

# Market Linked Innovation Systems

## Opportunities for Strengthening Agricultural Development in Ethiopia

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Report for the Netherlands Embassy in Ethiopia



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# Executive Summary

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This study on Strengthening Market Linked Innovation Systems was produced at the request of the Royal Netherlands Embassy in Ethiopia. It offers a perspective on how innovation processes and capacities could be further developed in support of Ethiopia's Economic Growth and Transformation Plan (EGTP) and the Agricultural Growth Programme (AGP). More specifically it provides recommendations to the Netherlands Embassy on strategic priorities in supporting development of agricultural sector in Ethiopia.

## *Background*

Agriculture is critical to the Ethiopian Economy and the welfare of its citizens. Eighty per cent of the 83 million population live in rural areas and depend on agriculture. The agriculture sector accounts for ninety per cent of foreign currency and fifty per cent of gross domestic product.

Ethiopia is making a very significant policy commitment to agricultural driven economic development and food security. This is already underpinned by a large investment in agricultural extension, research and education. In Ethiopia, over recent years, there has been an explosion of innovative examples illustrating effective agricultural development with good linkages to domestic and international markets. A core aim of government policy is to 'scale up best practices'.

This report looks at innovation processes in the agricultural sector in Ethiopia. It includes lessons from recent success stories and focuses particularly on linking production with markets and agribusiness development. It also offers a wider context of current international thinking on and experience with agricultural innovation systems. The aim is to offer some insight into how Ethiopia's current system of agricultural extension, research and education could be further strengthened to meet the policy objectives. In particular, the focus is on how the system performance could be enhanced through capacity building of the various actors, and improvement of the institutional setting in which they operate.

As part of its engagement in the Agricultural Growth Programme (AGP), the Netherlands Embassy is interested in an assessment of the current state of affairs of the agricultural sector in terms of capacity building and knowledge management for enhancing innovation and business development.

This report complements the recent report by IFPRI and the Gates Foundation (Davis et al, 2010) on the public agricultural extension system. In particular it places public extension in a wider context of innovation systems and market development. The two studies do however reach similar conclusions about the challenges facing agricultural extension and the recommendations from both studies are broadly coherent.

## *Agricultural Innovation Systems and International Examples*

As a context for assessing the Ethiopian situation and making recommendations for the Netherlands Embassy, the report reviews current international developments in agricultural research and extension. It also draws experiences from Tanzania, Mozambique, Rwanda, Ghana, and South Africa.

Over the last decade there has been a shift towards conceiving agricultural research and extension in terms of 'innovation systems'. Innovation means putting a new idea or a new technology into use. An invention, new piece of scientific knowledge, a creation or a new product becomes an innovation when it improves how things are done, is economically viable to adopt and has a significant impact in its area of application.

An innovation system is a network of organizations, enterprises, and individuals focused on bringing new products, new processes, and new forms of organization into economic use, together with the institutions and policies that affect their behaviour and performance. An innovation system involves a much broader set of actors than just public research and extension institutions. In innovation systems thinking there is a particular focus on how the relationships between different actors enable innovation and learning.

The report looks at the relationships between innovations systems, value chain development, rural livelihoods and institutional change for market oriented development.

A key insight from both the Ethiopian experience and current thinking on innovation systems is the importance of innovation brokering. This is the role of bringing different actors together from across the public, private and NGO sectors to jointly solve problems and to create an environment of trust in which innovation can flourish. Innovation brokers need a particular status and set of knowledge and skills to effectively carry out this role. Furthermore, they generally need to be seen as working for the overall good of a particular sector or value chain.

### ***Emerging Issues and Opportunities***

From the interviews, case studies and literature reviews the following emerging issues and opportunities were identified that have implications for the implementation of the Economic Transformation Programme and the Agricultural Growth Programme.

***Positive Examples of Innovation:*** There are many positive examples of agricultural innovation, both technological and institutional to be found in Ethiopia. This report documented 21 such innovations (see Appendix 1). These were captured by asking those interviewed what they considered to be the best examples of innovation in the sector. The examples cover the Oromia and Southern Nations, Nationalities and Peoples Regions which were the focus for this report. These examples offer an insight into innovation dynamics and illustrate the value of learning lessons from such experiences. In most of the examples, the strong driving role of market incentives and the importance of individuals and organisations that play a 'brokering' or coordinating role was notable.

***Evolution of Marketing and Supply Chain Services:*** Government policies and emerging economic circumstances are creating the conditions for a much more market oriented approach to agricultural development. This complements a historical focus on food security where more attention was given to direct production aspects. Currently, there is much emphasis on development of entrepreneurial activity by both farmers and local enterprises, the latter who can add value and provide input supply and market services. However, to fully realise the policy objectives, more capacity and understanding of market and value chain development is needed across the agricultural research, education and extension system. Furthermore, there is a need to strengthen the role of private sector players and support a more plural service sector to enable a wider scale uptake of market driven approaches.

***Differentiation in the Sector:*** The agricultural sector in Ethiopia is very diverse due to differences in agro-ecology, social, infrastructure and marketing factors. The public agricultural, research and extension services at federal and regional level focus on support for male and female smallholders across the country. Differentiation in intensity and diversity of service delivery is based on the agro-ecological zone concept and its potential, as well as some main commodities, rather than on different categories of farmers. In terms of the capacity of small-scale farmers to engage in market linked entrepreneurial activity, there is a need to better understand which farmers have the capacity and assets to do so and which do not. The livelihoods framework can be of value in this regard. It is also important that local innovation systems are tailored to local conditions and operate flexibly and dynamically in relation to the capacities and assets of local farmers. This requires a thorough understanding of the interest and incentives for individual farmers and cooperatives, the ecology in which they operate and the market opportunities. Learning from local innovation processes is instrumental in this regard.

