transfer Programme [PTTB]). PTTB beneficiaries were small, marginal producers who were considered to have inadequate resources to achieve self-sufficiency from on-farm activities. INDAP considered the PTTB to have a primarily social emphasis. In contrast, PTTI focused on the productive/commercial development of participants, with social development arising as a secondary benefit. This is an excellent example of a country where the AKIS/RD thrust was concerned with both the public good and commerce.

Cuba explicitly includes the provisos of Agenda 21 into its National Strategy for Science and Innovative Technology, emphasizing the importance of natural resources and the physical environment. Sustainability is underscored as an important component of every agricultural project. The government places great emphasis on food security, self-sufficiency and environmental sustainability.

### **Developing urban agriculture**

In line with its goal of targeting public goods, the Cuban Government officially encourages urban agriculture, which has become an important source of food, especially in Havana.





### **Promoting economic efficiency**

Case studies make little mention of the economic efficiency of innovation systems, with the exception of Cameroon. The Cameroon case study estimates the cost of its PNVRA to be about US\$46.1 million, of which \$29 million are for programme investments and \$17 million for recurrent costs. The total annual costs (both investment and recurrent) of the extension programme represent about 0.4 percent of agricultural GDP, excluding forestry extension programmes. It is calculated that recurrent costs amount to about US\$10 dollars per farm household. Therefore, the case study argues, investments in research and extension are a productive way of using public funds.

### **Designating AKIS/RD units**

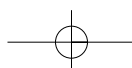
In Cuba, the Agricultural Extension System (SEA) appears to be a designated AKIS/RD unit that collects data on AKIS/RD-type developments. Uganda claims AKIS units in both research and extension, but also states that there is a lack of adequate resources and staff to make these units operative. Units are also hampered by the lack of linkages and collaboration among public sector AKIS institutions. A sustainable AKIS/RD depends on establishing adequate structures to facilitate the mobilization – from both the private and the public sectors – of human resources and the material means to reach the expected goals. Establishing an institutional unit or placing an individual in a key ministry or AKIS/RD agency charged with promoting collaboration and linkages can be critical to AKIS/RD development, even though it is not a sure solution (as evidenced by the failure of many research–extension linkage units). Such coordination mechanisms are more likely to succeed when they have input into the allocation of budgetary resources.

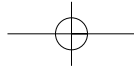
### **Strengthening human resource management**

Actions to support AKIS/RD require that the management and programme development skills of public sector agricultural extension staff be strengthened (Alex, Zijp and Byerlee, 2002). Management will be required to assume new tasks, such as: developing ongoing services and collaboration with the private sector; appraising the private sector's potential to contribute to agricultural extension delivery services for productivity purposes, and involving the various entities in that sector in cost-beneficial agricultural extension delivery services; and training national, district and local agricultural extension staff in the skills required to assist the joint execution of AKIS/RD activities.

Cameroon found that a strong system of central and provincial supervision is important for AKIS/RD development. The central structure is made up of seven units. While not necessarily innovative, this system of supervision stands out because of its systematic organization and attention to each of the project goals. Supervision in the ten provinces falls under nine units, which essentially carry out tasks similar to those undertaken by the central structure.

The Cameroon and other case studies also mention the importance of managing human resource development – a task that used to be known as "personnel" but that now includes a far broader horizon of responsibilities. Human resource management (HRM) in the public sector is involved with workforce planning, the measurement of results, and how best to invest in human capital. Strategic HRM deals with several questions: 1) What do we want to accomplish in our organization? 2) What kind of work does this involve? 3) What kind of people do we need? 4) When will we need them? 5) What will they have to do to be successful? 6) How will we know whether they are successful? and





7) What changes in current staff are necessary (Cipolla,1999)? These are questions that demand strong leadership, as they involve the central core of development systems.

#### **Using compact discs and the Internet for diffusing information**

In Cuba, whenever new and pertinent information arises, compact discs (CDs) are generated and distributed around the country to staff in the AKIS and other relevant organizations. This innovative feature underlines the potential of modern technology in promoting linkages among institutions, groups and individuals.

In Malaysia most government agencies maintain active Web sites, which can be visited by the public. However, at the time of the case study, accessibility for farmers was an issue because interconnectivity was only at the State level, while district offices were only just receiving their computer equipment and had not yet been connected to the Internet.

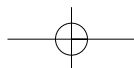
#### **Advancing decentralization and subsidiarity**

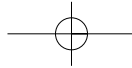
Case studies identified a variety of strategies that countries are employing to decentralize authority to municipalities and farmers, these include the following:

- Uganda's Decentralization Policy and Local Government Act give authority to municipalities and farmers to enable them to address issues of concern to local agricultural producers.
- Cuba set up a Forum on Science and Technology as a move towards disseminating knowledge and information about science and technology at the local level. This forum appears to be highly important for the country's present and future development.
- Pakistan's Research Master Plan for agriculture foresees the decentralization of much research administration to the provincial level. There is also a plan to devolve research authority to district administrations.
- Morocco has invested in the establishment of extension centres that serve as decentralized consultative institutional structures.
- In 1993, Lithuania established the Research and Studies Fund to facilitate better organization and financing of research and studies. The government provides the fund's main budget, although contributions also come from private supporters (including private nationals, foreigners, international organizations, enterprises, foreign governments and institutions).

#### **Using online monitoring systems**

Malaysia has initiated the online monitoring of district programme implementation. This monitoring mechanism has been implemented in all Ministry of Agriculture agencies as an efficient way to enhance information flow, transparency and the efficient monitoring of activities. The monitoring of spending through online mechanisms also provides an innovative and efficient way to regulate the expenses of government agencies. Before instituting this online system, it was almost impossible to calculate expenditure over the budget allocated.





### **Ensuring stakeholder participation in programmes and projects**

Given the need to democratize the rural sector, the present emphasis on stakeholder participation in programmes and community demand-driven projects seems correct. Questions of rural youth, minority groups and rural women need to be considered, because women often do as much if not more of the agricultural and other work than men do, and youth are the generation of the future. The remaining challenge is how to start integrating AKIS agencies into pluralistic networks for the common good. Given the new AKIS/RD vision of AKIS institutions, some governments have already begun to organize multisectoral networks of AKIS agencies and organizations, and support all the sectors involved in agricultural knowledge and information development.

### **Employing farmer-to-farmer initiatives**

As part of government support to AKIS/RD, community-based organizational activities cover a wide array of approaches, including farmer participatory research (e.g. farmers and researchers working to generate original knowledge), participatory technology development (e.g. farmers and researchers working to adapt existing knowledge to new situations), Farmer Field Schools, farmer-to-farmer programmes, and study circles, not to mention farmer fora, farmer networks and workshops. Farming knowledge is varied and includes existing and new information, known and proven practices, and traditional indigenous knowledge. Decentralized management approaches are essential for community involvement and the development of effective client-driven activities.

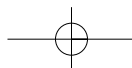
Farmers need to be brought more fully into technology development and dissemination activities. Farmer-to-farmer extension is one means of activating peer-related development and underlines the reciprocal relationship between technological change and wider economic and social development.

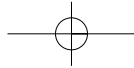
#### **Box 3: Farmer-led extension**

Farmer-led extension programmes involve farmers in extension service delivery. Farmer-extensionist initiatives have proliferated in response to dissatisfaction with the results from traditional extension programmes and reduced funding for public extension. Farmer-extensionists (or promoters) are key to farmer-to-farmer extension, which has been successful in Central America. Throughout South America, the International Centre for Tropical Agriculture (CIAT) is promoting Local Agricultural Research Committees (CIALs). Farmer-led extension can be effective, but almost always requires support from an external extension agent or institution

*Source: Alex, 2001.*

Egypt has initiated farmer-to-farmer extension programmes, which have proved helpful in bringing farmers together and encouraging them to exchange knowledge and adopt new techniques. Cuba's National Association of Small Farmers, established in 1997, has embarked on a farmer-to-farmer programme that forms a central part of its agricultural training and development strategy. One of Cuba's projects is engaged in Workshops on the Organization of Local Experiences, which is both a tool for disseminating information on best practices in different spheres of agricultural, industrial and service activities, and a means of helping agents and producers to review their activities and consider what was most useful or difficult in their implementation.





### **Emphasizing agricultural education**

Uganda's PMA foresees the development of a curriculum for general agricultural education. Morocco's high schools have also been improved by including agricultural technology in the curriculum.

Agricultural producers require basic, general education. Literacy and numeracy skills are often lacking, as noted in the Malaysia case study. Producers also need technical training and introduction to new technologies related to agricultural tasks (farming, livestock rearing, fisheries and forestry) and communication. Lithuania points up the potential of computers for enhancing linkages and information transfer among the rural population. Cuba shows how CDs can supply rapid information about new agricultural technologies to professional staff and end-users.

### **Instituting business planning programmes**

The elaboration of business plans for agricultural activities, such as farming in Lithuania and farming and fisheries in Malaysia, tends to promote collaboration between, respectively, extension and credit institutions, and extension and the private sector.

### **Promoting public-private cooperation**

High rates of adoption of improved agricultural technologies occur when government organizations, NGOs and private organizations form partnerships to extend agricultural technologies to farmers (Ojha and Morin, 2001). The adoption of improved technical recommendations appears to be partnership-specific, and partnerships in turn are context-specific. However, a pluralistic institutional framework requires that programmes be planned, implemented and evaluated jointly by multisectoral service providers on a location-specific basis, in cooperation with the private sector and farmers.

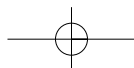
Malaysia's Third National Agricultural Plan for 1998 to 2010 portends a crucial role for the private sector. In preparation, the country has devised ad hoc committees to operate between agricultural agencies and the private sector. These committees have already been useful in experimenting with the coordination of pilot development projects. The committees are composed of representatives from agencies of the Ministries of Agriculture and of Primary Industry operating in research, extension and education areas.

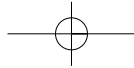
Trinidad and Tobago's innovations are mainly in agronomic areas, e.g. cocoa, sugar cane and the introduction of integrated pest management (IPM) practices. However, as already noted, in 1995 the government decided to contract with the private sector to combat infestation by the hibiscus mealy bug.

### **Including producers in programmes**

Consistency and continuity are important when implementing strategies aimed at producer participation in AKIS/RD programmes. Chile was one of the first countries to enable its private sector providers and to decentralize the agricultural extension system. This occurred under three different governments, which continued the country's movement towards incorporating agricultural producers in programme participation and funding. This decentralization of the system has proved quite effective.

Pakistan has launched Pilot Area Real Life (PARL) projects, which deserve attention for their incipient participatory practices of including producers. PARL projects bring together all the





development partners in an area to focus on the development of the farm household as a unit, with a view to achieving long-term rural development. PARL projects are being tried in all provinces, but results are still pending.

#### **Utilizing modern communication technology**

Several of the country AKIS/RD are using audio, video and written materials effectively. Egypt's Central Administration for Agricultural Extension Services (CAAES) has improved its organization and efficiency through the effective use of such media.

Computer connectivity for technology transfer is also expanding, although its lagging in rural areas is a continuing constraint. Egypt, Lithuania and Malaysia stress the value and potential of computer connectivity for enhancing AKIS/RD.

The VERCON system, which was promoted by FAO and piloted in Egypt, is beginning to reach out to other ministries and regional centres, and is a significant innovation that other countries would do well to adopt. In addition, the Ministry of Agriculture's Central Laboratory of Agricultural Expert System prepares CD packages of expert systems for analysing agronomic problems – an innovative boon to Egyptian farmers.

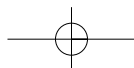
Lithuania's agricultural knowledge and information innovations include adult continuous education systems and centres, the growing use of computers in schools and some rural organizations (including access to the Internet and international Web sites), the establishment of a Rural Business Development and Information Centre to promote an AIS, and publication of the *Farmer's Advisor* newspaper and other farm-related periodicals.

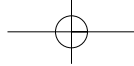
Malaysia's MARDI has started to use the Internet as a method of technology transfer, for example, the Rubber Small Holding Development Authority is at the planning stage of this. However, other operators have not shown interest in using the Internet for technology transfer because they view the majority of Malaysian farmers as being poor, illiterate and lacking in the knowledge and skills to use computers. These operators think that the future farmers of Malaysia should be better educated. Recently, the Department of Fishery has taken steps to educate future fishers at its training institutions.

#### **Investing in stakeholder capacities**

None of the countries reviewed showed any major innovations in the area of financing institutional development or securing partnerships with other AKIS entities. Most of the AKIS-related activities undertaken in the ten countries have already been established, although the case studies indicate constraints due to lack of resources, as well as inadequate planning and poor linkages. Trinidad and Tobago states that the Ministry of Agriculture, Land and Marine Resources lacks the necessary resources to develop the economic and productive practices necessary to advance an effective AKIS/RD. Some cases, Lithuania for example, complain that external funds are scarce and not easily accessible, while others indicate that sufficient financial resources are forthcoming; Malaysia, for example, found that this was the case, once the Third National Agricultural Policy had established agriculture as a strategic sector.

Malaysia has begun to invest in stakeholder capacities via FOA, which operates under the aegis of the Ministry of Agriculture and promotes farmer organization. FOA's main programme at the

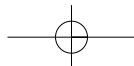
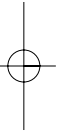
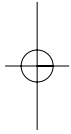


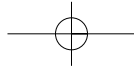


grassroots level is to facilitate agricultural business within the area of each Farmers' Association (FA). While FAs are directly linked to FOA, extension does not have any direct linkage with the farm operator who represents the local FA.

#### **Exploring diversified funding for AKIS/RD**

Various means of cost recovery need to be, and are being, explored. At present, the main source of funding is the State. In Lithuania most AKIS/RD costs are covered by the State budget, but funds may sometimes become available from other sources, such as local communities that have partnerships with research and extension, public and semi-public corporations, large farms and trade organizations, and – gradually – successful agricultural producers. In Eastern Europe, the World Bank is exploring the use and value of competitive grants for developing AKIS institutions, as noted in Section 1. Sources of funding other than the State will be discussed in greater detail in the following section on Lessons learned.





## 4. LESSONS LEARNED

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So far, this study has been organized around the five priority areas and their indicators. In this section, this pattern is modified to underline, instead: 1) global forces and agriculture; and 2) the different roles in advancing AKIS/RD played by government, AKIS agencies, private sector AKIS entities, agricultural producers and their organizations, and the media and communications.

### **GLOBAL FORCES AND AGRICULTURE**

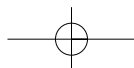
Global forces that are affecting all nations demand changes throughout agriculture sectors, particularly in agricultural knowledge and information systems. For example, the Malaysia case study states: "Agriculture shall always remain important and strategic in nature, especially in substituting imports, production of strategic commodities, production of food and in earning foreign exchange."

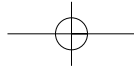
The global forces affecting agriculture reflect the rapid and innovative changes in the world, many of which are positive but some of which are deeply troubling. These forces include international trade and global competition; population dynamics; scientific and technology development; rapid modern communication technologies; land use, e.g. the loss of arable land and the drift towards degradation of the natural environment; structural changes in institutional development and the redefinition of government's role in development; the supply of and demand for trained workers; and the increasingly obvious effects of poverty, illiteracy and poor quality of life. The challenge of responding to these forces is rendered even more difficult by limited public sector financial resources.

One response to these global forces is the current effort to improve agricultural research, education and extension systems. The challenge is to help them take on the character of (sub)systems that are engaged more closely among themselves and with the private sector, particularly agricultural producers, in a concerted effort to move closer to the goal of developing an effective, integrated AKIS/RD.

### **THE ROLE OF GOVERNMENT**

Only national governments can assume socio-economic responsibilities that affect the State as a whole. For example, only they – along with state/provincial and local governments – can ensure that extension services deliver needed public goods, and only they are well placed to promote increased institutional pluralism in extension service provision and to oversee the quality enhancement and assurance necessary for rural development. Only government can make AKIS/RD work for the advancement of agricultural and rural development.





### **Political will**

"It took a change in leadership to inject a new outlook for agriculture in the country," according to the Malaysia case study. The study advocates: "Visioning and strategic planning must be believed and committed to in order for any new plan to work." These statements recall another similar insight, namely that "many development and extension efforts have failed because circumstances favoured frustration and nothing was tried to boost vision, dedication and creative problem solving, all of which cannot be imported" (Blum, 1987). Although the case studies cite excellent projects – e.g. the PNVRA in Cameroon, the extension centres in integrated development projects in Morocco, VERCON in Egypt – at the end of the day the visioning and strategic planning "must be believed and committed to" in order for new plans to work.

The case studies also show that the political will to develop a country's AKIS/RD may grow out of necessity or as a result of political or economic crisis, as in Cuba, Lithuania and Uganda. They also stress the key interdependencies of government and pluralistic AKIS extension systems. Table 3 gives some of the reasons why government needs AKIS/RD and why AKIS/RD services need government.

### **Institutional coordination**

Government's convening authority enables it to bring different service providers together to exchange information, develop new partnerships and collaborative mechanisms, and establish acceptable divisions of labour. Such government coordination can improve the overall efficiency and effectiveness of pluralistic AKIS/RD services. Table 3 underlines the essential factor of institutional coordination in developing AKIS/RD.

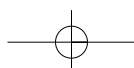
### **Policy guidance**

Policy guidance is necessary, as the present study highlights in Section 3, for several crucial purposes, the first of which is to advance national strategy and a plan for AKIS/RD development and operations. Government also needs to provide guidance in directing the strategy and plan towards the public good. Guidance is also required in continually focusing attention on the economic efficiency and impact of the system.

## **THE ROLE OF PUBLIC SECTOR AKIS INSTITUTIONS**

AKIS/RD requires the rethinking and reorganization of training, research and outreach activities. This means creating or improving synergies among the different agencies. AKIS institutions need to reflect on new strategies that are likely to orient future programmes towards further integration. The Morocco case study notes that, despite successes, the country's AKIS/RD needs to be adapted.