***Understanding of Market Driven Approaches, Innovation Systems and Processes:*** Many of the people interviewed said that they felt an attitude change was needed in how agricultural development is understood. There remains a strong perception that agricultural innovation predominantly involves developing and having farmers adopting new technologies that will increase yield. The concept of agriculture innovation systems, as briefly explained above and articulated in Chapter Two of the Report is not well understood across the agricultural education, extension and research institutions. This is

understandable as the agricultural education curriculum has historically focused largely on technical capacities for production and not on the capacities needed to develop new markets and coordinate agricultural value chains. It should be noted that a new Dutch funded Niche Programme is addressing this specific gap.

***Drivers of Innovation:*** The growing Ethiopian economy, combined with emerging export demand presents many opportunities for market-oriented agricultural development. As illustrated by most of the case studies, market linked/value chain oriented agricultural initiatives are flourishing. In these cases the driver of innovation and agribusiness development is the market opportunity. Although technological production capacity is a critical component, evidence suggests that to achieve a rapid up-scaling of current successes reforms are required in the institutional setting, to ensure a more market driven approach to agricultural innovation and development. Up to now, the existing agricultural research and extension system remains predominantly focused on technology development and enhancing productivity at farm level.

***Linkages between Key Players:*** The interviews made with the different players involved in innovation illustrate the fragmentation in the knowledge systems in general, but particularly at a local level (woreda and kebele). Mechanisms for coordination have been formed at regional and zonal levels and are planned at woreda level. Lessons from these platforms illustrate the importance for coordination but there remains a limited role in facilitation of innovation processes. The current platforms have been largely government instituted with a major dominance of the public sector. More open, transparent and flexible mechanisms are needed, based on interest rather than duty to ensure a stronger coordinating role with market players. The current separation between different ministries of the agricultural production functions and the marketing functions, as carried out by the unions and cooperatives was noted as a potential risk in further delinking production and market innovation. The emphasis in the AGP on coordination through ARDPLACS at all levels offers ample opportunity for strengthening linkages. The way in which this coordination role is executed is likely to have a significant impact on innovation processes in the sector.

***Innovation Brokering and Facilitation:*** Brokering of innovation networks and facilitation of innovation processes is a capacity which does not widely exist in the current extension setup. Some experiences are emerging through private sector, NGOs and donor supported initiatives. In general brokering and facilitation skills are weak, particularly at local levels. Nevertheless, it is increasingly realized by research and extension that such skills are needed if all relevant actors (e.g. market actors, and private service providers) are to be engaged in the innovation process. The lack of 'soft' skills was also a key issue raised by the IFPRI/Gates report. Recognition of the value 'free actor facilitators' (people or organisations who are perceived by others as having a relatively neutral position) is growing but still relatively limited. Research and university organizations as well as the corporate horticultural sector see potential for playing a greater role in this regard.

***Role and Capacities of Research Institutions:*** Investment in building the capacity of research organizations (EIAR, RARIs and Universities) has strongly focused on development of technical science capacity and infrastructural development, and less on social science knowledge and skills. Research organizations have proven to be strong in developing suitable technologies for agricultural production, but are less capacitated for value chain development, market analysis and supporting innovation systems approaches. Nevertheless, researchers are often successfully taking the lead in agricultural innovation processes, although the agricultural research for development (AR4D) principles are not fully mainstreamed. Given the interest and motivation of researchers, there is significant potential for research institutions to play a more active and diverse role within an innovation systems approach. This would however require upgrading of some capacities and the creation of a motivating funding and incentive structure.

***Role, Curriculum and Capacities of Education Institutions:*** Ethiopia has a strong foundation for agricultural education at both university and college levels and is producing a large number of graduates.

However, the capacities of these institutions are severely stretched in terms of physical, financial and human resources. The curriculum has remained largely of a technical nature, meaning that students do not adequately develop the marketing, innovation and 'soft' competencies that are increasingly recognised as an important complement to technical capacities. As a result, graduates do not necessarily develop the full set of competencies and practical experiences required for them to be fully competent in the positions they take on after graduation. There is a limited interaction between the education institutions and the research and extension system which further constrains the creation of opportunities for students to gain practical experience. There is wide recognition of these issues and a strong interest from both the government and the institutions themselves to strengthen the effectiveness of agricultural education and training.

***Role, Functioning and Capacities of Agricultural Extension:*** Agricultural extension is foreseen to become more decentralized, agribusiness and market-oriented, and farmer demand led in a change process as part of the AGP. This implies a key role for extension in multi-stakeholder processes for agricultural innovation. As yet public extension has not been heavily engaged in this role and has limited process management and facilitation capacity. Although curriculum change at ATVERTs is planned, this has not yet been fully developed and implemented. In implementing the AGP, fostering a public extension system that is able to flexibly respond to the dynamics of local level situations is critical. As clearly articulated by the IFPRI/Gates study (Davis et al, 2010), significant challenges exist within the current extension system in relation to field level resources, incentives structures and 'soft' skills of extension agents. However, the enormous scope of the extension system offers ample opportunity along with good examples of where it has been very successful.

***Incentive Mechanisms:*** The development of agricultural research, education and extension in Ethiopia has historically focused to a large extent on the development of human capacities with less attention given to the incentive mechanisms necessary for this capacity to be effectively deployed. Most dramatically this is seen in relation to the functioning of the farmer training centres. The capacity of a very large number of DAs (Development Agents) has been created through the work of the ATVERTs. However, at the field level, the incentives for the DA to stay in their position and to perform as expected are often weak. In addition, the incentives mechanisms for farmers to actively use the training centres are also not necessarily effective. Therefore, to create an effective market linked innovation system it is necessary to understand and manage the incentive mechanisms that drive the behaviour of the key actors in the system.