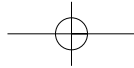
Many agencies are involved in implementing AKIS/RD without prior permanent identification or a global vision of the objectives. There is often a failure to take into account growers' expectations, the region-based realities and the situation of the agrosystems. Training, research and outreach actions are stagnant. Programme contents do not always evolve in compliance with the demand and specific needs of the recipients. In addition, outreach is increasingly solicited by other departments for conveying rural development messages with social or environmental connotations. Part of the emerging challenge is to deal with the diversity of individual household priorities and strategies.



**Table 3 - Key interdependencies of government and pluralistic AKIS extension systems**

	<b>Function</b>	<b>Rationale</b>
Government needs AKIS/RD for:	Public policy implementation	Implementation of public policies that enhance the public good often requires the education and mobilization of rural people in order to change their behaviour – an objective for which AKIS/RD extension may be the best or only tool available to national governments.
	Information collection	Information on agricultural conditions and rural populations can often be collected most easily and accurately by extension agents in the AKIS/RD who are already active in the field and knowledgeable about rural areas.
	Dealing with emerging concerns	As diverse new issues emerge on the agricultural agenda, AKIS/RD is the main rural system that governments have to address new socio-economic, political and technical developments, such as the environmental impacts of non-source pollution, animal welfare, fair business and employment practices, HIV/AIDS, and other human health issues.
	Responding to emergencies	Only higher levels of government, with the concerted help of local government, can respond effectively to many emergencies; AKIS/RD and their services are often the only widespread network of external – government or non-governmental – presence in rural areas.
AKIS/RD services need government for:	Risk bearing and sharing	Because government can bear the burden of risk more easily than individual agents can, government support may be essential in introducing new agricultural and rural development services, while promoting the institutional capacity of private providers to assume some, if not all, of these services.
	Information provision	AKIS agencies are key users of information on producers, social conditions, production systems, markets and technologies for planning and implementing extension programmes; government endorsement enhances the credibility and reliability of information.
	Funding agent	The State often serves as a funding agent for private sector provision of extension services. This is also one of the ways in which government can promote an enabling environment for the private sector.
	Regulation	Even when funding and delivery of AKIS/RD services are left to the private sector, however, public sector oversight and regulation is important to protect the public. A regulatory function provides a minimum set of rules and regulations to define the conditions under which research and extension activities can take place and to set standards for service delivery.
	Quality control and enhancement	AKIS/RD services rely on key support services, especially for the education and training of research and extension staff and for technical support from other sources of innovation. Government can bring important economies of scope and scale to AKIS/RD support activities.
	System coordination	The government's convening authority enables it to bring different service providers together to exchange information, develop new partnerships and collaborative mechanisms, and establish acceptable divisions of labour. Such government coordination can improve the overall efficiency and effectiveness of pluralistic AKIS/RD services.
	Promoting reform	Reform requires a policy vision and a national strategy for implementation, whether this involves decentralization, privatization, new contractual arrangements or user financing. Government must take the lead in defining new approaches and promoting changes in institutional capacity and interrelationships.

Source: Adapted from Rivera and Alex, 2004.



### **Cross-cutting issues**

Institutionally there are a number of cross-cutting issues, namely: the creation and role of AKIS/RD units within AKIS agencies to promote joint planning and to facilitate inter-agency linkages; the need for effective leadership, results-oriented management and professional training to foster AKIS/RD; a sound strategy for programme decentralization and subsidiarity; and the functional performance of AKIS agencies, their M&E systems and their impact assessment procedures.

To promote the demand for innovation, institutions must consider: which methods are most appropriate for enhancing demand-driven approaches in public sector programmes; the costs of investing in agricultural markets and market accessibility for agricultural producers; how best to support input and supply systems; what priorities to adopt first in developing rural physical infrastructure; how to coordinate and jointly plan with other AKIS agencies, the private sector, and agricultural producers and their organizations; the critical needs of staff and stakeholders for education and training; and the best ways and means to recognize women's contribution, potential and involvement in the agriculture sphere.

Institutions have the major task of creating partnerships and networks. Questions that arise in this regard are: Which structures and mechanisms need to be created for effective institutional cooperation? How can public-private partnerships best be established? What are the best means for promoting the effective execution of participatory programme involvement by agricultural producers and relevant stakeholders? and How can the effective use of traditional and modern communication technologies be ensured? Most important, how can AKIS institutions promote "uptake pathways" for innovation, rather than simply transferring technology?

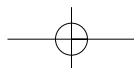
### **M&E and impact assessment**

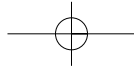
The main areas of collaboration among AKIS/RD operators tend to be in the planning, implementation and monitoring of project activities. In terms of planning, the agencies of the Ministry of Agriculture in Malaysia were found to collaborate well, especially at the director level. This was facilitated by monthly administrative meetings and weekly conferences with the Minister of Agriculture. At the field level, some formal and informal collaboration existed, but no formal mechanism for collaboration was found at the operational level.

As for project implementation, the Department of Agriculture and MARDI collaborated to produce food crops and ornamentals. This arrangement was agreed to at the State or headquarters levels of both agencies. MARDI also collaborated with the private sector in producing new feed materials and in improving the quality of palm olein oil. But there was little collaboration among the operators in M&E processes. In general, data from programme M&E, as well as impact assessment, should be shared across the AKIS/RD, particularly with agricultural producers and their organizations, so as to determine where problems exist and to involve all stakeholders in finding solutions.

### **Agricultural research**

Agriculture (including crops, livestock, fisheries and forestry) is hugely important to the ten developing countries under analysis. Research institutes, universities, NGOs and private companies are all involved in research to find new ways of improving the production and value of agricultural products. While some research activities solve specific scientific problems, others give policy-makers the tools and methods they need to guide the evolution of agriculture in their





countries. Research can also provide quantitative and qualitative assessment of the effectiveness of agrarian practices and institutional policies. Areas of study include farm management, food safety, and rural development.

Today's research challenges include maintaining competitiveness, managing and using resources in a sustainable manner and meeting consumer demand and needs. Maintaining competitiveness has implications for employment levels and working conditions in the agriculture sector. Managing and using resources in a sustainable manner is critical for future development. Meeting consumer demands and needs means focusing on delivering high-quality products that meet market requirements but that are also safe for the consumer and sensitive to the environment. The success of research development work does not end in a publication. As the Malaysia study argues, research needs to be translated into technology that can be developed further for large-scale production or for the improvement of current agricultural products.

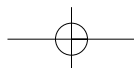
The new challenge for research is to provide support for a range of pluralistic AKIS/RD participants, including policy-makers, the private sector and other stakeholders. Research also needs to ensure a long-term perspective and not to respond only to client demands for quick results; this emphasis on quick results is often also a problem for donors. Institutional sustainability is an issue, because donor funding is usually for at most six to eight years, which is short-term for research. For small countries, the result of this has been a repeating cycle of diminishing capacity development and deterioration. Developing constituencies and sustainable funding for research is critical.

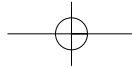
Moreover, technology and management innovations must be seen in a broader context. All innovation does not emanate from research institutes. In most countries, the majority of technology and innovation is often imported. Developing countries need to become better at seeking out and attracting technology from other institutions. This can be helped by the creation of an improved investment environment and stronger international linkages.

A coordinated approach to public sector research planning and priority setting is essential to maximize efficiency. Instead of a scattered research effort divided among different government ministries, Uganda has created a single body, the National Agricultural Research Organization (NARO) under the Ministry of Agriculture, which carries out agricultural research guided by national development policies and objectives. Several lessons were learned, including: the need to improve the flow of technologies to farmers; the need for institutional reforms within the concept of decentralization and farmer empowerment to make their demands felt; and the need for stronger partnerships with other AKIS domains and with the private sector.

In Cameroon, MINREST supervises the Institute of Research and Agricultural Development (IRAD)'s management and research activities, and provides a legal and operational framework for its cooperation with universities and institutions abroad. Priority setting and long-term planning are still not a pervasive process in Cameroon or in the individual institutions. However, recent reorganization following the country's comprehensive strategic planning process holds new promise.

Research in many countries, such as Egypt, would benefit from improved technical capabilities, financial resources and linkage mechanisms. AKIS agencies need to cooperate closely with the private sector, in particular with NGOs, in order to gain greater access to scientific materials and to promote the institutional infrastructure. The Pakistan case study argues that Pakistan must





develop a viable NARS based on the needs of farmers, agricultural scientists and all other stakeholders in the public, NGO and private sectors.

### **Agricultural extension**

The changing nature of agricultural information and the new global ideology are significantly shaping developments in extension. Both the public sector's agricultural extension education institutions and the private sector's technology transfer activities are affected.

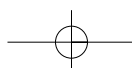
Agricultural information is changing in terms of its content, the means by which it is transferred and its marketability as a "commodity". Its content has been changing since the chemical industry's entrance into the agricultural domain in the mid-nineteenth century, and more radically since the Green Revolution of the 1960s. The means of transfer have been advanced, chiefly in high-income countries, by the modernization of telecommunications and the popularization of computers, which provide immediate access to, for example, information on farm commodity prices worldwide and localized weather conditions. As Zijp (1994) notes, information technology is making both public and private sector agricultural information systems more accessible and more rapid in transmission. The commodification of agricultural information, i.e. the transformation of knowledge into a product for sale, has begun to revolutionize both public sector extension and the business of private sector technology transfer.

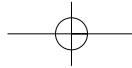
The nature and content of agricultural information have certainly changed, and will continue to change. In addition, the agricultural modernization process is likely to spread from developed and emerging economies to the less developed parts of the world. Current global trade negotiations are likely to increase the private sector's socio-economic hegemony and accelerate the transition towards a global market economy. The commercialization and privatization of agricultural knowledge support systems, particularly public sector research and extension, will continue. International organizations and the pressures of the global market will move the world towards greater market interdependency.

As underlined in Section 1 of this study, the ten countries involved are at different economic and institutional stages of development. As regards extension, some are committed to public-private partnerships through contractual arrangements. In hierarchical countries, however, extension is not yet autonomous and has no authority to take administrative and financial decisions or to plan its programmes according to the availability of resources.

All need to evolve demand-driven decentralized approaches that envisage participation in programme planning, management and evaluation by all stakeholders – farmers, research scientists, educators, representatives of other nation-building departments, NGOs and the private/corporate sector and agriculture input/packaging and supplying companies.

As for human resource development, the progressive introduction and use of information and communications technology (ICT) appears to be recommended within the constraints of available trained human resources, infrastructure facilities and operational funds. ICTs can help to meet effectively the shortage of trained extension personnel and reach large numbers of target audiences, including the poor living in remote areas. In short, countries such as Pakistan appear to need greater linkages to agricultural information agencies, and these linkages should be strengthened by the use of mass media in both the public and private sectors, easy-to-read and –





understand written and audiovisual material, such as leaflets, posters and brochures, and the preparation of video tapes and radio programmes.

All the studies emphasize that AKIS institutions should promote training at all levels, covering the pre-service, induction and in-service training of different categories of personnel. Training should be participant-oriented and participatory, with practical application – not just lectures and testing. It should employ the principles and techniques of adult education. Women should be recruited and trained as administrative staff and as extension staff to work with girls and women in rural areas in order to help them to increase their contribution to family incomes. Extension in many countries needs to employ more female workers in women-related programmes, as well as in extension administration. There is a need for more training courses for women to learn new technologies.

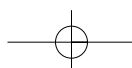
Extension should also establish strong linkages with agricultural universities, colleges and training institutions, federal agricultural and education ministries and provincial agriculture and education departments, as well as private and corporate sector representatives. In turn, agricultural universities and colleges should work closely with extension and other public agencies and private organizations to prepare relevant curricula and participate in joint sustainable plans that provide practical training facilities to final-year agriculture students. This should be along the lines of medical training, in which students spend the last year of their graduation programmes as hospital interns under the supervision of a practising doctor.

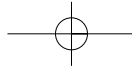
Motivation is always a factor, and attractive salary scales, prospects for career development and rapid promotion, and special allowances should be offered to extension personnel so as to attract qualified and committed staff. Such incentives should depend on increased results and impact from AKIS services. At present, the salaries, benefits and career development opportunities for extension staff are substantially lower than those of staff in other disciplines such as research, and this discourages bright university students from selecting agricultural extension as a major.

Uganda's NAADS play a significant role in the implementation phase of AKIS/RD in that country. The fundamental aim of the programme is to develop a demand-driven, client-oriented and private agricultural service system. NAADS foresees the opening up of partnerships with the private sector and other partners in service delivery. Committed to pluralistic and participatory approaches, NAADS is planning to develop mechanisms for farmer empowerment, which should improve the relevance, content and effectiveness of service delivery.

*Basic education and literacy:* A key ingredient for farmers to benefit from the AKIS/RD system is literacy and numeracy. In Uganda, universal primary education and the Adult Literacy Programme are being pursued, with funding from the Poverty Action Fund. Various related programmes are being carried out by the Danish International Development Agency (DANIDA), as well as by NGOs and community-based organizations (CBOs). NGOs are a considerable asset in advancing the goals of AKIS/RD.

*Secondary education:* In many developing countries, the agricultural education component of secondary education is poor. In many countries, such as Egypt, the curricula of agricultural secondary schools need to be updated in order to reflect new agricultural technologies, secondary school students would benefit from training on private farms, and secondary school teachers require training at diverse agricultural organizations and institutions.





Rural children and youth should have the same access to quality education as their urban counterparts. This will require maintaining schools in rural areas, organizing school networks and activities that comply with local needs, upgrading facilities, and introducing new teaching technologies. In many cases, literacy and numeracy are key dimensions in agricultural producers' ability to benefit from AKIS/RD.

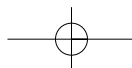
*Technical/vocational education:* In Pakistan, the planners and implementers of technical and vocational education found it useful to prepare a realistic national plan of action for the quantitative and qualitative expansion of a technical/vocational education programme for both men and women. The skill areas offered by technical/vocational education institutions should be jointly identified and prioritized, which can be accomplished by involving representatives of programme beneficiaries, industry and the main nation-building departments. Inter-agency joint programmes of technical/vocational education need to promote collaboration with departments of agriculture, industry, education and rural development. Linkages could contribute to institutional and human resource development by providing training at degree and certificate levels and by offering short-term courses in agrotechnologies for local farmers.

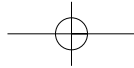
*Universities:* Agricultural universities recognize their teaching, research and extension roles, but are often unable to perform these well because they remain divorced from agricultural research and extension as a result of the separation of universities from agricultural ministries; have a multiplicity of administrative, financial and operational controls; have theory-oriented, centrally developed curricula; lack adequate M&E and impact assessment mechanisms; and lack adequate funding for library resources, textbooks, research and extension activities, and data handling facilities.

Malaysia argues that it is best to limit universities to producing degree-level professionals, because that is the core business of university teaching and research, while the specialized training required by specific agencies is best provided by the agencies themselves, through their own programmes of in-service training.

In order to learn from its experience of developing an effective agricultural education programme, the Pakistan case study suggests that countries should: decentralize the curricula development, teaching/learning experience, and education and training materials of each university and college institution, keeping in view the ecological and socio-economic situation of the area concerned; link universities/colleges and districts with each other for joint planning and implementation by establishing interdistrict and interprovincial networking for the sharing of institutional, human and research results, as well as instructional material and information for modernizing the use of available resources; and consider organizing more agricultural fairs, adaptive research farms, farmers' days, exhibitions, and interdistrict and interprovincial visits from students, teachers, researchers and farmers for sharing experiences and information related to modern agricultural technologies on one hand, and development of participatory and problem solving decision-making skills on the other hand.

The Pakistan study also suggests that educational institutions need to: prepare a master plan for workforce development to meet the ever-increasing need for trained human resources covering all disciplines, by providing pre- and in-service training facilities to all; prepare a sound human resources policy with clearly defined recruitment and promotion procedures and attractive salary scales and incentives that encourage more qualified staff to enter agricultural education; make





appropriate arrangements to provide additional training and institutional and material support for encouraging the use of ICT in teaching and the transfer of agricultural technology from researchers to end-users (farming communities) and from technology adopters to researchers; and seek the delegation of powers and authority for financial control in order to provide quality education.

## **THE ROLE OF THE PRIVATE SECTOR**

At the heart of any discussion about contemporary agricultural information, its transfer and exchange is the fact that agricultural knowledge has to a large extent become commodified (Buttel, 1991). Worldwide, newly generated agricultural knowledge is becoming a priced commodity. In developing and less developed, as well as in industrialized, countries the provision of agricultural knowledge is increasingly fee-based. Always an economic good, agricultural information is increasingly seen as private property to be protected by law through patents and copyright, and to be provided to select clientele at a price.

As a result of the commodification of agricultural technology, the private sector has taken on an increasing role in information transfer, especially in the food and agriculture processing industry. This role is likely to increase as giant transnational enterprises gain greater control of the production and sale of commercial products for agribusiness, food and pharmaceuticals. However, it is important to avoid dogmatism for it is difficult to see what the food security needs of the world's peoples will be in the coming decades of the twenty-first century. It is equally difficult to predict how the State and the private sector will develop, and whether there might be another "power shift" in the future.

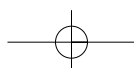
Private companies and NGOs provide many and diverse services, as do RPOs and agricultural producers. The role of private sector entities in society and economics is increasingly recognized, although their integration into the socio-economic system is often overlooked (Rondot and Collion, 2001).

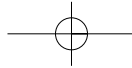
To enhance private sector coordination, rural development boards need to be developed, under the aegis of government, but with representative from various private sector bodies (companies, non-government institutions, RPOs, etc.). Private sector organizations can significantly affect the relative success or failure of AKIS/RD.