### ***Recommendations for Netherlands Support of the AGP***

Previous Dutch support for agricultural development in Ethiopia aligns well with the ambitions of the EGTP and the AGP and provides a good base of knowledge and experience in support of AGP's implementation. In particular, the Dutch support for value chain development initiatives, public private partnerships, innovation in seed supply and capacity development of agricultural education are important elements on which to build.

The Key areas of the AGP where the Netherlands may have most to offer are:

- Sub component 1.1 – Institutional Strengthening
- Sub component 1.2 – Scaling Up Best Practices
- Sub component 1.3 – Market and Agribusiness Development
- Sub component 3.2 – Monitoring and Evaluation

Overall it is suggested that the Netherlands would focus on supporting the AGP components which mainly depend on the development of knowledge and capacity building.

Based on the findings of this study, the following nine recommendations are made in terms of how the Netherlands Embassy could most effectively support the AGP. In Chapter Six specific options for consideration are given in relation to each recommendation.

**Recommendation One:** Promote and support an innovation systems approach to the overall implementation of the AGP.

**Recommendation Two:** Strengthen the facilitation and innovation brokering capacities of key public, private and NGO actors.

**Recommendation Three:** Support an AGP wide initiative that would identify and scale-up effective innovation processes, particularly related to best-fit strategies and complementing technical innovations with market and institutional innovation.

**Recommendation Four:** Combine direct Dutch support for the AGP with complementary activities that enhance innovation capacity and respond to market opportunities.

**Recommendation Five:** Contribute to the establishment of an effective monitoring and evaluation (M&E) system for the AGP.

**Recommendation Six:** Encourage the use of an integrated value chain approach in the implementation of the AGP and contribute to developing the required capacities of key players for this to occur.

**Recommendation Seven:** Support pilot innovation outreach programmes that strengthen linkages between research, education and extension and are linked with the work of ARDPLACS.

**Recommendation Eight:** Continue and enhance the support for capacity development of Universities and ATVETS with a particular focus on complementing technical competencies with those for marketing, agribusiness, facilitation and innovation brokering.

**Recommendation Nine:** Strengthen mechanisms for Netherlands-Ethiopia business and technical co-operation particularly related the dairy, horticulture, water and seed sectors.

## List of Abbreviations and Acronyms

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AGP	Agricultural Growth Programme
AIS	Agricultural innovation Systems
AKIS	Agricultural Knowledge and Information Systems
ARDPLAC	Agricultural Development Partners Linkage Advisor Council
ARTP	Agricultural Research and Training Project
AR4D	Agricultural Research for Development
ASARECA	Association for the Strengthening of Agricultural Research in Eastern and Central Africa
ATVET	Agricultural, Technical and Vocational Education and Training
BPR	Business Process Reengineering
CAADP	Compressive African Agriculture Development Program
CDI	Wageningen Centre for Development Innovation
CIP	Coffee Improvement Project
CTU	Change and Transformation Unit
DA	Development Agent
DFID	Department for International Development
EGTP	Ethiopia's Economic Growth and Transformation Plan
EIAR	Ethiopian Institute for Agricultural Research
EKN	Netherlands Embassy
EARS	Ethiopian Agricultural Research System
FARA	Forum for Agricultural Research in Africa
FCA	Federal Cooperative Agency
FRG	Farmers Research Group
FTC	Farmers Training Centre
HLIs	Higher Learning Institutions
IAR4D	Integrated Agricultural Research for Development
IFAD	International Fund Agricultural Development
IPMS	Improving Productivity and Market Success
LED	Local Economic Development
MOARD	Ministry of Agriculture and Rural Development
NARS	National Agricultural Research Systems
NEPAD	New Partnership for Africa's Development
PASDEP	Plan for Accelerated and Sustainable Development to End Poverty
PIM	Program Implementation Manual
RARIs	Regional Agricultural Research Institutes
RED-FS	Rural Economic Development and Food Security
REFLAC	Research Extension Farmers Linkage Advisor Council
RCBP	Rural Capacity Building Program
SDPRP	Sustainable Development Program to Reduce Poverty
SMS	Subject Matter Specialist
SNNP	Southern Nations, Nationalities and Peoples (region)
TOT	Transfer of Technology
WUR	Wageningen University & Research Centre
KIT	Royal Tropical Institute
EIAR	Ethiopian Institute of Agricultural Research
ARDPLAC	Agricultural Rural Development Partners Linkage Advisory Councils
PADTES	Participatory Agricultural Demonstration and Training Extension System



# 1 Introduction

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Ethiopia is making a very significant policy commitment to agricultural driven economic development and food security. This is underpinned by large investments in agricultural extension, research and education. Over recent years, there has been an explosion of innovative initiatives, which can serve as examples of effective agricultural development with good linkages to domestic and international markets. A core aim of government policy is to 'scale up best practices'.

This study on Strengthening Market Linked Innovation Systems was undertaken by the Centre for Development Innovation from Wageningen UR and the Royal Tropical Institute with support from two Ethiopian consultants who have extensive experience in the agriculture sector at the request of the Royal Netherlands Embassy in Ethiopia. The report offers a perspective on how innovation processes and capacities could be further developed in support of Ethiopia's Economic Growth and Transformation Plan (EGTP) and the Agricultural Growth Programme (AGP).