### **Private sector investment**

For the private sector to invest in agricultural development it must be convinced about the new technology, and the government must meet it halfway by making appropriate investment available and providing the necessary incentives. Private sector involvement in the delivery of information services can improve the quality of the services provided.

With globalization and liberalized trade, agricultural institutional linkages promise increasingly to benefit government, as well as agricultural producers, input suppliers and other stakeholders. Markets and policy mandates provide an impetus with pertinent macroeconomic realities. Information is needed on markets and production. Farmers (including poor farmers) require competence in linking agricultural production to agroprocessing, marketing and the creation of farmers' organizations. The domain of each agricultural discipline is only a small part of the total





system. Ultimately, the concept and practice of extension need to be expanded to include a variety of rural development purposes and to prepare extension specialists who respond to on-farm and off-farm agricultural livelihood opportunities.

## **THE ROLE OF AGRICULTURAL PRODUCERS AND THEIR ORGANIZATIONS**

For AKIS to be successful, beneficiaries need to be actively engaged in the planning, implementation and monitoring of programmes in order to instil a sense of ownership and promote sustainability. The costs and potential benefits of participation are reasonably well known. As enumerated by the World Bank (1994), costs comprise the up-front financial, time and opportunity costs to the organization and stakeholders of identifying and engaging with each other. In addition, there are a number of potential difficulties, such as ensuring that stakeholder groups are representative and express the priorities of the people they are meant to represent; the risk of generating or aggravating conflicts between stakeholders with different priorities and interests; the risk of raising expectations that may prove impossible to fulfil; and the risk of the participation process being co-opted by powerful and more articulate elite groups to the exclusion of the poor and disadvantaged.

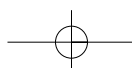
On the other side of the equation, benefits include a way of checking the relevance and appropriateness of the processes and products of development efforts; stakeholders' increased commitment to and ownership of policies and projects, as well as their willingness to share costs and their interest in sustaining the benefits; greater efficiency and understanding, and better planning based on the concerns and ideas of a wide range of stakeholders; a better match between human capabilities and physical capital investments; greater transparency and accountability and improved institutional performance; enhanced information flows, which allow markets to function more efficiently; increased equity by involving the poor and disadvantaged in development efforts; and strengthened capacity of stakeholders as a consequence of their involvement in development efforts (World Bank, 1994).

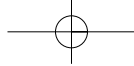
One of the universal prescriptions for the effective management of public services, such as agricultural research and extension, is "partnership with farmers and implementing participatory approaches" (Rivera, Qamar and Crowder, 2001). Farmers' involvement in managing extension services and determining extension programmes can serve to enhance the institutionalization of the empowering process. An effective means of empowering agricultural producers is to create an enabling environment for them to establish RPOs.

### **Gender issues**

The Trinidad and Tobago case study suggests several ways of overcoming gender-based inequities in society: women's groups make greater efforts to be aware and informed at all stages of the planning of regional programmes, projects and activities with gender applications (Gumbs, 1990); women become more involved in external marketing (Saul, 1990); and curricula in tertiary educational institutions be adjusted to reflect the needs of women employed in the agriculture sector (Fletcher-Paul, Roberts-Nkrumah and Johnson, 1990).

The Trinidad and Tobago study also draws attention to the relationship among the unpaid, invisible work of women in agriculture, the underestimation of the informal sector's contribution to





agricultural development, and inappropriate planning and development approaches (Paul, 1994). Paul also notes the importance of establishing mechanisms that emphasize the integration and coherence of policy formulation, planning and decision-making at the macro and micro levels, while at the same time incorporating gender analysis methodology as a vital and necessary component of the planning process. In short, AKIS/RD actors must be aware of the need for gender-sensitive research agendas and education and training curricula, as well as for the careful analysis of gender issues in extension programmes at the policy, planning and operational levels.

### **Rural producer organizations**

Donors now recognize that the cornerstone for generating broad-based increases in agricultural productivity and farmer incomes in small-scale agriculture in developing countries lies in improving farmers' access to essential resources. While small farmers make productive use of available land and labour, they typically have little or no control over many other essential agrosupport factors (e.g. technology, credit, fertilizers and market information).

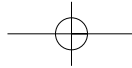
Evidence also suggests (Byrnes, 2001) that farmers' organizations can help small farmers in developing countries to improve their access to and use of essential agrosupport factors. Farmers' organizations can greatly improve their members' access to and management of essential production and market resources.

As farming and market conditions undergo rapid changes, a large part of the rural population finds itself in need of additional training or retraining. Farmers in many countries would profit from an increase in the number of training courses in new technologies, and young farmers and graduates would gain from training in problem analysis and utilizing the participatory approach. Coordination mechanisms are needed among the advisory councils serving farmers, and support is needed for the establishment of farmers' organizations. NGOs can be instrumental in assisting in these tasks. Farmers have important roles to play, not only as producers, but also as contributors to the AKIS development processes.

## **THE ROLE OF MASS MEDIA AND COMMUNICATION**

Communication and communication technologies are crucial for the dissemination and gathering of information. Communication is a broad term that encompasses the process by which meanings are exchanged. Communication technologies have a long tradition in all forms of agricultural information generation, transfer and discovery. Traditionally, bulletins, newspapers, journals and (especially) radio have contributed to knowledge about new developments and best practices, as well as policy and institutional determinations that are relevant to agriculture and rural development. With today's new technologies, among them the computer and access to the Internet, information on every possible subject abounds.

Developments in telecommunications and computers are revolutionizing agricultural research. New information technology has the potential to improve the quality of agricultural research, the efficiency of its management, and the relevance and timeliness of its results. Scientists and managers now have access to more information than ever before. At the same time, they can disseminate information to users more easily. Full-text retrieval and multimedia applications are already commonplace. The impact of such new technologies on many NARS is still slight, but growing.



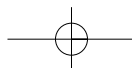
There are two methods for acquiring professional information: interactive and non-interactive. Non-interactive sources include professional journals, books, and information obtained from the airwaves. These provide information but not interactive processes – i.e. the reader or listener cannot talk back to them. Interactive sources of professional information include friends, professionals, community radio, open-line TV programmes, computer chat rooms, and e-mail listserv systems.

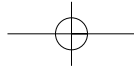
Interactive and non-interactive communication tools contribute to the individual's base of information and serve as part of his or her individual professional network. Interactive sources of information also serve as tools for contributing to the networks of others by distributing known or new knowledge acquired through professional networks. There is a need to encourage and support individual professional networks, as well as the more formal connections with established institutions.

#### **Information systems and technologies**

New information technologies pave the way in rural areas. They assist in establishing information systems, provide better access to market information, and help to computerize bookkeeping.

Lithuania recommends that new information technologies be advanced into rural areas. At the time of the study (2002), most rural inhabitants did not have access to or know how to use modern information technologies. In fact, only 1 percent of urban inhabitants in Lithuania make use of Internet services. Although most rural schools are equipped with computers, these are only utilized in the educational process and are only just beginning to be used to serve other social demands, such as adult and continuing education. However, it is expected that e-publishing will be started in the near future, and e-sites containing special information will be created. A special Internet Web site, "The Master Fair", has already been developed and is expected to bring in sales of agricultural and food products. At the time of the Lithuanian study, some 121 Lithuanian companies had registered on this Web site.





## 5. GUIDELINES FOR STRENGTHENING AKIS/RD

The world is largely ruled by ideas. Ideas are approved or rejected because they are held to be good or bad. Ideas are not a mere intellectual conception, but contain the dynamic power to move individuals and nations. Institutions and entire societies can be changed by certain ideas. AKIS/RD is one of these transformative ideas because it promises to improve the ways in which agricultural knowledge and information are generated, exchanged and utilized, thereby catalysing the emergence and diffusion of ideas that transform rural livelihoods. Even more important is the fact that it proposes an improved and more profitable relationship among the institutions, the different for-profit and not-for-profit organizations, the sector producers and other stakeholders engaged in agricultural development.

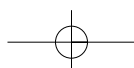
The idea of AKIS/RD is the first step toward its development. The importance of AKIS/RD for the agriculture sector and the socio-economic system as a whole needs to be understood. The AKIS/RD idea of viewing how the main actors (agricultural educators, extensionists, researchers, the private sector and farmers) interact with each other and how they could complement one another needs to be understood and promoted. The most viable way of doing this is through accepting AKIS/RD as central to the context and philosophical foundation of agricultural policy and plans. A new impetus to promote linkages, technology transfer, knowledge sharing and the exchange of relevant information is sorely needed.

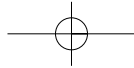
Five broad priority areas, as presented in this study, condition the development of AKIS/RD. The findings of the ten country case studies reviewed in the study suggest a number of guidelines that are applicable to all the countries concerned with improving the operations and efficacy of their agricultural research, education and extension systems and with advancing those systems towards more effective and efficient – because integrated – AKIS/RD.

### **POLICY ENVIRONMENT**

#### **Formulate a national AKIS policy, plan or formal agreement**

Government's formulation of a policy, plan or formal agreement for implementing AKIS/RD is the first and necessary, but not sufficient, step in developing more effective use of a country's public sector agricultural research, extension and education institutions; promoting their alliance with the private sector; and fostering the active and meaningful participation of rural agricultural producers. Once such a plan has been formulated, government must ensure that there is interministerial support for AKIS/RD through central planning and the treasury. Political commitment is even more important than a formulated policy, as noted in the cases of Chile, Cuba and Lithuania.





### **Direct AKIS policy towards public goods issues**

Only government – national, state (provincial/district/governorate) and municipal – can assume the responsibility for ensuring that research and extension services deliver needed public goods. Public policy should seek to deliver those services that are necessary to maximizing public welfare, especially those that the private sector cannot or will not deliver on its own. Only governments are well placed to promote increased institutional pluralism in extension service provision and to oversee the quality enhancement and assurance necessary for rural development.

### **Assess the economic efficiency of the agriculture sector, given AKIS**

Government investments must be maximized. Therefore it is imperative that sustainable economic impact prevails in the agriculture sector and that government and other investments are made in the most cost-effective ways to foster AKIS/RD. Given the present lack of attention to the issue of economic efficiency and the incipience of the idea and practice of AKIS/RD, long-term economic studies need to be initiated.

## **INSTITUTIONAL STRUCTURE FOR SUPPORTING INNOVATION**

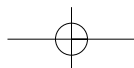
### **Establish AKIS/RD units**

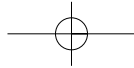
AKIS/RD units are needed for purposes of oversight, coordination and accountability. The establishment of AKIS/RD units will depend on how government thinks it can best coordinate its research, extension and agricultural education activities and align them strategically in order to accomplish common goals. For example, each subsystem of the public sector agricultural institutions might have an AKIS/RD unit aimed at overseeing and reporting on coordination in its own institution in relation to other public sector agricultural institutions, as well as tracking developments towards similar goals among relevant private sector organizations. In another scenario, an AKIS/RD unit external to the relevant institutions and organizations might be established for the oversight and evaluation of accomplishments throughout the agricultural knowledge systems – both public and private. Decisions about establishing AKIS/RD units will depend at least in part on whether countries are at the stage of catching-up, falling behind or forging ahead with support of their knowledge systems.

AKIS/RD require recognizable authority that is responsible for promoting and enforcing the policy mandate. A responsible authority at the national level in the form of an oversight AKIS/RD unit is certainly needed to oversee the development and results of AKIS institutions. Such a unit should be dedicated to creating and facilitating linkages among research, education and extension institutions, as well as with private sector entities and agricultural producers and their organizations. These units should continually review, examine and report on the efforts of the AKIS institutional structures, the conditions for expressing demand for agricultural innovation, the advancement of partnerships and networks, and the financing of AKIS/RD for agricultural innovation and rural development.

### **Institute central and branch supervision of AKIS activities**

A multidisciplinary oversight agency, or each agency individually, at the central and provincial (state, governorate, regional) levels needs to be responsible for supervising AKIS/RD activities and ascertaining the extent to which they are operating collaboratively with other relevant agencies, sectors and producers. This requires strong leadership and good management: poor leadership is a serious problem. Organizations work the way they do because of the way the people in them work, which is often a reflection of their leadership (Heaver, 1982). People expect leaders to show





personal commitment to the organization's vision and to provide conceptual clarification regarding the direction of the organization – where are we going and why? To be truly effective, leadership involves all leaders: not only *executive leaders*, but also *networkers* (front-line workers, in-house consultants, trainers and professional staff who spread ideas throughout and outside the organization) and *local line leaders* (branch managers, project team leaders and other front-line performers). Each has an essential role in advancing AKIS/RD.

#### **Take initiatives to build AKIS institutional capacity**

Human resource development (HRD) is key to the present and future success of AKIS/RD. People, their skills and motivation make the difference in an institution's performance. Each agency must take the initiative to train and upgrade continually its leaders and administrative and field staff in best management practices and new agricultural technologies. The development and maintenance of core capacities for AKIS/RD has been a challenge in many small countries, owing largely to instable funding. With present constraints on government budgets and new financing mechanisms that rely on client financing and competitive funding schemes for discrete project activities, the challenge to sustain core capacity is likely to increase.

#### **Decentralize decision-making to lower levels of government and relevant local organizations, while training people at these levels in the processes of management and administration**

Of the various processes of decentralization (including but not limited to deconcentration of central government authority to branch offices and centres, devolution to sub-governments, and delegation to other, usually private, entities), the international community especially advocates subsidiarity, i.e. decentralization to communities and local organizations.

Development is increasingly viewed as a process in which people learn to participate constructively in solving their own problems. Subsidiarity suggests bringing local people into the decision-making process, but more than that it also implies preparing people to take meaningful development decisions – and some of these people have perhaps never had the responsibility or developed the skills for managing and administering programmes. For decentralization to succeed and be effective and efficient, government needs to promote local-level training in processes such as bookkeeping, accounting, planning, M&E and impact assessment.

#### **Augment the functional performance of AKIS entities**

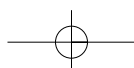
The functional performance of AKIS institutions is central to developing an AKIS/RD based on joint planning and a plurality of partners agreeing to undertake common goals for agricultural and rural development. In line with rational policies for AKIS/RD, the AKIS institutions involved need to review and improve their performance, with specific targeted goals to be met both within the framework of their functional goals and in cooperation with other agricultural agencies, sectors and stakeholders.

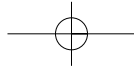
#### **Institute systems for monitoring, evaluation and impact assessment**

Determining the impact of soft systems<sup>11</sup> (discussed in Section 2), such as agricultural research, extension and education, is already difficult, but it becomes even more complex

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<sup>11</sup> A soft system is a social construct that does not physically exist but that is nevertheless a relevant concept when studying social phenomenon such as research, knowledge or innovation systems.





when considering a large, soft system such as AKIS/RD. M&E of each system and of their combined efforts is required, along with periodic impact assessment. While each organization will carry out its own M&E, the overall monitoring, evaluation and impact assessment of AKIS/RD is likely to be the ultimate responsibility of AKIS/RD units in one or more government ministries. These units can collect, analyse and disseminate composite information on the progress of each institution involved in AKIS/RD performance, the conditions supporting or hindering the system, the effectiveness of its partnerships, the usefulness of its networks, and its financial realities.

### **Ensure coordination and joint planning among AKIS institutions**

Planning should be a formal activity involving all interested stakeholders at the various levels of government and society. It should involve a clear vision for agricultural and rural development, ensure minimum conditions for success, define the situation to be developed, define the actors and their responsibilities, ensure training and participatory planning at the government, private sector and community levels, facilitate the allocation of funds to the community level, and evaluate with an eye to scaling up successful projects from the local to the regional and national levels.

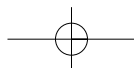
Coordination needs to take place both formally and informally. The structure and management of linkages between agricultural research and different agricultural extension systems may have a significant affect on those systems' relative success or failure in achieving their objectives. Agricultural extension can be characterized as falling into four categories of linkage structures with agricultural research. Research and extension can be: 1) housed together; 2) administratively integrated; 3) coordinated through a council; or 4) part of integrated on farm research and extension. The best example of research and extension being housed together is the university-based, United States Cooperative Extension System. Two major types of extension systems appear to be administratively integrated with research: commodity-focused systems, and most conventional developing country systems. Research and extension in Taiwan, Province of China, and in several other countries is coordinated through research review councils. Farming Systems Research and Extension (FSR/E) and On-Farm, Client-Oriented Research (OFCOR) can be defined as being systems of integrated on-farm research and extension (Wheeler, 1990).

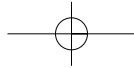
## **CONDITIONS FOR EXPRESSING DEMAND FOR INNOVATION**

### **Promote demand-driven orientation in public programmes**

In principle, AKIS/RD should be producer-oriented and demand-driven. Future investments in agricultural research, education, extension and training must emphasize the development of clients' capacity to organize and express their demand for services, increase their influence over or active participation in programmes, and enhance their ability to finance services. Such investments can be a springboard for introducing inclusive participatory approaches, accountability mechanisms and self-governing producer organizations.

Government boards or other oversight entities, involving directors of AKIS/RD units, should pay keen attention to whether agricultural producers and their organizations are involved in programme decision-making. It is common sense to include producers in the development of programmes for their betterment.





### **Invest in agricultural market development**

To promote agricultural development as an aspect of rural development, government needs to facilitate the development of efficient, competitive agricultural markets, thereby providing an avenue for buying and selling produce. Market development, bolstered by concomitant financial support for physical infrastructure, is an essential step towards improving agriculture in the rural sector.

### **Improve the availability of and access to agricultural inputs**

Agricultural credit and supplies are the lifeblood of farming enterprises. Both need to be available and timely if agricultural producers are to meet the needs of their farming systems. However, this is not to suggest that credit be subsidized or that non-price credit arrangements be allowed to develop. When policy-makers turn to non-price kinds of rationing, personal influence tends to determine who receives credit. This means that recipients are likely to be the large rather than the small producers (Schuh, 1987). Technically, competitive supply systems should result in inputs such as fertilizers and pesticides being delivered in ways and packaged in containers that suit the needs and resources of the small farmer.

### **Invest in rural physical infrastructure**

Investment in rural physical infrastructure – roads (including feeder roads), clean water and sewage systems, electricity, telecommunications, etc. – is necessary to make rural areas attractive and safe, and provides the *sine qua non* of rural development. Rural infrastructure tends to be underdeveloped. Long-term agricultural and rural development strategies must aim to transform education, research and information institutions into an effective AKIS/RD.

### **Mandate joint planning among AKIS agencies**

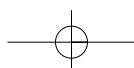
Joint planning is an important means of promoting cooperation, coordination and collaboration among AKIS/RD institutions, and is a necessary step towards creating effective linkages. A high-level government council or board should be established at the national and regional levels, involving both institutional officials and representatives of producers and producers' organizations in order to ensure that a mandate for joint planning is not only implemented but also effectively pursued.

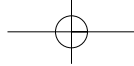
### **Invest in the education and training of agricultural producers to enable them to demand services effectively**

As agriculture undergoes rapid change, the farming and rural populations that provide seasonal labour for agriculture need new and additional training and retraining to cope with modern technologies and change. This guideline adheres to the notion of bottom-up because the human skills development of agricultural producers is a significant key to advancing technologies in agriculture and to providing the knowledge needed to create profitable small farm enterprise.

### **Promote gender equality and vulnerable groups' access to services**

Women (in particular) need to be recognized and reimbursed for their contributions to agricultural and rural development, which should be calculated in all statistics relating to agricultural operations. While there is an increasing understanding and appreciation of the roles, rights and responsibilities of both men and women in agricultural production, and of the greater constraints faced by women, there is still much to be done to promote gender equality.





## **PARTNERSHIPS AND NETWORKS**

### **Design structures for effective institutional cooperation**

There are no perfect designs for creating effective institutional cooperation, especially between the public and private sectors. In addition to a national AKIS/RD oversight unit with regional branches, also needed are rural development boards or councils that include public and private sector participants. These can be valuable in coordinating government and non-governmental institutions involved in AKIS/RD.

### **Promote public–private partnerships (and institutional pluralism)**

Institutional pluralism is an advantage to most countries for various reasons. A strong private sector can assume responsibilities previously shouldered by government, such as post-harvest storage and the marketing of produce. The private sector can also provide alternative sources of delivery and production services. Public sector programmes should avoid competing with private sector research and extension systems; on the contrary these systems should provide technical support to private providers, develop public–private partnerships for service delivery, share information and coordinate activities with private service providers, and establish financing mechanisms to co-finance some instances of private service delivery, especially to poor farmers.

### **Insist on programme participation by agricultural producers and rural producer organizations**

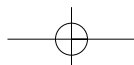
Agricultural producers and rural producer organizations are an important component of institutional pluralism and are central to agricultural development. Research and extension institutions can encourage greater producer participation in the functioning of their activities by: focusing programmes of research and development on the needs of producers or their organizations; introducing participatory diagnostic methods to identify the real needs of producers; decentralizing research and extension institutions closer to producers; establishing consultative fora among researchers, extension agents and producer organizations; and providing incentives to encourage researchers to listen more carefully to producers and their organizations, and to respond promptly to their needs (Rondot and Collion, 2001).

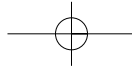
### **Promote effective use of traditional communication technologies**

Traditional communication technologies, such as radio, brochures, audiovisual videotapes, magazines, etc., continue to be important means of networking with agricultural producers. Radio is an especially important means of communication in many rural areas. Some (FAO, 2003c) consider radio "the one to watch" because it is still the most portable communication medium, the most widespread and the most economical.

### **Invest in computer/Internet and other modern technologies**

Computers (and perhaps eventually cell-phones, whose potential is not mentioned in any of the case studies) promise improved means of connecting institutions and agricultural producers to sources of agricultural knowledge and information. People working in development and development communication are increasingly turning to the Internet to improve their knowledge, gain valuable information and update their skills. Unfortunately, the application of these technologies is often very limited in developing countries owing to logistic reasons, low literacy and poor infrastructure.



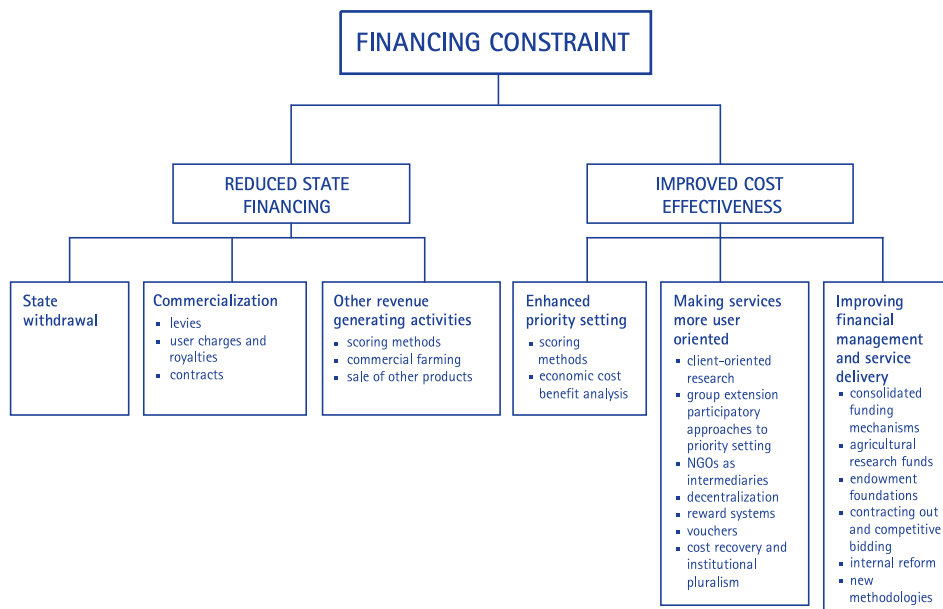


## FINANCING SYSTEMS FOR INNOVATION

### Ensure adequate funding for AKIS/RD

Lack of adequate funding for AKIS institutions tends to be the main complaint and the main constraint mentioned in the case studies. Agriculture and rural development depend on investing in improved quality of life in rural areas and on developing knowledge and information systems. Options for alleviating public sector financial constraints (Beynon., 1998) are illustrated in Figure 5.

**Figure 5**  
**Options for alleviating public sector financial constraints**

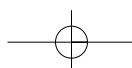


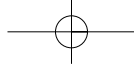
As Figure 5 illustrates, the options for alleviating financial constraints may be classified into two groups: 1) *reducing the scope of state financing* in those areas where the private sector may be willing to participate or beneficiaries may be willing to pay; and 2) *improving cost-effectiveness* of remaining services by enhanced priority setting procedures, by making services more user-oriented and responsive to demand, and by improving both the management of existing resources and the efficiency of service delivery (Beynon, 1998).<sup>12</sup>

### Promote repartition of costs

The "user pays" principle for knowledge and information is generally well accepted, but end-users are not all in agreement about paying for services and training. Repartition of costs will

12. In Figure 5 "State withdrawal" from service provision is when the State shifts responsibility to the private sector. "Scoring methods" are used to improve priority setting, and typically involve multiplying the value of production of individual commodities. An analytical and comparative review of ten country case studies on AKIS/RD

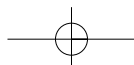
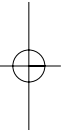
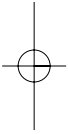


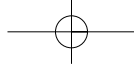


presumably take time, as many rural people have not seen effective AKIS/RD services for which they would be willing to pay. The increased commercialization of agriculture, and pressures to maximize competitive advantage are likely to force profitable producers to change in this regard. However, other producers may simply be unable to pay for services because they live on the edge of subsistence. Experience shows that they too will pay for effective services in some cases, but continued subsidies and government support will probably be necessary. Commodity-based repartition of costs can often profitably involve a cess on marketed products. In some cases payment in kind may replace cash payment for services.

#### **Explore various types of investments to develop stakeholder capacities**

Government investments are needed to improve users' access and help them to express their demand for innovation services. A prime example is funding to strengthen RPOs. Competitive grants from donors are valuable for catalysing AKIS programmes, as evidenced by the World Bank Eastern Europe and Central Asia Grants Programme (2003). Contracting with the private sector for service provision may be more effective and efficient than public sector delivery of services. Community demand-driven funds can open up opportunities for AKIS systems to strengthen stakeholder involvement and control over programmes and to enhance effectiveness in the use of funds. Improving the overall performance of the agriculture sector and its contribution to rural development will necessitate fundamental reforms in national AKIS. These reforms require various types of investments to develop stakeholder capacities.





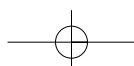
## 6. CONCLUSION: FROM IDEA INTO ACTION

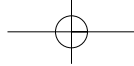
The AKIS/RD concept needs to be understood because it is very important to agricultural and rural development and, more generally, to national economies. The first task is to promulgate throughout the agricultural knowledge triangle of (sub)systems the idea that the main actors (agricultural educators, extensionists, researchers, the private sector, and farmers) can interact with each other for their mutual benefit. In short, the concept of AKIS/RD needs to be understood, nurtured and expounded.

Given an AKIS/RD policy, the next step is to plan strategically the best direction and approaches for developing an integrated AKIS/RD. Recognizing the value and importance of the idea of AKIS/RD, agricultural institutions need to promote linkages, technology transfer, knowledge sharing and the exchange of relevant information. This impetus must be supported by adequate financial commitment. However, as the case studies point out, there are various funding sources other than the State. For example, funds for AKIS/RD may be acquired from the local communities that benefit from agricultural knowledge and information, from public and semi-public corporations, from private estate farms and trade organizations, from sundry cess arrangements for exportable goods, and from RPOs and individual producers. Research, extension and education must stop competing with each other for limited government resources and must begin to strengthen linkage mechanisms that will improve the flow of technology to agricultural producers.

Government also needs to create the conditions necessary for developing AKIS/RD. Investment in market development and support to input providers, especially credit and supply institutions, are needed to stimulate the agricultural community, and attention to the rural physical infrastructure is needed to make the environment attractive and safe. Agricultural producers, especially women and poor farmers, require education and training to bring them into the modern world of labour-saving technologies and more productive practices. Joint planning between producers and institutional operators can provide the platform for advancing a demand-driven system of technological innovation for agricultural development.

System leaders and managers need a better understanding of the dynamic nature of both national and international technology systems, and should be able to identify those areas where the public system has a comparative advantage over private sector R&D firms. First, the publicly funded technology system needs to focus more attention on those sustainable development activities that will maintain the natural resource base of each nation – R&D activities that are not likely to be undertaken by the private sector. The public sector also needs to give greater attention to intensifying and diversifying the farming systems of small-scale farmers, both to increase the productivity and incomes of these farm households and to slow rural-urban migration. In addition,





public research and extension systems must develop more active partnerships with farmers' organizations, private sector firms and NGOs so that technology assessment and transfer can be undertaken in a coordinated and effective manner, with each institution concentrating on those activities where it has a comparative advantage, while jointly planning activities where the goal requires concerted action.

The development of AKIS/RD is attractive to the private sector. Major roads that link towns will almost certainly have to be built, or at least funded, by government. The benefits from roads will be widely spread and accrue as much to the public as to the private sector regarding access to clientele, or potential clientele. In the short and – especially – the long terms, private sector issues of distribution and dynamic efficiency promise to be enhanced as a result of government commitment to AKIS/RD.

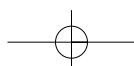
As a consequence, partnerships for effective institutional cooperation with the private sector and producers need to be combined with the effective use of communication, both traditional and modern technologies. Computer technology, online and interactive mechanisms have a huge potential to develop the system. Investments are needed to support the enabling of the private sector and, in particular, the encouragement of RPOs. The commodification of agricultural knowledge has gradually become a reality, and this means that producers must begin to recognize the value of information and to share in paying for it, just as farmers are beginning to accept that water carries a cost.

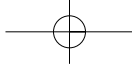
Key to understanding and strengthening an AKIS/RD is recognition of the limitations of a top-down "technology transfer" approach to rural innovation. Public sector policy-makers and managers need rather to focus on the diverse uptake pathways for innovation, client education and information delivery, and facilitating local innovation. Technology transfer will remain important, but is unlikely to be sufficient to stimulate the sustainable transformation of rural livelihoods. Two-way, interactive, participatory models of AKIS/RD are crucial for the involvement of producers and other stakeholders in the AKIS process. Effective links between information providers and user communities cannot be adequately established unless there is continuing communication and shared decision-making within the system.

Ultimately, the adoption of AKIS/RD as a nationwide concept and general practice depends on each government's interest and determination to foster agricultural knowledge and information for the contribution it can make to growth and equity in the rural sector. Long-range political support, strong leadership and adequate investment are crucial to its success.

The case studies provide a wealth of data on what governments and their institutional leaders are doing to move towards integrated AKIS/RD. In some cases, the reforms are deliberately based on an understanding of the principles underlying an AKIS/RD. In others, they are the result of reaction to crises. Global trends and the failure of top-down programmes are forcing countries to confront the problems and promise of developing effective, integrated AKIS/RD.

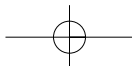
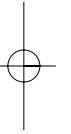
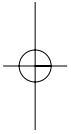
The studies bring into sharp relief the instruments and commitment needed to realize AKIS/RD. They underline the importance of AKIS/RD and AKIS/RD-related policy, revitalized institutional arrangements, advanced system and programme management, the necessary conditions for supporting innovations, the partnerships and networks that contribute to concerted agricultural

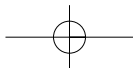
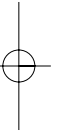
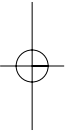
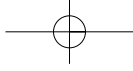




development efforts, and the "bottom-line" importance of sustainable funding. They stress the integration necessary to make AKIS/RD successful. They also suggest the value and importance of agricultural knowledge and information in the promotion of innovation that contributes to a nation's economic and social development. They highlight that an integrated AKIS/RD requires the strategic alignment of AKIS institutions, in cooperation with relevant private sector organizations, and the participation of the rural sector's agricultural producers and other stakeholders with the shared aim of developing the agriculture sector and, thereby, advancing rural development.

Investing in agriculture and its knowledge institutions is a long-term proposition, but few developing countries will reduce poverty significantly if they ignore it. In fact, few if any countries will achieve the Millennium Development Goals without growth in their agriculture sectors. Some 70 percent of the world's poor live in rural areas and rely on agriculture for their livelihood, either directly or indirectly. Accordingly, FAO and the World Bank have made agricultural growth and poverty reduction a central pillar of their rural strategy – FAO with its Special Programme for Food Security and the World Bank with its Reaching the Poor Programme. Both organizations are committed to promoting the idea and practice of AKIS/RD. In general, the case studies underscore that the idea is being transformed into action, albeit at different stages of development.





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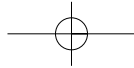
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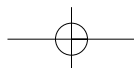
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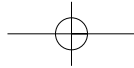
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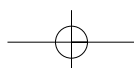


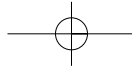
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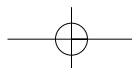


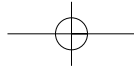
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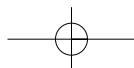
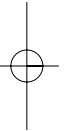
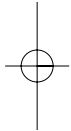


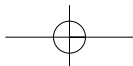
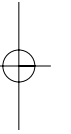
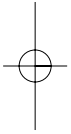
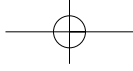
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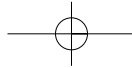




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# ANNEX 1

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## Terms of reference for consultant to prepare an analytical and comparative view document based on the country case studies

### INTRODUCTION

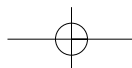
The Extension, Education and Communication Service (SDRE) and the Research and Technology Development Service (SDRR) of the Research, Extension and Training Division, Sustainable Development Department at FAO headquarters are interested in having the country case studies on Agricultural Knowledge and Information Systems for Rural Development (AKIS/RD) analysed and synthesized. These studies were recently conducted in a number of countries in different geographical regions of the world.

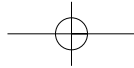
### AKIS/RD

An AKIS/RD links people and institutions to promote mutual learning and generate, share and utilize agriculture-related technology, knowledge and information. The system integrates farmers, agricultural educators, researchers and extension workers to harness knowledge and information from various sources for better farming and improved livelihoods. A detailed description of the AKIS/RD system is contained in a FAO/World Bank publication *Agricultural Knowledge and Information Systems for Rural Development (AKIS/RD): Strategic vision and guiding principles* (2000).

In summary, AKIS/RD place strategic emphasis on the following:

- AKIS/RD systems that are financially, socially and technically sustainable;
- relevant and effective processes of knowledge and technology generation, sharing and uptake;
- AKIS/RD systems that are demand-driven through empowerment of farmers such that programmes and activities are responsive to their needs;
- the interface between and integration among the various education, research, extension and farming activities; and
- accountability to assure that stakeholders assume their respective responsibilities.





### Country case studies

With the aim of preparing operational guidelines for translating into action the strategic vision and guiding principles highlighted in the joint FAO/World Bank publication mentioned above, SDRE/SDRR initiated/conducted case studies in the following countries:

1. Malaysia
2. Pakistan
3. Uganda
4. Lithuania
5. Cameroon
6. Morocco
7. Chile
8. Cuba
9. Trinidad and Tobago
10. Egypt

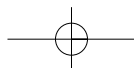
The objectives of the case studies were to examine the status of the AKIS/RD system in terms of its membership pattern, resource allocation, operations, strengths and weaknesses, and to learn lessons from the case studies in order to strengthen the AKIS/RD effectively in the countries of the studies and elsewhere.