This report looks at the lessons from existing innovations as well as at the innovation process in Ethiopia and puts them in a wider context of current international thinking on and experience with agricultural innovation systems. The aim is to offer insight into how Ethiopia's current system of agricultural extension, research and education could be further strengthened to meet the policy objectives. In particular, the focus is on how capacities of different actors and institutions can be enhanced. The findings are based on interviews with over sixty people across the agricultural research, education and extension systems and an extensive literature review.

More specifically the study provides recommendations to the Netherlands Embassy on strategic priorities in supporting Ethiopia's agricultural sector development.

This report complements the recent report by IFPRI and the Gates Foundation (Davis et al, 2010) on the public agricultural extension system. In particular it places public extension in a wider context of innovation systems and market development. The two studies do however reach similar conclusions about the challenges facing agricultural extension and the recommendations from both studies are broadly coherent.

## 1.1 Background to this Assignment

For many years, the bilateral collaboration between the Netherlands and Ethiopia has been active in the agricultural sector in a range of initiatives varying from support to the Productive Safety Net Programme to strengthening the emerging horticultural sector. Within agriculture and rural development, increasingly two approaches have emerged that address the complex economic-biophysical nature of the challenges at hand: (i) the strong integration of policy, research, education and extension; and (ii) a value-chain approach.

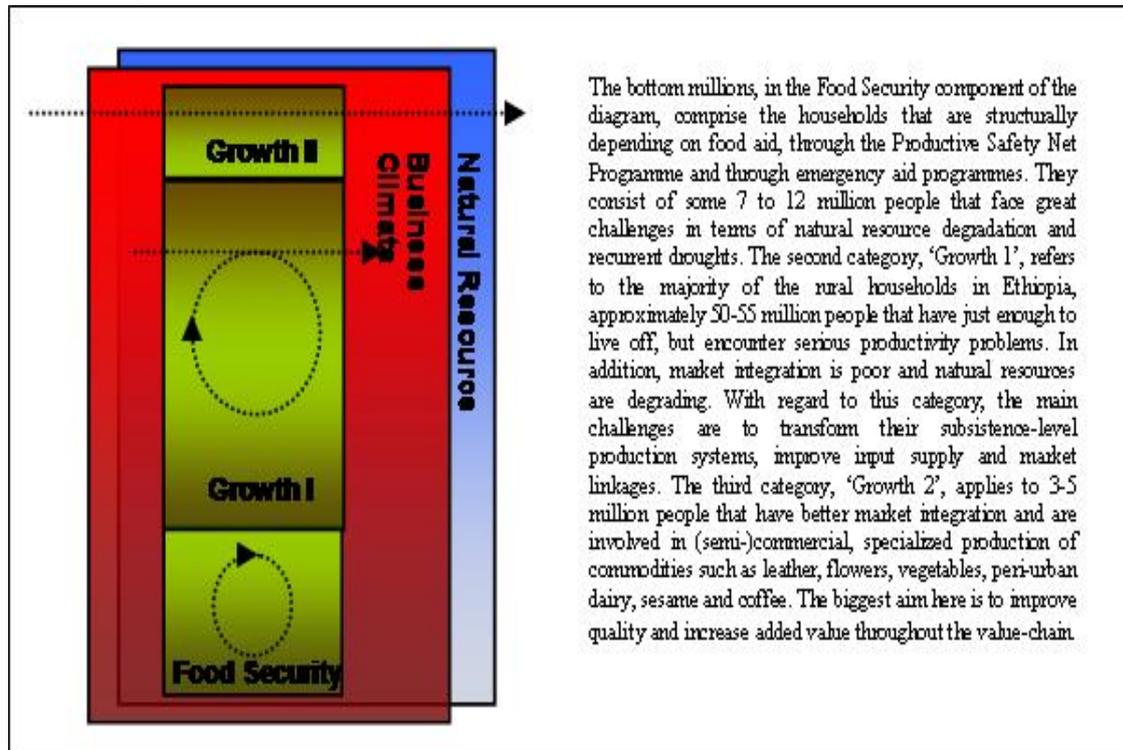
As part of its engagement in the Agricultural Growth Programme (AGP), the Netherlands Embassy is interested in an assessment of capacity development and knowledge management for enhancing innovation and business development in the sector and more in particular in relation to the growth I and II categories as defined in the working model<sup>1</sup> of the joint Ethiopian Government-Donor Sector Working Group on Rural Economic Development and Food Security (RED-FS) (see Figure 1).

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<sup>1</sup> The framework has been the basis for developing a national level strategic planning framework to guide the prioritization, planning and implementation of current and future public and development assistance investments in the context of the preparation of the next Five Year National Development Plan ("PASDEP II") *Source:* From the Cover Note To the Memorandum of Understanding Wageningen UR.

**Figure 1 Rural Household Categories in Ethiopia**

Source: RED-FS, 2010



Based on a deeper insight in the state of the art (scientific) thinking about innovation, development and adaptation in the agricultural sector, the Netherlands Embassy (EKN) requested an assessment study and formulation of recommendations for strengthening the Ethiopian agricultural knowledge Management System and its current programme for capacity building in extension and education. In addition, advice on potential areas of intervention for EKN and its engagement in the AGP's activities on knowledge management and capacity building was envisaged.

The report provides a basis for further development of EKN's approach and its strategic priorities in supporting development of the agricultural sector in Ethiopia. In addition, the report can be used in strengthening the operationalization and implementation of the AGP.

## 1.2 Global Context of Agricultural Growth and Development

After extensive period of declining investment and neglect, agriculture is back on the global agenda with renewed recognition that it is central to the challenges of poverty alleviation and environmental sustainability (WDR, 2009) . This has four main reasons:

One, for many poorer countries it has been recognised that development of a robust and profitable agriculture sector is a key step in overall economic development.