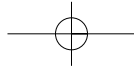
The case study methodology involved a combination of approaches including document and secondary data review, rapid appraisals, questionnaires, group and individual interviews with key informants and workshops/seminars. To the extent possible, both quantitative and qualitative data were utilized in the studies. The national consultants who conducted the studies to obtain technical information required for preparing the study reports performed the following specific tasks:

identification of the major AKIS/RD operators, both public and private, in the country in the areas of agricultural research, agricultural extension, agricultural education and the farming profession;

recording the perceptions of the identified operators about their roles in the AKIS/RD system;

- identification of the current formal and informal mechanisms that link various operators for the purpose of joint planning and integrated operations within the context of AKIS/RD, and assessment of their suitability and effectiveness;
- collection of information on the human, physical and – especially – financial resources of various operators and the technical and geographical scope of their individual operations, and identification of any current or planned modalities for sharing resources, especially aimed at cost-sharing;
- assessment of the importance that the government attaches to each operator in terms of budgetary allocations, staff benefits (incentives), and promotion and career development opportunities (enabling environment);
- identification of the main constraints such as institutional, physical, political, financial, human resources, etc. that discourage various operators from planning and operating jointly;
- collection of the views and suggestions of various operators for facilitating joint planning and operations;





- analysis of the current programmes of various operators and identification of the programme areas where they can collaborate with the aim of implementing the AKIS/RD concept effectively rather than operating in isolation from one another;
- assessment of the extent of decentralization, delegation of power and authority for financial control of income and expenditure to lower administrative levels, such as the district level, in the cases of the various operators;
- identification of cases where the operators use in their field operations client-oriented and participatory approaches to planning, programming and implementation, involving several operators;
- assessment of the importance attached by various operators to human resources development, such as through development of problem solving skills, participatory learning and empowerment, as compared with a mainly technology and production focus;
- critical assessment of any appropriate mechanisms for monitoring, evaluation and impact assessment of their respective programmes used by various actors.

In addition to the FAO/World Bank publication on AKIS/RD, the following information on major discipline-specific issues, trends and considerations was provided to each consultant responsible for conducting a study:

*Agricultural extension:* broader role beyond mere agricultural technology transfer, stakeholders' participation, decentralization, privatization, pluralism, client focus, gender sensitivity, application of electronic information technology, etc.

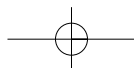
*Agricultural research:* research policy environment and management style; participatory and gender-sensitive research agenda; research coordination, priority setting and M&E; decentralization and resource allocation; research partnerships, linkages and outreach.

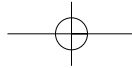
*Agricultural education:* systemic approach (i.e. looking at basic, vocational and higher education in the context of rural development systems); curriculum renewal and relevance (including gender, environment, biotechnology, food safety and rural development issues); pedagogical innovation (i.e. using more participatory and experiential teaching methods, and giving opportunity for practical experience and skill building); equity of access to quality education.

*Farming practice:* indigenous knowledge, farmer organizations, farmer empowerment, and participation in the making of decisions related to agricultural extension, research and education that affect farmers' lives.

#### **Analysis and synthesis of the studies**

The objectives of analysing and synthesizing the country studies are: 1) to identify major hurdles to smooth functioning that are faced individually by any one AKIS/RD partner institution and/or by all the partner institutions, any good practices being followed by any AKIS partner/s in any country, which could be tried in other countries; and, based on the lessons learned from the case

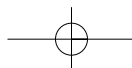


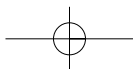


studies, 2) to come up with normative guidelines that developing countries could follow for the satisfactory functioning of AKIS/RD, and that could also be used for formulating projects aimed at AKIS/RD strengthening.

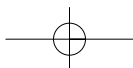
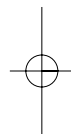
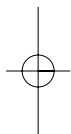
A consultant who has working knowledge of English, Spanish and French, is familiar with the AKIS/RD concept, has the necessary training and at least ten years of senior-level experience in an international setting in agricultural extension, research and education, and has a basic degree in agriculture and preferably a Ph.D. in one of these fields will be contracted to do the analysis and synthesis of the country studies and prepare a comprehensive report on the subject. Working under the direct technical supervision of the Senior Officer for Agricultural Training and Extension, SDRE (M. Kalim Qamar) and the Senior Research Officer, SDRR (Henry Mwandemere), the consultant will perform the following specific tasks:

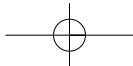
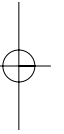
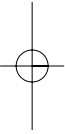
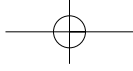
- prepare a tentative framework for analysing and synthesizing the country case studies, which may be used to extract, analyse, synthesize and use the information in executing the following remaining terms of reference;
- critically review the ten country case study reports on AKIS/RD, starting with the reports that are immediately available, followed by the remaining study reports as soon as they are completed;
- identify the main commonalities among AKIS/RD in all the study countries in terms of organizations and institutions involved, organizational mandate, methods of operation, institutional linkages, extent of human and physical resources, types of clientele served, etc.;
- identify any unique, innovative steps undertaken in any country/countries to strengthen AKIS/RD that seem promising and may be tried elsewhere;
- identify the areas of strengths and the reasons for those strengths, along with the weaknesses and the causes of those weaknesses, that distinctly emerge in most of the case studies;
- identify the recommendations most frequently given in the country study reports that are aimed at strengthening specific weak areas, and assess whether those recommendations are sufficient to establish a sustained, efficient and productive AKIS/RD;
- based on the review, analysis and synthesis of the studies, formulate normative guidelines that developing countries can use for establishing effective AKIS/RD;
- identify and select any unusual, unique and eye-catching content from the text of the various studies, which may be used for preparing "boxes" to be inserted in the text of the final analysis and synthesis report;
- prepare a report in English on the work done, with the following contents:
  - Executive summary.





- Introduction/Background.
- Main conclusions of each country study.
- Unique, innovative features in various country studies.
- Common strengths related to AKIS/RD as revealed by the country studies, and reasons for these.
- Common weaknesses related to AKIS/RD as revealed by the country studies, and reasons for these.
- Recommendations most frequently made for strengthening AKIS/RD in various country studies.
- Normative guidelines for strengthening AKIS/RD.
- At least two project profiles aimed at strengthening AKIS/RD, based on the normative guidelines, containing rationale, objective, outputs and the human, physical, and financial resources needed to achieve the outputs, as well as the estimated time required. (This has not yet been done).
- Conclusion.
- Annexes, etc.





# ANNEX 2

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## Sample terms of reference for National Consultant – Cameroon

Under the overall supervision of the Chiefs of SDRE and SDRR, with the direct supervision of the designated SDRR Research and Technology and SDRE Extension, Education and Communication Officers, and in collaboration with other FAO officers as required, the consultant will carry out the tasks described below in order to prepare a case study document on AKIS/RD in Cameroon.

### Background

FAO and the World Bank recently prepared a publication on AKIS/RD that sets out a strategic vision and guiding principles. A remaining task is the preparation of operational guidelines. To this end, FAO is conducting case studies in various regions. Cameroon has been selected as the AKIS/RD case study in West and Central Africa. The objective of the case study is to collect lessons learned through efforts to operationalize and implement AKIS/RD systems.

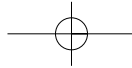
An AKIS/RD links people and institutions to promote mutual learning and to generate, share and utilize agriculture-related technology, knowledge and information. The system integrates farmers, agricultural educators, researchers and extensionists to harness knowledge and information from various sources for better farming and improved livelihoods. A detailed description of the AKIS/RD system is contained in the FAO/World Bank publication, which will be provided to the consultant along with other relevant documents.

To summarize, AKIS/RD places strategic emphasis on the following:

- AKIS/RD systems that are financially, socially and technically sustainable;
- relevant and effective processes of knowledge and technology generation, sharing and uptake;
- AKIS/RD systems that are demand-driven through empowerment of farmers such that programmes and activities are responsive to their needs;
- the interface between and integration among the various education, research, extension and farming activities at different levels (central, regional, local); and
- accountability to assure that stakeholders assume their respective responsibilities.

### Case study methodology

The case study methodology (research focus) should involve a combination of several approaches including document and secondary data review, rapid appraisals, questionnaires, group and individual interviews with key informants and workshops/seminars. To the extent possible, both



quantitative and qualitative data should be utilized in the study. The consultant will be expected to present a brief description of the research strategy that will be utilized, including a list of the institutions and organizations that will form part of the study.

The consultant should involve representatives from the following institutions, among others: The Institute of Research and Agricultural Development (IRAD), the Ministry of Agriculture (MINAGRI), The Ministry in charge of Livestock, Animal Production and Industries (MINEPIA), the Ministry of Environment and Forestry (MINEF), the Support Project to the National Agricultural Extension and Research Programme (PNVRA), donor agencies supporting AKIS/RD programmes and projects (ADB, IFAD, World Bank, among others), the University of Dschang, NGOs and farming groups and organizations.

In general terms, the case study should address the following questions: 1) Who are the actors in the AKIS/RD system? 2) How do the different actors perceive their roles in the AKIS/RD system? 3) What institutional or technical arrangements are in place to facilitate/ensure the integration of AKIS/RD components? 4) How effective and efficient are the present linkages/arrangements? 5) What are the modalities for sharing responsibilities and resources? and 6) Is there any evidence of AKIS/RD impact, especially at the farmer level?

The case study also should draw on the principles listed below in order to identify lessons learned as well as constraints. It should be recognized that some of these principles may be intended objectives of the AKIS/RD system and some may be only partially implemented, while others are planned for future implementation through AKIS/RD programmes and projects. Also, some may not be considered at all in the AKIS/RD system, indicating a potential "gap" or weakness.

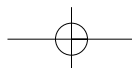
*Economic efficiency.* Are the benefits of AKIS/RD programmes commensurate with the costs, and are programmes/projects tailored to a scale that is commensurate with, and justified by, expected outcomes?

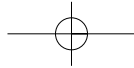
*Match between comparative advantages of AKIS/RD organizations and the functions they perform.* Is the rationale for all organizations involved clearly stated and in accordance with the concepts for public and private sector AKIS/RD roles? For example, is the public sector's involvement in AKIS/RD programmes/projects focused on "core" public good functions?

*Subsidiarity.* Are operational authority and responsibilities for AKIS/RD programmes allocated based on the principle of "subsidiarity", i.e. decision-making devolves to the lowest possible level of government consistent with organizational competencies and efficient use of funds?

*Clear repartition of costs.* Do the main stakeholders in AKIS/RD programmes/projects share the burden of funding AKIS/RD activities based on agreed criteria, including their ability to pay and their use of services?

*Careful assessment and optimal mixing of funding and delivery mechanisms.* Which AKIS/RD programmes are funded and delivered by central and local governments, and which AKIS/RD services and products are contracted to outside sources such as private firms, NGOs and farmer associations?





*Pluralistic and participatory approaches.* Are various approaches to service delivery used, and are a range of stakeholders and organizations with different strengths utilized?

*Effective linkages among farmers, educators, researchers, extensionists and other AKIS/RD stakeholders.* Are AKIS/RD programmes and institutions explicitly designed to create synergies and collaboration among stakeholders in all AKIS/RD domains (i.e. research, extension, education, farmers)?

*Building human and social resources.* Do AKIS/RD programmes provide resources and incentives for educating staff, e.g. to empower rural clients, to operate in rearranged public/private responsibilities, to use new information and communication technologies, and to apply concepts for participatory learning and problem solving?

*Sound M&E.* Are AKIS/RD programmes results-oriented with procedures for monitoring progress towards achieving goals and for evaluating outcomes?

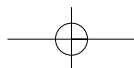
### **Expected output**

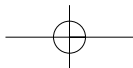
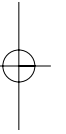
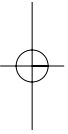
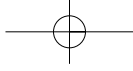
The final output will be a case study document prepared in English or French in electronic format and hard copy, approximately 75 double-spaced pages in length. The consultant will first provide an outline of the document to the responsible FAO officer for clearance. A first draft of the document will be reviewed by FAO officers and returned to the consultant to incorporate changes as necessary. The working title of the document will be *Best practices and lessons learned from AKIS/RD in Cameroon* (or its equivalent in French). The following timetable will be followed in order to produce the case study document in a timely fashion:

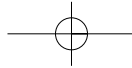
- Contract with Consultant signed by 15 November 2001.
- Research strategy and document outline submitted to FAO by 30 November 2001.
- First draft submitted by 1 January 2002.
- Comments from supervising officers by 15 January 2002.
- Changes incorporated by 31 January 2002 and draft resubmitted to FAO.

### **Qualifications**

The consultant should be thoroughly familiar with the concepts, principles and practical applications of AKIS/RD in the context of Cameroon. He/she should have at least ten years of work experience in Cameroon in aspects of AKIS/RD implementation (research focus). The consultant should hold a higher degree in agriculture or a closely related discipline. The consultant should have excellent writing skills in English or French and in the use of computers for word processing.







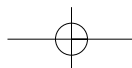
# ANNEX 3

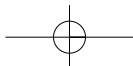
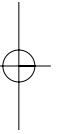
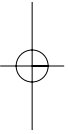
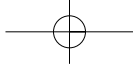
## Country Case Study Worksheet

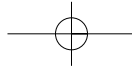
<b>1. POLICY environment</b>	
1.a Title of the national AKIS policy, plan or formal agreement	
1.b Public goods targeted by AKIS policy	
1.c Indication of economic efficiency of agriculture sector, given AKIS	
<b>2. INSTITUTIONAL structure for support of innovation</b>	
2.a Name/number of public sector AKIS/RD units	
2.b Who responsible for central and branch supervision	
2.c What initiatives taken to build AKIS institutional resources (leadership/staff <i>HRD</i> )	
2.d What type/level of programme <i>decentralization/</i> subsidiarity	
2.e Who responsible for <i>M&amp;E</i> and impact assessment	
2.f Indication of functional <i>performance</i> of AKIS entities	
<b>3. CONDITIONS for expression of demand for innovation</b>	
3.a Evidence of demand-driven orientation in public programmes	
3.b Investment in agricultural market development	
3.c Availability/access to input supplies (credit, supplies)	
3.d Adequate physical infrastructure	
3.e Joint planning between which agencies/how <i>effective</i> are <i>linkages</i> ?	
3.f Agricultural producers <i>HRD</i>	
3.g Indication of gender inclusion	
<b>4. PARTNERSHIPS and NETWORKS</b>	
4.a What structures for effective institutional cooperation	
4.b Example of strong public–private partnerships ( <i>pluralism</i> )	
4.c Evidence of <i>programme participation</i> by APs (and RPOs)	
4.d Example of effective use of traditional communication technology	
4.e Example of effective use of modern computer/ internet technology	
<b>5. FINANCING systems for innovation</b>	
5.a Figures showing adequate funding for AKIS/RD	
5.b Type of <i>repartition of costs</i> (fee-based cost-sharing)	
5.c Type of <i>investments to develop stakeholder capacities</i>	

Text in bold italics indicates the original nine principles of AKIS.

AP = agricultural producer; HRD = human resource development; M&E = monitoring and evaluation; RPO = rural producer organization.





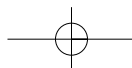


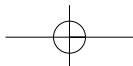
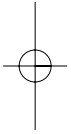
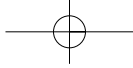
# ANNEX 4

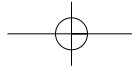
## Worksheet for AKIS rankings

Country	AKIS/RD					
Uganda						
Trinidad and Tobago						
Pakistan						
Morocco						
Malaysia						
Lithuania						
Egypt						
Cuba						
Chile						
Cameron						
	<p><b>AKIS/RD</b></p> <p><b>1. POLICY environment</b>                      1.a Existence of national AKIS policy, plan, formal agreement                      1.b AKIS targets public goods                      1.c Attention to economic efficiency of agriculture sector</p> <p><b>2. INSTITUTIONAL structure for support of innovation</b>                      2.a Existence of public sector AKIS/RD units                      2.b Central and branch supervision                      2.c Initiatives to build AKIS institutional resources (leadership/staff HRD)                      2.d Sound strategy for programme <i>decentralization/subsidiarity</i>                      2.e Systems for M&amp;E and impact assessment                      2.f Functional <i>performance</i> of AKIS entities</p> <p><b>3. CONDITIONS for expression of demand for innovation</b>                      3.a Demand-driven orientation in public programmes                      3.b Agricultural market support                      3.c Input supply (credit, supplies) support                      3.d Physical infrastructure support                      3.e Joint planning/ <i>effective linkages</i>                      3.f HRD for APs                      3.g Gender inclusion</p> <p><b>4. PARTNERSHIPS and NETWORKS</b>                      4.a Structures for effective institutional cooperation                      4.b Existence of strong public-private partnerships (<i>pluralism</i>)                      4.c <i>Programme participation</i> by APs (and RPOs)                      4.d Effective use of traditional communication technology                      4.e Effective use of modern computer/internet technology</p> <p><b>5. FINANCING systems for innovation</b>                      5.a Adequate funding for AKIS/RD                      5.b <i>Repartition of costs</i>                      5.c <i>Investments to develop stakeholder capacities</i></p>					

Text in bold italics indicates the original nine principles of AKIS.  
 AP = agricultural producer; HRD = human resource development; M&E = monitoring and evaluation; RPO = rural producer organization.







# ANNEX 5

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## Country profiles of AKIS/RD

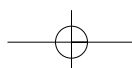
The following country profiles on AKIS/RD are based primarily on the case studies, with occasional interpretation or commentary from related literature. Remembering that the case studies average about 75 pages each, these profiles are to be considered as samples from lengthy and highly detailed documents. They are extremely condensed and intended only as an overview or quick reference for further information relevant to the materials in the main document.

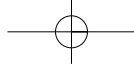
### CAMEROON

Cameroon initiated the National Programme for Agricultural Extension and Training (PNVFA) in 1988 as a pilot plan. In 1998, the second phase of the programme was signed into law, and financing was allocated, along with a name change to National Programme for Agricultural Extension and Research (PNVRA). Although various ministries are involved in the public sector AKIS/RD, the PNVRA is essentially the flagship in Cameroon's AKIS/RD.

Directed towards promoting innovation, the PNVRA espouses six components central to AKIS/RD: 1) agricultural extension; 2) training and development of human resources; 3) support to producer organizations and associations; 4) partnership with the private sector; 5) agricultural research; and 6) village community participatory pilot development operations and M&E of the impact of the extension programme. The PNVRA appears to have had a satisfactory impact, although all of its goals have yet to be realized. A gap still exists between the mass of information accumulated in research centres, universities and other organizations and the degree of utilization of this information.

Cameroon's PNVRA is administered identically in all ten of the country's provinces. All relevant ministries are involved and tend to coordinate their activities both among themselves and with private sector commodity organizations. International NGOs (e.g. Association pour la Promotion des Initiatives Communautaires Africaines, Heifer International, and Helvetas) provide important support to the PNVRA in its efforts to develop a national system of innovation. The programme also receives funds and support from a number of Consultative Group on International Agricultural Research (CGIAR) international agricultural research centres (the International Potato Center [CIP], the International Cooperation Centre of Agricultural Research for Development [CIRAD], etc.). Institutional cooperation reinforces linkages among researchers, extensionists and producers, and increases the impact of innovation on agricultural development. Traditional savings and credit structures exist in different regions of the country – known as "*Tontine*" in the local language of the Northwest Province – and are based on mutual trust. M&E systems operate throughout the PNVRA.





The "Convention de collaboration" (signed by the Minister of Scientific and Technical Research and the Minister of Agriculture on 30 April 1996) and Decision Number 97 (signed 12 November 1997 with the Institute of Agricultural Research and Development – IRAD) established formal collaboration between research and extension. System strategies rely on: a bottom-up approach of testing research results on farmers' fields and giving priority to farmers' needs; a participative approach elaborated and executed in joint programme development; and contractual mechanisms for joint programmes between provincial agricultural delegations and regional IRAD centres. Various AKIS activities and associations in Cameroon receive funds from international and bilateral organizations, e.g. the World Bank, IFAD, ADB and Belgium, as well as from commodity companies.

The Cameroon AKIS/RD thus relies heavily on public sector institutions and initiatives and appears quite dependent on project funding. Reform measures are orienting the system to greater private sector involvement, more participatory approaches and system decentralization, all of which are yet to be fully incorporated into a dynamic pluralistic system.

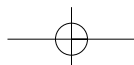
## CHILE

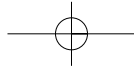
The AKIS/RD in Chile is characterized by great diversity, a high level of development and the complexity of its mechanisms for generating, transferring and diffusing knowledge and information to a multiplicity of stakeholders with diverse – and not necessarily specialized – goals. Chile does not appear to have an explicit AKIS/RD policy, but demonstrates a strong commitment to rural development that fosters AKIS/RD among its agricultural research, education and extension institutions and has a close partnership with the private sector. This commitment to rural development is evidenced by a steady increase in its national and sectoral public allocation for productive growth and for social and physical infrastructure development.

Chile was one of the first countries to enable its private sector to expand its role within the national AKIS/RD. Funding mechanisms employed by Chile include the use of a range of competitive funds and co-financed assistance programmes to support producers and producer groups. However, despite the emphasis on private funding and competitive grants, costs still account for 20 percent of the National Institute of Agricultural Research (INIA) budget.

The quality of extension services is variable and depends in large part on the number of agricultural producers served and the degree of knowledge on the part of the provider in the area being served. Where providers cover more than one region of the country and serve a very large number of producers, the quality of the service tends to be deficient. On the other hand, when the provider concentrates on a reasonable number of producers (that is, about 198 to 216 producers for every three or four professionals), the service provided is reasonably efficient.

Small farmer organizations such as cooperatives, seed associations and other groupings, find it difficult to serve as technical assistance entities because when they have to finance contractual arrangements with technical teams, they must divert resources from the organization or else cut back on incentives to the professionals under contract. This situation encourages organizations to contract less expensive professionals, who are usually less qualified.





Capacity building and entrepreneurial training programmes have had a positive effect in changing social life in rural areas. Human resource development stands out as a transformative and highly influential factor, especially notable in the technical aspects of business training, the organization of local cooperatives and the establishment of community organizations. This is the basis of Chile's social capital.

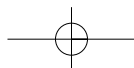
Since 1978, Chile has experimented with different arrangements for its extension system for small farmers, all of which share the characteristic of private delivery and public funding of services. "No other developing country – and few developed countries – can show this continuous track record of more than two decades of contracting extension services with private sector organizations" (Berdegue and Marchant, 2002). Extension services are paid in part by the public sector, but provided by the private sector with co-financing from agricultural producers.

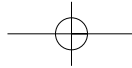
With respect to the extension system, however, Cox and Ortega (forthcoming) point to an evaluation conducted in 1998 that found the extension programme had positive economic impacts, but that there were still several severe problems. Cox and Ortega state that one critical issue is the lack of a social control mechanism to ensure *client satisfaction and ownership*. They argue that transfer of the Extension Bonds to the farmers themselves would seem an ideal solution to this problem. Another problem they cite is the lack of a centralized system of *M&E* to facilitate the quality control of services provided in different regions and to reduce potential political interference. They also underscore the lack of a system of *technical support for extensionists*. Extension partnerships with INIA have not produced the results expected, nor have cooperative agreements with the universities.

Finally, Cox and Ortega argue that where economic and market factors are more critical to the success of farming activities than are technical constraints, there is a need to explore ways of providing the comprehensive assistance (including financial management, farm management and marketing assistance) required for successful farming operations. One option would be for extension service providers to *share in the results* of innovation, in order to ensure that they take into account market opportunities as well as risks. The Chilean model is now promoted enthusiastically throughout the world in an ongoing drive towards privatization, and the time is ripe for a practical review of its advantages and limitations.

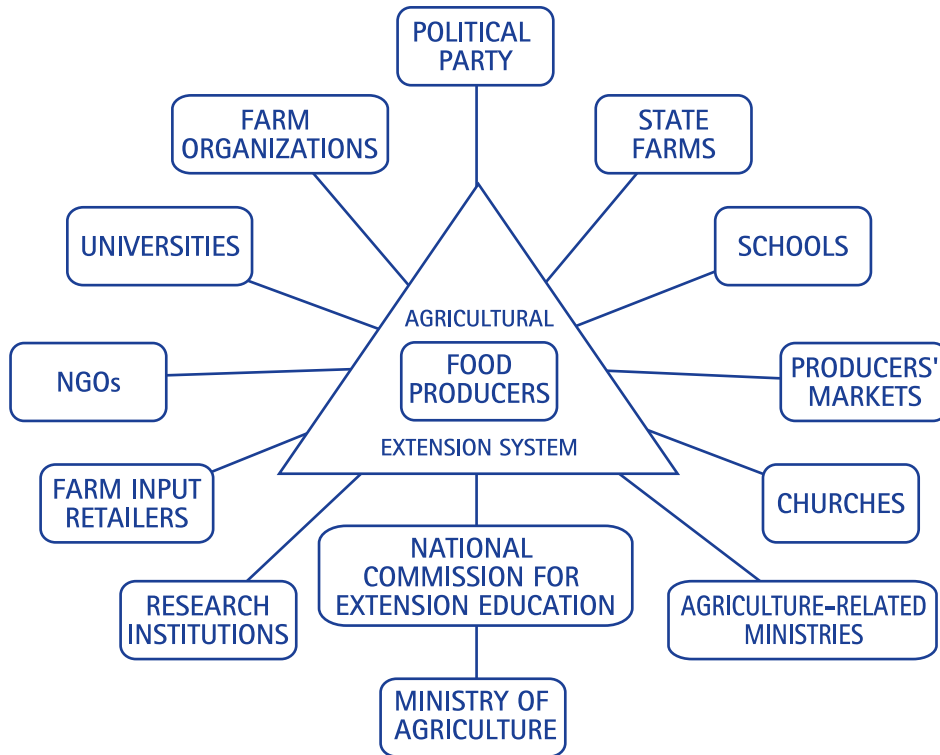
## CUBA

Cuba has a modernizing and innovative public sector AKIS/RD and represents a special case in that its previously centrally coordinated AKIS has experienced an about-face since the economic shocks it suffered in the 1990s. Cuba's objectives for the agriculture sector are to be as self-sufficient as possible and to use the country's natural resources in a sustainable manner. Its ultimate success is to develop as a society that lives within its natural means and in which all people have food security, higher education and health care. Disintegration of the former Soviet Union (Cuba's main economic supporter) in 1990 left the country with little choice but to turn inward and redirect its strategy towards food security, sustainable agriculture and sustainable development. That turn of events has resulted in the evolution of a set of AKIS/RD programmes that are open to more pluralistic approaches and closer integration with agricultural producers and communities, and that are increasingly productive.





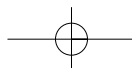
**Figure 6**  
**Extension contributors in the Cuban AKIS**

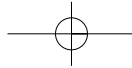


Source: Adapted from Carrasco, Acker and Grieshop, 2003.

The Ministry of Science, Technology and Environment, established in 1994 as part of the reorganization of the Cuban State apparatus, appears to be the main organism of the State central administration charged with elaborating and proposing to government all matters concerning science, technology, innovation and the environment. However, decision-making authority and implementation control are increasingly devolved to a range of participants. "In a sense, a decentralized, lightly coordinated extension system has evolved, one focused on increasing AKIS efficiency in support of food security" (Carrasco, Acker and Grieshop, 2003).

The processes of deconcentration and decentralization that are currently taking place within Cuban society significantly facilitate interactions among the components that characterize the AKIS programmes. All the organizations involved in the AKIS/RD are decentralized, both administratively and with regard to community involvement or subsidiarity. Operational and support processes devolve decision-making to the lowest possible administrative level, on the basis of its organizing competence and its human, material and financial resources. This strengthens the development and consolidation, as well as the effectiveness and efficiency, of the institutional links between the AKIS/RD development agents and the communities and





agricultural producers. In general, the organizations use and foster participatory approaches in planning, implementing and monitoring the AKIS/RD functions. Different stakeholders are invited to participate in planning and developing the various projects. One example is that agriculture delegates (representatives, promoters and extensionists) now participate in the Popular Council. Another example is the inter-institutional relations that exist at all levels to help develop national, provincial, territorial and local policies. There are also some competitive advantages of territorial development in that local communities can enter the process and help to confront the emerging challenges of globalization.

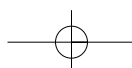
The various government organizations do not have a specific AKIS subdivision, but AKIS and sustainability concepts permeate all programmes and projects relating to natural resources, including agriculture. Research, education and extension organizations appear to work well together and, equally important, with the agricultural producers. An operative, integrated AKIS/RD appears to exist, although there is no mention of AKIS/RD units within the organizations. Nonetheless, AKIS project mandates are clearly stated by each organization, always within the parallel objectives of being institutionally self-sufficient and sustainable and with the aim of promoting environmental and agricultural sustainability.

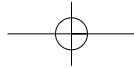
The Agricultural Extension System (SEA) is the main catalyst of communications among production, research and education institutions, and serves as a means of contact with producers as well as with research and technical assistance services provided by the Ministry of Agriculture. There is central supervision, but it is moderate now that Cuba has considerably decentralized its agricultural institutions. Branch supervision is stronger however, because government is far more concerned with local developments.

The government has created Basic Cooperative Production Units to decentralize and strengthen management, innovation and productivity. Its National Association of Small Farmers represents the interests of small farmers. Its farmer-to-farmer extension programmes emphasize training and group learning, and count on 2 500 facilitators and 5 000 promoters (with, apparently, 5 000 more about to join). Cuba's Strategic Plan for the Agricultural Extension System (1998) envisions networks of researchers, extensionists, educators and producers, and emphasizes networking through mass media extension activities. A strategy plan has also been developed for an Agricultural Science and Technology Innovation System. The national strategic planning process appears to be even more important than formal policy formulation.

Public sector programmes appear to be at least partially demand-driven. There is no mention of support for agricultural markets, but internally there is a major drive to promote local markets and urban agriculture, which is important in Havana for food security. Regarding input supplies, there is a network of stores where agricultural producers can buy equipment, seeds and other supplies, as well as receiving technical advice. The condition of its physical infrastructure remains one of the many problems that Cuba faces.

One of the most important aspects of Cuba's AKIS/RD is the attention paid to human resource development. There is constant updating of staff. Research agencies do not consider a project to be finished until it reaches the people, and extension agents are continually provided with new agronomic and other agriculture-related information. Each organization has a sustainable human resource base. The government ensures that there are enough skilled individuals for required tasks.





For instance, when it was known that more extensionists were needed, the schools were directed to provide a specialization in agricultural extension, in addition to the traditional majors in agricultural education and agricultural research.

Cuba has instituted public fora that promote the participation of agricultural delegates who represent their communities and are active in policy formulation and other aspects of agricultural development. Contrary to pre-1990 policy, Cuba now encourages the involvement of NGOs (including church organizations) and agricultural producers in programme development.

Cuba appears to be the exception in the Caribbean region when it comes to gender issues. Women are given full responsibility and participate fully in social and economic development. Women constitute 58 percent of higher education students, and the first extension professionals to graduate from the Agrarian University of Havana were women. Recognizing the importance of women in agriculture and agricultural research and extension, as well as promoting the preparation of women professionals in agriculture, is a strength for any country.

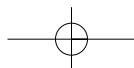
Although much has been achieved, there remains much that needs to be accomplished in the technology sector. Computer education is now a part of the national education system, and the importance of computers in AKIS/RD is well recognized; however, a major constraint in this regard is the geopolitical situation of the country. Cuba lacks adequate funding for AKIS/RD, and depends heavily on cooperation at the local level for the system's development.

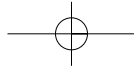
## **EGYPT**

Egypt is on the road towards developing an AKIS/RD, but still retains a traditional system oriented to technology transfer – a top-down, albeit somewhat deconcentrated, administrative system.

Agriculture is the largest employer in Egypt and a major contributor to GDP. All but a small part of Egyptian agricultural production occurs on some 2.5 million ha of land, mainly located in the Delta and along the Nile valley. With a large number of farmers and limited land, farms are small, averaging about 1 ha in size. The combination of water from the Nile, fertile soil and a mild climate makes Egyptian agriculture one of the most productive systems in the world. Almost all crops are irrigated. Two or three crop rotations per year are possible on the same piece of land. The major crops include cotton, rice and maize in the summer, and wheat, berseem clover and beans in the winter. Sugar cane occupies about half of the arable land in Southern Egypt. Citrus and vegetables are important crops in the Delta and reclaimed desert lands.

Egypt's research system for knowledge generation has led to productivity increases in most crops, and to enlarging the cultivated area in the desert and conserving natural resources through producing new varieties and technologies. The national research programmes of the Agricultural Research Centre are developed in cooperation with other research institutions and universities. The extension system has also played an important role in disseminating these technological packages, employing different printed and audiovisual extension methods and tools. Extension centres are expanding to cover the whole country, with the agricultural directorate at the governorate level participating in the development of local-level extension plans. There is coordination between the Ministry of Agriculture and Land Reclamation (MALR) and other





ministries in conducting extension and cultural seminars at the national level. The education system with its faculties of agricultural and secondary schools covers the whole country. The curricula and scientific departments in these colleges are based on the environmental needs and ecological zone of the area in which each college is located. However, curricula and teaching require upgrading and there is a gap between graduates from the education system and professional market demands.

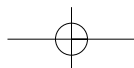
The government has authorized the establishment of Regional Research and Extension Councils (RRECs) in six distinct climate zones. These RRECs are an effort to bring research and extension services closer to the farmer and to open up the decision-making process to local interest. This move also aims at decentralizing the planning, implementation and evaluation of research/extension work down to its agro-ecological base, as well as enforcing participatory approaches by involving all stakeholders in these processes. The initiative has been successful in bringing upper-level management together, yet it is still in need of support and empowerment. The weakness is that MALR initiates the RRECs, but its decisions are obligatory only for the agriculture sector, even though the RRECs involve multidisciplinary teams.

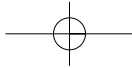
In addition to the deconcentration of central government authority to branch offices and centres, the Egyptian government has allowed some responsibilities, decision-making and administration of public functions to be transferred from the central to local governments or semi-autonomous organizations that are not wholly controlled by the central government but are accountable to it. In general, this situation operates as a general policy in government institutions as well.

The RRECs and national campaigns are two powerful linkage mechanisms at the national and regional levels.

The Agricultural Directorate at the governorate level is the key organization for the implementation of agricultural field activities, including national campaigns and foreign financed projects. The directorate is linked to all the other entities working in agriculture. Its main role is planning for the whole agriculture sector in the governorate, including variety selection and provision, staff training, extension activities, environmental conservation, integrated pest management practices, the development of rural youth and women, and coordination with other local organizations. The Agricultural Directorate is administratively responsible to the Governor (linked to the Ministry of Local Authority), but for technical matters reports to related central administrations of MALR.