Two, in all countries with developing or transitional economies, a large proportion of the population is living in rural areas and in rural poverty, even if, as in the case of China for example, there has been significant development of the manufacturing and service sectors. As such, development of the agriculture sector remains a critical condition to enable (equitable) development and to tackle poverty.

Three, with a growing world population, an increasing demand for agricultural production and an emerging demand for biofuels, major concerns about overall global food security and food prices are arising.

Four, agricultural production can lead to climate change and climate change has a direct impact on agricultural production systems with potential high risks for food security.

The combination of these factors contributed to a new emphasis to agriculture. With a focus on agriculture as a driver of economic development, much more attention is now being paid to market linkages and how local agribusiness and entrepreneurship can be stimulated. This has given rise to the vast array of value chain initiatives supported by a broad range of donors, development organizations and agribusiness enterprises. There is also much attention emerging for the balance between the role of international, regional, national and local markets.

Particularly in countries with rapidly developing urban and middle class populations it is recognized that there are many opportunities to develop domestic markets. The penetration of supermarkets and increased coordination of supply chains has created a new dynamic related to requirements for quality and quantity with major implications for small scale producers.

### **1.3 Opportunities and Challenges for the Agricultural Sector in Ethiopia**

External factors have had a significant impact on the Ethiopian economy and its agricultural sector over recent years (World Bank 2010a). These included the high commodity prices, high fuel prices and the global downturn. This resulted in a dramatically higher value of imports, dramatically reduced international reserves, reduced private transfers and foreign direct investment, and also significantly lower GDP growth than expected. Goods consumed by the poor increased in cost by ~80% and some 7.5 million people are chronically food insecure.

Ethiopia has significant agricultural resources in terms of land, water and labour. Recent agriculture-driven growth has demonstrated that with the right conditions in place there is significant potential for market-linked agricultural development, both domestically and for export. Yields, in much of the sector, that are significantly lower than could be achieved with better agricultural practices also present a potential for increased productivity and greater food security.

The presence of the aforementioned resources and market potential have given rise to the focus on agriculture in the Government's Economic Transformation Programme and establishment of the Agricultural Growth Programme. These initiatives indicate the political commitment and resources for a major transformation of the agriculture sector.

The real economic benefits from agricultural development will come from development of local agribusiness, and the establishment of value chains for domestic and export markets. This calls for high degrees of entrepreneurship and the creation of enabling market conditions. Moreover, experience suggests that productivity increases are more likely to be driven by the pull of market incentives than by a production push.

This has significant implications for Ethiopia's agricultural research, education and extension system. While they have a long history, are well established and have received significant investments, they remain largely production oriented. To meet the ambitions of the ETP and the AGP this system will require strengthening and modernisation. In particular there is a need to focus on effective production-market linkages and processes of innovation that forge entrepreneurial partnerships between producers, agribusinesses, government institutions and supporting non-government organisations.

As this report will outline, the agricultural innovation systems perspective could offer an effective framework for responding to the challenges of and opportunities for the Ethiopian agricultural sector.

## 1.4 Approach used

In line with the terms of reference the main activities undertaken by the mission were: (i) Desk study on global developments on innovation processes in the agricultural sector, also based on a number of cases; (ii) Analysis of the policy environment for innovation processes in Ethiopia; (iii) Stakeholder and expert consultation in Ethiopia; (iv) compilation of a mission report and policy brief development.

For the stakeholder consultation the following groups of actors were interviewed in five key domains of the national agricultural innovation systems:

- (i) the Demand Domain (market and consumer parties);
- (ii) the Enterprise Domain (farmers, traders, processors and input supply companies);
- (iii) the Education and research Domain (Universities, Research Organizations in public and private sector);
- (iv) the Support structures (financial services, training support, infrastructure); and,
- (v) the Intermediary Domain (Extension services in public and private sector).

During the interviews special attention was given to fragmentation of the agricultural knowledge and innovation system. Three agricultural knowledge systems can be distinguished with possible interactions:

1. Agricultural knowledge system in which the public sector dominates, and which focuses on smallholder farmers. Main actors are apart from the public sector, the farmer cooperatives.
2. Agricultural knowledge system with a major role for national and international NGOs, still focusing on smallholders and medium-scale farmers.
3. Agricultural knowledge system dominated by the large export oriented corporate farms, often in the horticultural sector.

The level of interaction and learning between the three systems was analysed. The various actors were asked to present examples of innovation, the institutional histories and mechanisms that made the innovation possible, as well as their role in the innovation process. A list of some 21 innovation examples in the agricultural sector has been presented in Appendix 1.

## 2 Agricultural Innovation – Conceptual Foundations

Over the last decade there has been a move towards conceiving agricultural research and extension in terms of ‘innovation systems’ (cf WB, 2006, Hall, 2008, Berdegue, 2005). This involves a shift from seeing innovation as a process of linear technology transfer to seeing it as an interactive process of two way learning and exchange between all the different actors.

Six changes in the context for agricultural development heighten the need to examine how innovation occurs in the agricultural sector (World Bank 2006):

1. Markets, not production, increasingly drive agricultural development.
2. The production, trade, and consumption environment for agriculture and agricultural products is becoming more dynamic and evolving in unpredictable ways.
3. Knowledge, information, and technology increasingly generated, diffused, and applied through the private sector.
4. Exponential growth in information and communications technology has transformed the ability to take advantage of knowledge developed for other purposes.
5. The knowledge structure of the agricultural sector in many countries is changing markedly.
6. Agricultural development increasingly takes place in a globalized setting.

### 2.1 Defining Innovation

Innovation means putting a new idea or a new technology into **use**. An Invention, a creation or a new product only becomes an innovation when it improves how things are done, is economically viable to adopt and has a significant impact in its area of application (Berdegue 2005).

Scientific research and technology development are often confounded with innovation. However, before a new variety, a new cropping system, a new idea about microfinance or a new technology for tracking products can be considered an innovation, it has to be effectively adopted. As such, innovation requires not only creation or introduction of a new idea or technology but also creating the conditions so it can be effectively adopted and used.

Further, an innovation is a new way of doing things for a particular group, organisation or business. The fact that the idea is already known by others does not stop it being an innovation for the group adopting it.

### 2.2 Integrating Technological and Institutional Innovation

Over the last decade agricultural development has been shifting its main focus from production issues to giving much more attention to development of markets and the creation of effective value chains. Agricultural productivity and technical capacities remain critical. However, if there is no market demand or the market is not effectively connected to producers through efficient value chain mechanisms, there is often no incentive for improving agricultural productivity.

Creating effective and efficient marketing mechanisms and value chains requires combining technological innovation with institutional innovation. Institutions are the ‘rules of the game’ that shape the way humans behave and the way markets operate. They include government policies and regulations, taxation arrangements, coordination mechanisms between different actors in markets, informal rules between market players, and arrangements according to which financial, marketing, communication for transport services are to be provided (Woodhill 2008).

It is increasingly recognised that inappropriate institutional arrangements are often the major barrier to effective development and to tackling the underlying causes of poverty and unsustainable resource use.

Key areas for institutional innovation include: developing and meeting food quality and safety standards; introducing traceability into the value chain; creating effective producer organisations; establishing stakeholder learning and coordination mechanisms; changing agri-food businesses procurement policies; establishing mechanisms for public private investments in market infrastructure.

Institutional innovation can require a different research and development pathway than technological innovation. In particular, institutional innovation is even more dependent on effective coordination and multi-stakeholder engagement. Historically much of the agricultural research and extension capacity and infrastructure has been oriented towards technology development and limited attention was paid to institutional development. By now, the awareness is growing that the latter is at least equally important, if not more decisive for the generation and spread of innovations.

## 2.3 Market Driven Innovation and Value Chains for Agricultural Development

A value chain approach to agricultural development looks at how market opportunities, at local, national or international levels, can be developed and linked with producers. This involves assessing the whole value chain to improve its efficiency and to find ways of ensuring that small-scale producers can meet the market requirements and benefit fairly from participating in the value chain. All actors along the value chain may benefit from the advantages gained by application of this approach.

Often, small-scale producers are not very well situated to benefit from emerging market opportunities. Wholesalers and retailers are moving towards direct partnerships with producers, who can guarantee the provision of a steady supply of produce complying with the quality criteria and volumes required, which can shorten the value chain.

For small scale producers to engage in and benefit from new market opportunities they need to be able to bulk up their produce and ensure quality standards. This requires effective producer organisations and enhanced capacities.

To respond to this new environment, traditional agricultural research and extension services that focused mainly on production capacity need to complement their services with a set of new functions and services that include:

- conducting market analysis;
- supporting small-scale farmers to get organised into producer organisations;
- introducing quality assurance mechanisms;
- assisting producers to see and understand market opportunities and demands;
- brokering relationships and communication between different actors in the value chain;
- ensuring access to financial services that align with market demands;
- providing business development services; and
- developing systems to supply market information.

Figure 2 illustrates the value chain, the actors directly or indirectly involved along the chain, the factors influencing the behaviour of the actors, and the dynamics of the process. The top layer shows the main elements of the value chain. The middle layer shows the network of actors along the value chain and illustrates that within the network of actors, there are flows of inputs, products, finances and information.

The lower layer shows the institutional factors that influence how the chain functions and the incentives for different actors.