Research produced in the universities is generally not used in the field, and the curricula of agricultural colleges and secondary schools are not related to market needs. The mechanism for changing the curricula in educational institutions is rigid and does not respond to the needs of the world outside these institutions. For example, central management of secondary schools has led to a clear separation from the environments in which the schools are located. Centralized financial resources for extension lessen the efficient implementation of plans and prevent quick response to local-level needs. No mechanisms were identified that allow farmers to collect their expertise and to participate in preparing extension plans. Farmers' organizations are not strong enough as the government has influence on their decisions and interferes in their business. The Agricultural Advisory Councils need to be strengthened in order to perform their roles in coordinating different agricultural activities and solving problems at the district and governorate levels.





Agricultural Advisory Councils have elected farmers to their boards, but because of the strong link they maintain with the government, there is low farmer participation. There is low small-farm participation in the cooperatives, and farmers reported that they rarely participate in programme planning. Farmers are integral in providing feedback for each unit.

Although there are efforts to make available international agricultural knowledge through the Egyptian National Library, and to encourage professional travel to international conferences, as well as visits to leading research institutes, many researchers and educators complain of a lack of access to international knowledge and limited exposure to the international community. Thus, links to global knowledge are weak.

In Egypt, information and communication technology is currently being used to strengthen the linkages between research and extension. The Virtual Extension and Research Communication Network (VERCON) and Expert System technology are being employed successfully in the research institutions and by extension services within MALR. There are plans to extend this network horizontally to include more governorates and new stakeholders, and vertically to comprise more contents. VERCON provides a separate space where research and extension communicate and cooperate, but farmers reported that they sometimes receive conflicting recommendations from the system. AKIS operators and producers lack financial and physical resources, including computers and connections to the Internet.

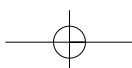
MALR is in charge of planning, monitoring and providing resources for extension. Finances come from the Central Administration for Agricultural Extension Services, and from independent donors for specific projects. An interesting note is that the central government is transferring control of water resources to farmers; much of the available money for farmer groups comes from commercial returns. MALR also provides additional funding. Every cooperative has its own budget and makes its own plans for action.

## LITHUANIA

Lithuania has a modern AKIS that is rapidly evolving in response to changing markets and social needs. Since regaining independence in 1990, the country has reformed its agriculture sector, trying to orient it to market development and market signals. The rural economy plays an important role in Lithuania's economy and society. In 2001, 32.8 percent of the population resided in rural areas. Agriculture is the core of the rural economy, providing employment to 19 percent of the labour force; agricultural and food exports make up 10 percent of total exports. The country has committed itself to being fully ready to enter the European Community (EC).<sup>13</sup> In 2000, the Lithuanian Parliament adopted an agricultural and rural development strategy to cover the period 2001 to 2006, and a long-term strategy up to the year 2015 is currently being drafted. Lithuania has developed new laws, and plans provide a framework for rural development.

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<sup>13</sup> Lithuania entered the EC in 2004.



In Lithuania responsibility for policy formulation is dispersed in various ministries. For example: the Ministry of Labour and Social Security is responsible, *inter alia*, for labour market policy formulation and implementation, including professional training; the Ministry of Economy is responsible for supporting innovations and improvement of the technical, managerial and information competence of enterprise managers, and participates in implementing the Creation of the Information Society Programme; and the Ministry of Environment is involved in the preparation and implementation of education programmes, the introduction of research results and the diffusion of information technology in the forestry sector. The "brain" of Lithuanian science programmes, according to the case study, is the National Academy of Science, which has a Division of Agriculture and Forestry.

When land reform and farm restructuring began, the rural population was increasing, but more recently this trend has reversed and the rural population has started to decline. Rural infrastructure is underdeveloped and the quality of life is lower in rural than in urban areas. Rural poverty is widespread. In 1999 the rural poor made up 28 percent of the rural population (the respective share in the cities was 7 percent, and the national average 16 percent). The rural population is ageing rapidly, and the education level of rural people is considerably lower than that of city dwellers, with only 5 percent of rural inhabitants having completed higher education. As there are more children in rural areas than in the cities, a vicious circle of poverty could develop, with low investment in human resources continuing as a result of poverty. This requires a long-term agricultural and rural development strategy to develop education, research and information systems.

Lithuania currently possesses a uniform and reasonably developed network of scientific, educational and consultative institutions. The AKIS institutions operate within the Agricultural Chamber, which is the main umbrella organization of the rural self-governance organizations. The Agricultural Chamber brings together producers, processors and traders of agricultural and food products, providers of agricultural services in rural areas, and NGOs. Established in 1926, it remained operational until the Soviet occupation of Lithuania. In 1991, it was re-established, and has developed a network of regional branches in all 44 regions of the country.

In 2001, the chamber united nearly 100 organizations, associations and producer groups. Its largest and most influential members are the Farmers' Union and the Association of Agricultural Companies. Government provides financial support to the Agricultural Chamber, which also collects its own fees for membership and services. Among the most important functions of the Agricultural Chamber are providing advice, disseminating information, organizing training, exhibits and fairs, and disseminating and implementing progressive technologies. The chamber also carries out education and training activities through its member associations, which engage in joint international programmes.

The chamber is responsible for implementing the cooperative development programme, monitoring human resources in rural areas, and assisting in the preparation of agricultural and rural development programmes. It publishes education and information literature, and its publication "Rinka" (Market) is very popular among farmers. One of the most active members of the chamber is the Young Farmers' Association, which unites more than 2 000 young farmers under the age of 35 years. Young farmers' groups often work together with general education and agricultural schools, and are also responsible for youth leadership training.

The Agricultural Chamber essentially serves to promote agricultural knowledge and information exchange and to cater to the needs of members, especially for market information. The adult education system is well developed and foresees the need to reform in order to promote greater specialization and quality in training programmes. The extension system seems well developed with a regional base of offices, and takes a proactive approach to education and advisory service provision. While it may be too early to achieve 100 percent cost recovery, there is movement in this direction, along with a serious attempt to develop a market for services and to serve the real needs of agricultural producers.

The Agricultural University and the Rural Business Development and Information Centre (RBDIC) have accumulated experience in the process of creating and implementing information systems. However, specialists lack sufficient training in the utilization of information technologies, and there is a shortage of knowledge with regard to the possibilities provided by these technologies. There is limited financial reward for most agricultural producers, many of whom would like to acquire computer equipment and utilize e-mail. Some components of Agricultural Information Systems (AIS) suffer from weak interaction and are insufficiently developed, as is the communication infrastructure in rural areas.

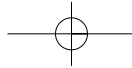
There is good collaboration among research, extension and education, and good international links throughout the system. The agricultural extension service works on both community and rural development – not just agriculture – and extension responds to market changes, especially regarding EC integration. The research system has a well thought out division of labour, although it appears that research funding is being reduced. In general, research appears to be quite productive.

Lithuania's publication record is strong and reflects technological innovation. A *Farmer's Adviser* newspaper and other periodicals appear quite effective. The Agricultural University is involved in research and has good links with producers. The AIS integrates farm accounting, livestock and crop databases, as well as market information. This might be unwieldy, but seems to be working. The necessary increase in rural connections to the Internet is under way.

Innovation is highly important for Lithuania, especially in its effort to fulfil the demands and enter the privileges of the EC. Accordingly, the country's AKIS/RD is striving to move rapidly towards a pluralistic innovative system based on private institutions and responsive to market needs. Its effectiveness derives from the linkages that are developing among the different institutions, as well as the use of mass media and ICTs that along with a highly literate population reinforce these linkages. Continued investment in rural education is important to maintain AKIS/RD, however, and the case study consultant asserts that the AKIS are inadequately funded, thus reducing their potential impact on commercialization.

## **MALAYSIA**

Malaysia's Third National Agricultural Policy (NAP) for 1998 to 2010 was launched with the primary aim of transforming agriculture into a modern, dynamic and competitive sector. It laid the foundation for viewing agriculture in terms of its potential contributions to GDP, adjustment to the trade imbalance, increased private sector participation, improved producer incomes and enhanced



innovation and technology capacity. In other words, the third NAP provided the impetus for rethinking and re-engineering Malaysian agriculture in the face of global demands and challenges. Of particular note, according to the case study, is that in 1999 a new Minister of Agriculture with wide experience in the corporate sector was appointed to the Cabinet. Under his leadership, the case study states, the Ministry of Agriculture's (MOA) policies changed for the better in terms of promoting agriculture as a vibrant sector worthy of larger investments and recognizing its potential to contribute meaningfully to the economy. A new dynamism was injected into the ministry's agencies, and a revived concern was sparked for designing commercial projects, large-scale commodity production, planned implementation and strict monitoring of results and progress. By mid-2000, a new model for the agriculture industry in Malaysia emerged, which focused on producing high-quality agricultural and food products that are market- and technology-driven.

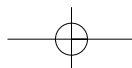
Malaysia's AKIS institutions are not necessarily innovative in terms of AKIS/RD principles, but it has aligned its agricultural (sub)systems so that they function quite effectively and efficiency, albeit they are dedicated primarily to commercial production. The case study highlights four major factors in technology transfer (see Box 4).

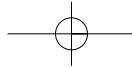
Most of Malaysia's AKIS agencies have similar administrative structures that are mainly centralized in terms of the delegation of powers. Each agency has a central, national administrative office, a state administrative office and a district administrative office. At each administrative office, there are several divisions or units, which were established according to the job, task or activity. Each unit at each administrative office is staffed by several officers, led by the Director-General at the national level, the State Director at the state level, and the District Supervisor at the district level. The central administrative office tends to delegate decision-making authority to the state and district administrative offices, but in practice much decision-making is carried out at the central office or by the ministry itself; only a few tasks are delegated to other administrative levels. Figure 7 shows how Malaysia's AKIS/RD is likely to develop in the future.

**Box 4 - Factors in technology transfer**

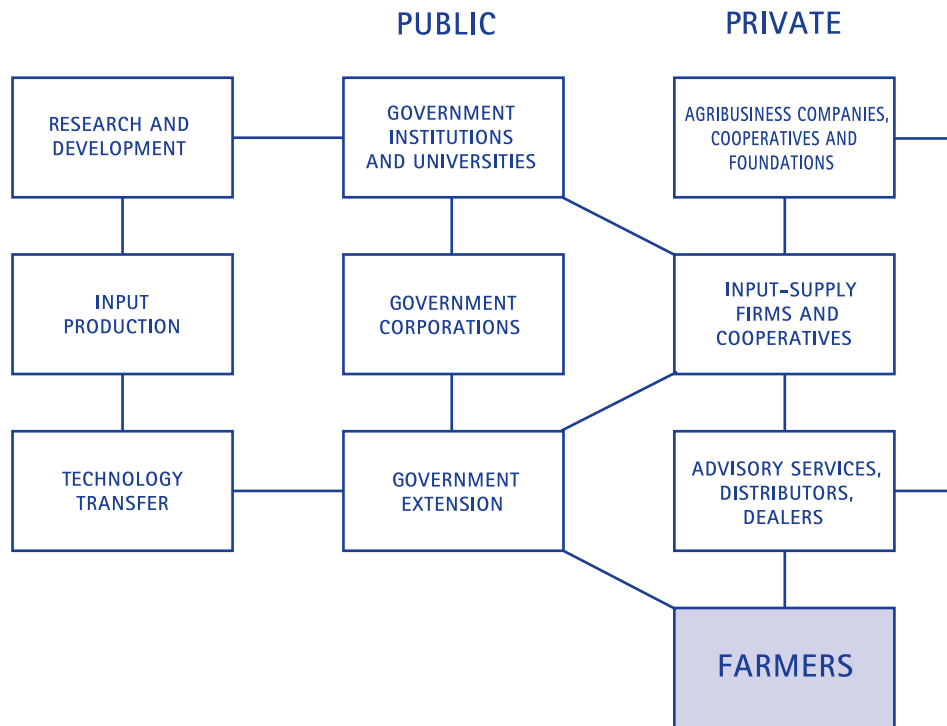


At first glance, Figure 7 suggests a traditional, technology transfer approach; however, this need not be the case if agricultural producers are encouraged to participate in the AKIS programme development processes and if a demand-driven orientation balances the emphasis on commercial agricultural development. Malaysia's system needs to place greater emphasis on targeting the public goods of food security, sustainable agriculture and environmental conservation, in order to respond to the AKIS/RD emphasis on developing relevant and effective processes of knowledge and technology generation, sharing and uptake.





**Figure 7**  
**Research and technology transfer links among private and public institutions**

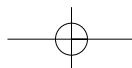


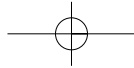
Source: Adapted from Pray and Echeverria, 1990.

The Malaysia Agricultural Research Institute (MARDI) carries out field research in farmers' fields. However, farmers do not actively participate with the researchers. Formal monthly planning meetings and weekly conferences between MOA and its agencies facilitate joint planning and collaboration; through this mechanism the Minister meets individually with each agency head, and written decisions are followed up through a decision tracking system. However, at the field level, there is limited formal and informal collaboration. No formal mechanism for collaboration was found at the operational level within the agencies of MOA.

Agricultural operators lack a clear concept of AKIS/RD strategies. Investment in programme activities and training at all levels would contribute to the success of the government's strategy. Training and education of staff and farmers is needed to help all involved to operate and maintain new technology, and the communication network system would become more effective if farmers were better educated. Many Malaysian farmers are illiterate and poor, and have difficulty using Internet services and thus accessing Internet-based agricultural information. Modern computer/Internet technology would greatly assist Malaysia in moving more directly towards the public good goal of the AKIS/RD vision.

Assisting farmers in the formulation of business plans relating to farm and fishery operations results in some collaboration between extension and the private sector. The MARDI Research Council includes representatives of agencies and the university, and functions as a mechanism to





promote integrated operation among these. The Farmers' Organization Authority (FOA) elects a Board of Directors for each district every two years, and this board is considered a viable mechanism to ensure farmer participation in the planning, implementation and monitoring of FOA's programmes. Ad-hoc committees operating between the agriculture agencies and the private sector appear to be especially useful in piloting R&D projects in a coordinated manner.

An area of AKIS strength in Malaysia is the incorporation of a common goal and the coordinated action of the several agencies acting under the centralized planning of MOA. Additional strengths are the wise use of information technology to increase access to information for farmers and other agricultural operators, and recognition of the importance of human resource development in agriculture, together with the investment necessary to achieve a new agricultural model.

A weakness identified is the limited inclusion of farmers and their representatives in the decision-making processes of the various agencies, especially the research agencies. There are limited efforts to increase farmers' active participation in helping to shape the activities of agencies that directly affect them. In fact, the case study noted that the "coordinated and cooperative spirit among the main actors existed at the highest level, but it has yet to trickle down to the district and operational levels". Another weakness is that much research is not relevant to agricultural development and does not benefit farmers.

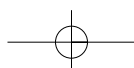
MOA's agencies received sufficient financial resources from the government to carry out their activities, especially after the third NAP established agriculture as a strategic sector for the country to reduce foreign food imports. These agencies had the role of transforming Malaysia's agriculture into a competitive modern sector, but their human resources were too limited in terms of numbers and qualifications to achieve this new objective.

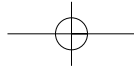
The third NAP encouraged a greater collaboration between MOA's agencies and selected private sector companies in the fields of research and large-scale agricultural production. This has been key to the success of the overall system. The private sector cost-shares 5 percent of MARDI research, with the government providing the balance – much of MARDI's funding comes as grants from the Ministry of Science and Environment. Greater private sector investment is likely to make the system more effective, and this is likely to stimulate and be sustained by research activity becoming more oriented to farmers' needs. To support the system's continued evolution, Malaysia's farmers need training in several subjects, especially and urgently in how to develop business plans. Investment to develop stakeholder capacities is crucial to the ultimate success of the Malaysian AKIS/RD because financial and human resource development constraints may discourage joint planning between farmers and extensionists, educators and researchers.

## MOROCCO

Morocco has an established but evolving system. It recognizes the priority role of producer organizations and the importance of participatory approaches, although these are not yet fully operative in the system.

The Ministry of Agriculture considers agricultural extension to have a primordial role in agricultural development by providing both information and training for farmers in agricultural





production and marketing techniques, professional organization, and preservation of natural resources and the environment. At the central level, extension activities are led by the Direction of Education, Research and Development, Division of Agricultural Extension. The National Centre of Studies and Research in Extension provides a support structure for the different extension programmes. A National Committee of Technology Transfer was constituted in 1994, bringing together various bodies concerned with extension. At the regional level, Regional Offices of Agricultural Development (ORMVAs), Offices of Extension and professional organizations are in charge of extension activities. Currently, these are carried out through the Support Project for Agricultural Development (PSDA). In the Provincial Department of Agriculture (DPA), extension is the responsibility of the Offices of Promotion and Support to Professional Organizations.

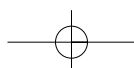
Regional Committees of Technology Transfer represent the national committee at the regional level, and provide a regional institutional framework for development (DPA and ORMVA), education, research and professional organizations. Particular emphasis has been placed on training DPA and ORMVA extension staff in order to update their knowledge and improve their communication skills with farmers. For this purpose, eight Regional Centres of Agricultural In-service Training have been created and furnished with equipment. These centres also train farmers' children. As well as this network of training centres, the National Centre of Extension Studies and Research and the Perfection Centre at Mehdia also actively participate in national training programmes.

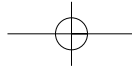
There are 122 extension centres, all with decision-making authority and financial autonomy. These centres are managed by a Board of Directors, which is chaired by the local authority and composed of farmer representatives, DPA technical services representatives and a representative from the Finance Ministry. Each centre is divided into sections for agricultural extension; cooperation, credit and agricultural investment codes; benefits; and administration and management.

There are also 179 Centres of Agricultural Development, which carry out integrated production and follow-up farming operations, and function as intermediaries between the extension service and the professional organizations of the ORMVA. Thus, decentralization is an important aspect of the Moroccan system, and an obvious strength in its evolving AKIS/RD.