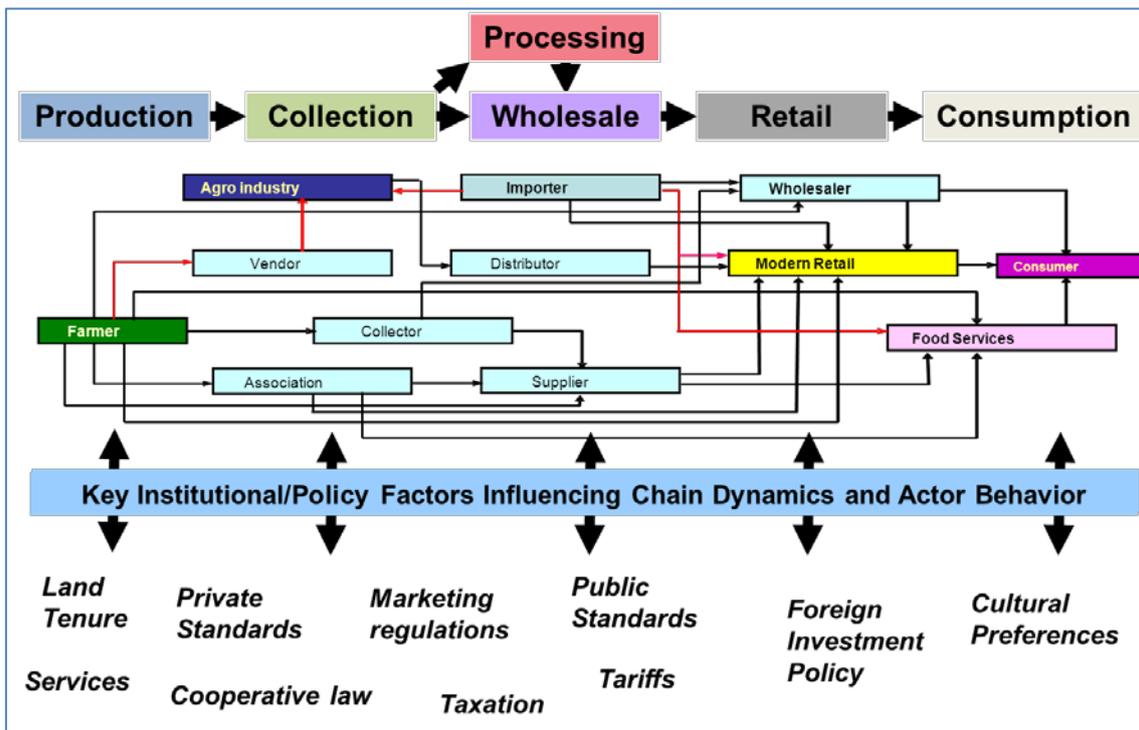


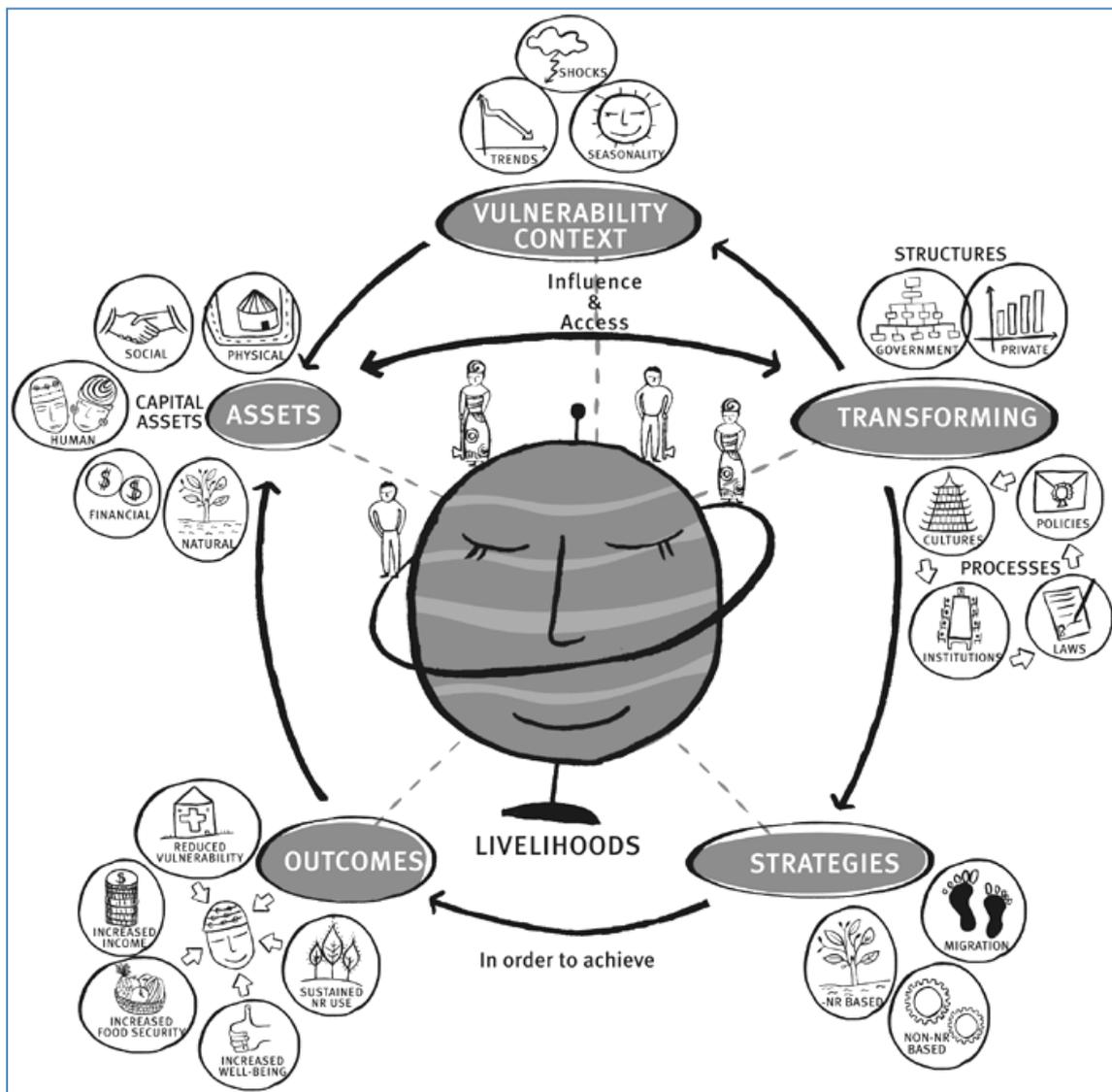
Figure 2 Illustration of a value chain showing institutional factors that influence its functioning

Source: Vermeulen et al., 2008

## 2.4 Livelihood Assets and Innovation

Apart from the growing interest in innovation systems and value chains, the livelihoods approach (DFID 1999) also has gained increased attention over the last decade. This approach, see Figure 3, focuses on all the assets (capitals) local people need to develop the resilience of their livelihoods to deal with changes in the social, economic and environmental conditions they live in. Five assets are generally recognised:

1. Physical – infrastructure; housing; processing equipment; transport
2. Social – community organisation; producer organisations; trust and support networks, governance, rules and regulations, services
3. Financial – income, earnings, savings, investments, access to credit and other financial services; insurance
4. Natural – possession, usufruct, access to land, water; minerals, breeds, seeds, vegetation
5. Human – labour; knowledge skills and attitude; leadership



**Figure 3 Illustration of the livelihoods framework**

*Source: FAO (2006) after DFID (1999)*

It has been recognised that it requires an integrated approach to strengthen livelihoods in all these assets to tackle poverty effectively. Often, the lack of success in the development of value chains is due to the fact that insufficient attention is paid to developing all these assets which are essential for producers to effectively participate in the value chain.