The PSDA is funded by the World Bank and has made numerous contributions to development and to the advancement of AKIS/RD. The project promotes the participatory approach and contributes to improved planning and implementation of extension activities. Agricultural extension services have also been improved by instituting precise tasks and sustained training for staff and farmers. The PSDA tailors extension approaches to the specific situation of each ORMVA. For example, it promotes extension by farm advisers in Souss Massa, contractual extension in Tadla, extension by demand in Ouarzazate, and on-farm demonstration workshops in Tafilalet.

In spite of the generally low numbers of women in ORMVA extension programmes, the PSDA has contributed to efforts aimed at improving the well-being of farmers' families through training women farmers and financing several income-generating projects. Another of the project's innovations was the organization of groups of women farmers to visit areas outside their own ORMVA regions, thus encouraging the exchange of experiences of financing and managing income-generating projects.





Training constitutes the most dynamic aspect of the PSDA, and has been provided for all the stakeholders in agricultural development (supervising staff, technicians, farmers, rural women, professional organization members). Initial and on-the-job training of the staff in charge of agricultural development has led to notable improvements in their working methods. The training of farmers not only improves their technical skills, but also makes them more able to express their needs and define programmes.

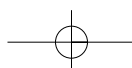
One key institutional mechanism that links AKIS/RD operators in Morocco is the Economic and Social Development Plan (PDES). This brings operators together every five and two years for the Commission of Agriculture and Dams and the Committee of Education, Research and Extension, which is also known as the Subcommittee of the Technological Sector. The plan organizes all the actors involved in the technological sector of agriculture and forestry. One consensus to emerge is the necessity of integrating technological activities in agriculture in order to permit better synergy of efforts and more rational management of resources. According to the case study, this has proved to be a success, but the newly formed synergy has still to be translated into a technological sector that helps the agriculture and rural sector to integrate itself better into the national economy, thereby responding to the challenges of both local development and globalization. As the case study points out, it makes little sense for a so-called integrated system to have producers who are not organized and who do not attend PDES meetings. The case study underscores the need for a policy that provides for the contracting of services, and makes all the various AKIS/RD operators assume their functional and overlapping responsibilities.

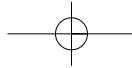
The first PDES meeting organized all the actors involved in the technological sector of agriculture and forestry. Recognizing that agricultural education, research and extension are complementary, the plan emphasized the importance of linkages and underscored the need to improve integration and resources management. However, the farmers were not sufficiently represented, and one of the main constraints to the sector was identified at the meeting as being "the weak degree of linkage among the components of the sector and their respective socio-professionals".

AKIS professionals at the national level appear unprepared as yet for their role as partners with State institutions in agricultural and rural development. A policy is needed that involves contracting the private sector for various services, as is a mandate that will make all those involved assume their professional responsibilities. Morocco's AKIS/RD needs adequate funding to support innovation and improve the quality of instruction, research and outreach. The World Bank-funded PSDA has helped to fill this void, but over the longer term more diversified and sustainable financing arrangements – including user fees – will be needed to strengthen the system.

## PAKISTAN

Pakistan has formulated a National Agriculture Policy whose five explicit goals are social equity, self-reliance, export orientation, sustainable agriculture, and enhanced productivity. These goals have their roots in the recommendations of the National Commission on Agriculture (1988) and the subsequent national farmers' convention held in 1990. Not enough effort is made to direct public funding to public good issues. Most programmes are top-down and have little effect on agricultural producers. The case study made no mention of the economic efficiency of planning and budgeting for the agriculture sector.





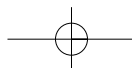
Agriculture, rural development and education are constitutionally the responsibility of the federal government, which governs their policy planning, resource mobilization and interprovincial coordination. The provincial governments are responsible for implementing the programmes covering these subjects. The Ministries of Food, Agriculture and Livestock, of Rural Development, of Local Government and Environment, of Education, Science and Technology, of Women, Population Welfare and Social Development and of Information and Broadcasting at the federal, and their corresponding line departments at the provincial, levels are the major AKIS/RD operators. In addition, agricultural universities and colleges, some NGOs and private sector organizations directly or indirectly perform roles similar to major AKIS/RD operators by planning and undertaking activities in agricultural research, extension and education.

Pakistan's AKIS/RD is essentially a State-based system that is relatively well established, but retains traditional organizations for research, extension and education. Pakistan's public sector programmes are not demand-driven, and the top-down approach appears to dominate in most AKIS institutions. Linkages are poor, and there is little evidence of joint planning for AKIS/RD. On the positive side, some institutions have taken gender issues into consideration with respect to individual programmes.

The Pakistan Agricultural Research Council (PARC) is the apex national scientific body that undertakes, aids, promotes and coordinates agricultural research, organizes high-level training, and acquires, disseminates and promotes the adoption of newly evolved agricultural technologies through its network of research and technology transfer institutes located throughout the country. PARC performs its mandated roles in collaboration with provincial institutions/organizations in order to avoid duplication. For example, PARC carries out basic and strategic research, while the provincial research institutes deal with applied and adaptive research. However, the universities are autonomous bodies and perform their educational and research roles independently, with very little joint programming and linkages with PARC and private sector AKIS/RD operators. All AKIS/RD operators seem to be aware of their roles in the system, but gaps exist in the perception and performance of these roles at all levels.

Pakistan's National Agricultural Research System (NARS) is a top-down hierarchy that conceived an interministerial, inter-institutional and interprovincial coordination mechanism with the participation of representatives of all AKIS/RD operators. Small farmers are hardly involved in this coordination mechanism, which faces a number of operational problems, making it ineffective as a planning and implementation coordinating body.

To help overcome these and similar problems, the Government of Pakistan introduced administrative reforms under the Devolution Plan, by which most of the responsibility for programme planning, implementation, coordination and inter-agency linkages are entrusted to district-level management. The Devolution Plan seems to be a step in the right direction for decentralizing decision-making and enhancing the participation of local leadership in the planning, development and implementation of needs-based programmes as a component of AKIS/RD. Under the plan, agricultural extension is decentralized to the district level, and decisions related to programme planning and implementation are made after consultation with representatives of research, education and other relevant development agencies, including NGOs and the private sector at the district level. However, the operators of the plan at the district level are not yet fully conversant with the concept, philosophy and strategies of this new good



governance policy. As a result, the AKIS/RD is facing more difficulties than before regarding the establishment of linkages with all AKIS/RD operators within, as well as outside, the districts. Districts have now become isolated entities with no linkages to other districts, even within the same province. The case study argues that extension should be autonomous, with authority for administrative and financial decision-making, if it is to become effective.

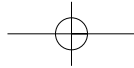
Agricultural research, extension and education programmes in general are examples of a hierarchic top-down system of administration in which decisions related to policy planning and programme development and implementation are taken by the top administration without much involvement from other stakeholders and are implemented by field staff. The research system in particular does not encourage autonomy or decentralized authority regarding administrative, managerial and financial decisions. Its policies and programmes are well conceived but highly ambitious and often theoretical in nature. A slight exception to this general situation can be observed in the programmes being planned and implemented by autonomous bodies, such as universities and NGOs, which promote needs-based, bottom-up planning and development approaches that encourage the participation of small farmers, women, youth and other marginalized groups in society.

Agricultural education is provided by five agricultural universities, six agricultural colleges, eight field assistant institutes and a number of technical/vocational education institutions with an agrotechnology focus. These institutions have administration, financial and operational linkages to the federal Ministries of Education and of Food, Agriculture and Livestock and with the Provincial Departments of Education and of Agriculture. However, none of these universities and colleges has any joint education research and extension projects or programmes. They have been divorced from agricultural research and extension since the 1960s, when universities were separated from agricultural departments.

Pakistan does not yet have any AKIS/RD units dedicated to creating and facilitating linkages in either its research or its extension institutions. It is a hierarchical top-down system with varying degrees of participation by research scientists, educators, extensionists, farmers and other stakeholders in programme planning, implementation, M&E, documentation and information dissemination. Elected boards supervise most institutions, but AKIS professionals appear to be reluctant to have their work supervised. The system needs a viable NARS based on the needs of farmers, agricultural scientists and all other stakeholders in the public, NGO and private sectors.

There are a number of innovative aspects to Pakistan's AKIS institutions. PARC is relatively decentralized and has potential as a coordination mechanism for Pakistan's AKIS system. Structures for institutional cooperation exist mainly among research institutions, although such cooperation appears to be minimal.

The AKIS/RD in Pakistan has less than the required financial, institutional and trained human resources to plan, implement and monitor the programme. Linkages among agricultural researchers, educators, extensionists and farmers are weak. Similarly, the interministerial, interprovincial, inter-agency and public-private/corporate sector linkages are poor, resulting in wastage of human, financial and institutional resources. Programme participation by agricultural producers is minimal, and attempts at cost-sharing are almost non-existent. For these reasons, an effective AKIS/RD is not yet being achieved.



## TRINIDAD AND TOBAGO

In Trinidad and Tobago, increasing the incomes of participants in the agriculture sector is recognized as an extremely important policy objective, given that agriculture provides the lowest returns of any sector in the economy. Farming cooperatives and other institutions for stakeholder cooperation in input supply, marketing and processing are recognized as instruments that can increase the returns that accrue to production and rural commodities. The Ministry of Agriculture Land and Marine Resources (MALMR) seems to be aware of these concerns, but has not provided the necessary resources for developing what the case study writer refers to as "the knowledge practices, economic services practices, and productive practices" necessary to advance an integrated AKIS/RD. Resource-poor farmers expressed a sense of being abandoned by MALMR.

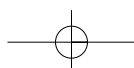
Trinidad and Tobago does not have AKIS/RD units in either research or extension. Although government and sub-government supervision exists, there is no widespread dissemination of innovations and no discussion of the constraints or benefits that might be associated with them. Career development and promotion opportunities seem very limited, although they were ranked high as a factor contributing to agricultural development.

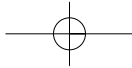
MALMR is highly centralized, financial resources are only minimally delegated to the district, regional or county levels, and there is a lack of public participation in policy formulation. There appear to be too many extension agents, and too much involvement of these agents in tasks other than diffusing agricultural knowledge and information to producers. There are few linkages among the research, extension and education institutions, although the National Marketing Development Company (NAMDEVCO) is one of the few institutions that is working closely with producers, and has developed systems of monitoring and evaluating its activities.

MALMR is not applying financial resources to develop the economic and productive practices necessary to advance an integrated AKIS/RD. It appears also to lack the leadership and commitment to develop an effective AKIS/RD. There are funds associated with research that could be directed toward AKIS linkages and, given the oil boom, it would seem that the government might finance an initiative such as AKIS/RD to advance the nation's socio-economic status. There is no evidence of resource sharing, and the private sector contributes little to agricultural research and extension. There have been few efforts to develop an effective AKIS/RD in Trinidad and Tobago.

Trinidad and Tobago does not have either a national AKIS policy or a formal agreement to promote an integrated AKIS/RD. The case study was forced to use old data (1988) for much of the analysis, suggesting that there have been few recent initiatives or reform efforts in the country to promote AKIS/RD development. The study suggests that Trinidad and Tobago has yet to establish mechanisms that emphasize the integration and coherence of policy formulation, planning and decision-making at the macro and micro levels. According to the case study, the existing education and training system, for example, is not providing the knowledge and skills necessary for development of the agriculture sector, thus contributing to a lack of competitiveness in the domestic and export agricultural subsectors.

Marketing extension services appears to be one of the few strengths in the Trinidad and Tobago AKIS/RD. NAMDEVCO has helped farmers to export and market their products, while the Land Information System leases approximately 17 000 state-owned parcels to farmers as a way of





improving land tenure; however little information is available on issues involving the environment, income generation or the improvement of producers' quality of life.

Four public sector programmes mentioned as being demand-driven – new varieties of cocoa, new varieties of sugar cane, farm certification and hot pepper export – were developed by NAMDEVCO. Another parastatal Agricultural Corporation provides banking facilities for farmers, but according to the case study, access to credit needs to be increased. As might be imagined, infrastructure also needs to be improved, and effective linkages are lacking, except for those that occur on an ad hoc basis. As in most Caribbean countries (with the exception of Cuba), women's contribution to agriculture remains invisible and unrecognized. Although the proportion of women in education is relatively high, their participation in the job market is very modest.

Constraints to the development of an integrated AKIS/RD in Trinidad and Tobago include: lack of participation in policy formulation; problems of land tenure; lack of joint planning and programme development; insufficient human resource development (especially career development and promotion); poor staff deployment; lack of markets and inputs; absence of linkages among research, education and extension agencies; inadequate budget for research; poor education; absence of M&E and impact assessment; and lack of stakeholder participation in AKIS/RD decision-making.

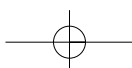
When Trinidad and Tobago was threatened by a multispecies infestation of hibiscus mealy bug of epidemic proportions in the mid-1990s, however, a policy and R&D-driven operation led to the participatory involvement of all relevant stakeholders. The double predator/parasite innovation for the bug's control was successful within a short period of two to three years.

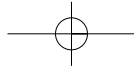
In summary, there appears to be a need for the State to become a facilitator of private sector activity and a supplier of essential public goods and strategic private goods, and to promote participatory involvement in agricultural development processes. Trinidad and Tobago seems to be somewhat remote from the threshold where good AKIS/RD systems begin.

## **UGANDA**

In Uganda, most rural people have not yet benefited from the country's incipient economic growth, as they remain largely outside the formal monetary economy. However, agriculture is Uganda's most important sector, contributing 48 percent of GDP and directly supporting 85 percent of the population in rural areas. Furthermore, it appears that this situation will increase into the foreseeable future. Food crops still account for at least 65 percent of agricultural GDP, and the sector remains characterized by low-input low-output production. Despite agriculture's importance, it remains constrained by insufficient information, knowledge, improved technologies and market linkages to catalyse increased production and productivity among rural farmers.

The Plan for the Modernization of Agriculture (PMA) is Uganda's main agricultural policy instrument and includes concerns for AKIS/RD. The PMA aims to bring about institutional transformation in order to foster agricultural growth and development. Recent policy shifts have already had some positive effects, including expansion of the commodity base to include several non-traditional cash crops. This has increased the demand for knowledge, information





and technologies. Uganda shows promise to become a demand-driven system in which farmers are empowered so that agricultural development programmes and activities are responsive to their needs. The PMA pays attention to capacity building, the decentralization of research to Regional Research and Development Centres, and cost-sharing as an element of the overall strategy.

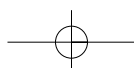
Uganda is on the road to modernizing its AKIS. AKIS/RD units exist in various public sector institutions. A decentralization process is in place, and is fostering the supervision of services mainly by institutions at the district and community levels. Thus, there is opportunity to develop an integrated AKIS/RD in Uganda owing to the government's strong political will and commitment to the Agricultural Modernization Programme as advanced in the PMA. The PMA provides a holistic strategic framework to eradicate poverty through a multisectoral investment approach. It has identified several intervention areas, including research and technology development, agricultural advisory services, rural finance, agroprocessing, agricultural education, natural resource management and infrastructure. Each of these is relevant to the development of AKIS/RD. The PMA promises better coordination and linkages, farmer empowerment and ownership mechanisms, decentralization and pluralism in service delivery. Equally important, the PMA is positively viewed by donors, and is thus expected to benefit from a wide support base.

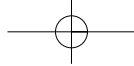
Research is being decentralized to Regional Research and Development Centres, and the Ugandan National Agricultural Advisory Services (NAADS) is projected as the government's programme to spearhead reform of agricultural extension provision. NAADS is to develop a demand-driven, client-oriented and farmer-led agricultural service delivery system that targets, in particular, the poor and women. The programme is grounded in the government's overarching policies of agricultural modernization, poverty eradication, decentralization, privatization, and increased participation of the people in decision-making.

The nationwide reform process under NAADS is bringing about a range of changes, which have four basic elements: 1) the transformation of farmers' roles and ownership, by empowering subsistence farmers to gain access to and control over agricultural advisory services, market information and technological development and to make contributions to service delivery; 2) the reform of the role and approach of agricultural advisory service providers, by shifting from public to private delivery of advisory services within the first five-year phase, and developing private sector capacity and professional capability to provide agricultural services; 3) the separation of the financing of agricultural advisory services from government provision, by creating options for the financing and delivery of appropriate advisory services for different farmer types, gradually reducing the share of public financing of farm advisory costs and using public finance to contract privately delivered advisory services; and 4) the deepening of decentralization, through the devolution of powers, functions and services to the lowest levels of government. However, the economy and these reforms remain largely dependent on external assistance.

Programmes are being developed to address the issue of human resource deficiencies at the local and institutional levels. Agricultural producers are currently being encouraged to participate in most aspects of programme development; however, so far they have little involvement in M&E.

Some structures exist for institutional cooperation. Private sector involvement is limited to ad hoc contributions during the planning process. Programme participation and linkages are mentioned





but do not appear to be continuous and are limited to only certain activities. Present programmes make use of traditional technologies, but modern forms of communication are limited owing to their cost and the low levels of literacy in rural areas.

The Ugandan programmes to be developed under NAADS are intended to be demand-driven. There is promotion of market-oriented commercial farming, and input supplies will be the responsibility of the private sector. On the minus side, poor linkages currently exist among AKIS/RD operators, and no mention is made of joint planning or other formal linkage mechanisms. The case study also makes no special mention of gender issues under either current or future programmes. Uganda is strongly dependent on external funding for AKIS/RD, and this is provided largely by lending and donor agencies, as well as the government. Farmers are encouraged to contribute, but at present are unable to do so because of their poor financial situation. Future programmes are directed towards stakeholder capacities, and there are plans to increase literacy in rural areas and to train agricultural and other stakeholders in managing the decentralization process. Expectations are high for the development of a fully fledged AKIS/RD.