## 2.5 Scaling Up

A key question for the development of interventions is how to ‘scale-up’ successful interventions in order to have a wider impact. The issue of up-scaling is central to the AGP. Ways have to be found for specific interventions to have an impact beyond their immediate focus. However, the scaling up challenge is not as easy as it may seem. A defining feature of agriculture is the enormous differences between different locations in terms of agro-ecological conditions, production and market opportunities, services,

infrastructure, human capacities, culture, etc. This means that a technology or institutional change that worked well in one location will not necessarily work well in a different location.

Across the development sector there is a growing interest in the implications of complexity thinking. Recognising complexity means recognising that there are so many variables or factors influencing a situation that it is very hard to know exactly what will happen as a result of an intervention. This calls for a shift from top down linear planning to forms of interventions that are more dynamic, learning-oriented and adaptive. Easterly (2006) makes a distinction between planning and searching. He argues that too much of development has focused on ordered planning when in fact what is really required is much more entrepreneurial searching, which in essence implies responding to opportunities as they emerge.

The diversity of agriculture combined with accepting the complexity of development has significant implications for the idea of scaling up. In short it means that scaling up should not focus on 'best practices' that are widely promoted, but rather on 'best fits' - taking experiences and lessons from other places and modifying and adapting them to create 'innovation' in a new location.

It needs to be recognised that when a new technology has been successful in a particular location the technology itself is often only part of the story. A whole set of institutional factors, approaches and incentives help to create the conditions for success. Trying to scale up the use of a technology without the complementary institutional conditions will often fail. For example, in the Holeta area of Ethiopia, farmers have been successful in developing and growing new varieties. However, behind this technological dimension lies a significant social and economic infrastructure of farmer groups and financing mechanisms. Simply promoting the new varieties to other farmers without this institutional enabling environment is unlikely to have an impact.

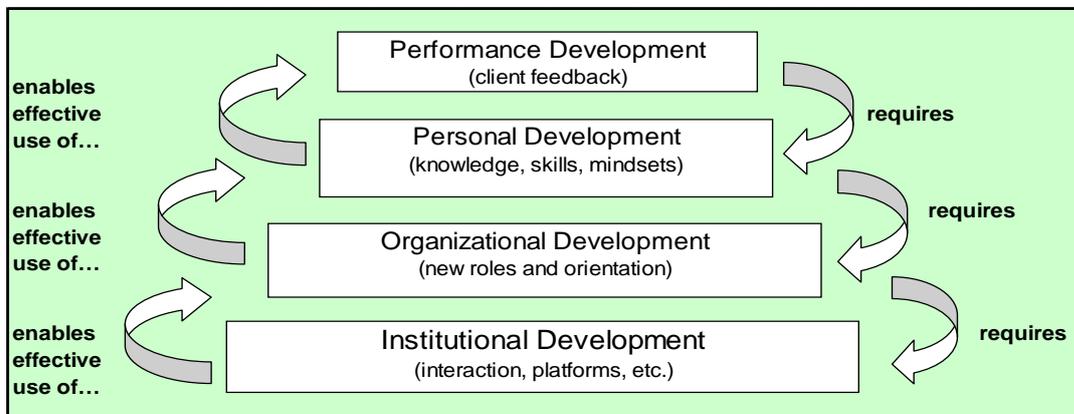
The aforementioned remarks have major implications for how to go about scaling up and for the competences required from researchers, farmers, extension staff, development planners and policy-makers alike. For scaling up in diverse, complex and rapidly changing contexts, all these actors cannot do without an innovation systems perspective.

As a result of decentralization and participatory approaches, the extension advisory services will be increasingly provided by a diversity of government, private sector and NGO actors. According to the specific institutional context in the various countries, the public sector and the private sector, as well as civil society organizations may each play a particular role in the innovation system. Many innovations will develop, both at technological and institutional level. The system requires a mechanism to learn from new, often very local experiences, i.e. a monitoring and learning facility. This learning from local practices and experiences will be a major task for the management of extension at national and regional level, and will have to be open for experiences from both public and private sectors involving all key innovation system stakeholders. In such a setting, identified and documented good local practices can be considered for use on a wider scale through a carefully designed scaling-up strategy. Up-scaling can be about quantitative aspects of more farmers adopting or adapting technologies to their own situation, but it may also refer to policies and institutional and organizational dimensions. Based on innovation system concepts, the factors of success of up-scaling good practices need to be analysed *ex ante* (Zalf, 2010). Scaling-up efforts need to be carefully monitored and periodically evaluated. Capacity to guarantee such close supervision is scarce, but at the same time an essential component in the innovation systems approach.

## 2.6 Capacity Development

There is renewed attention for capacity development. For example, the 'Accra Agenda for Action' was strongly directed towards the need for enhanced capacity development. It stated that: 'without robust capacity—strong institutions, systems, and local expertise—developing countries cannot fully own and manage their development processes' (OECD 2008).

On the other hand, it also needs to be recognised that large scale training programmes often fail to create capacities. Consequently there is now attention for more integrated approaches to capacity development that look at how individual, organisational and institutional aspects link together to enable effective performance.



**Figure 4 Integration of capacity development at individual, organizational and institutional level**

Source: Adapted from Potter and Brough, 2004

## 2.7 Innovation Systems and Processes

The concept of *innovation systems* has evolved over time and is being built on developments such as farming systems research, participatory technology development, participatory learning and action/participatory rural appraisal, agricultural knowledge and information systems (AKIS).

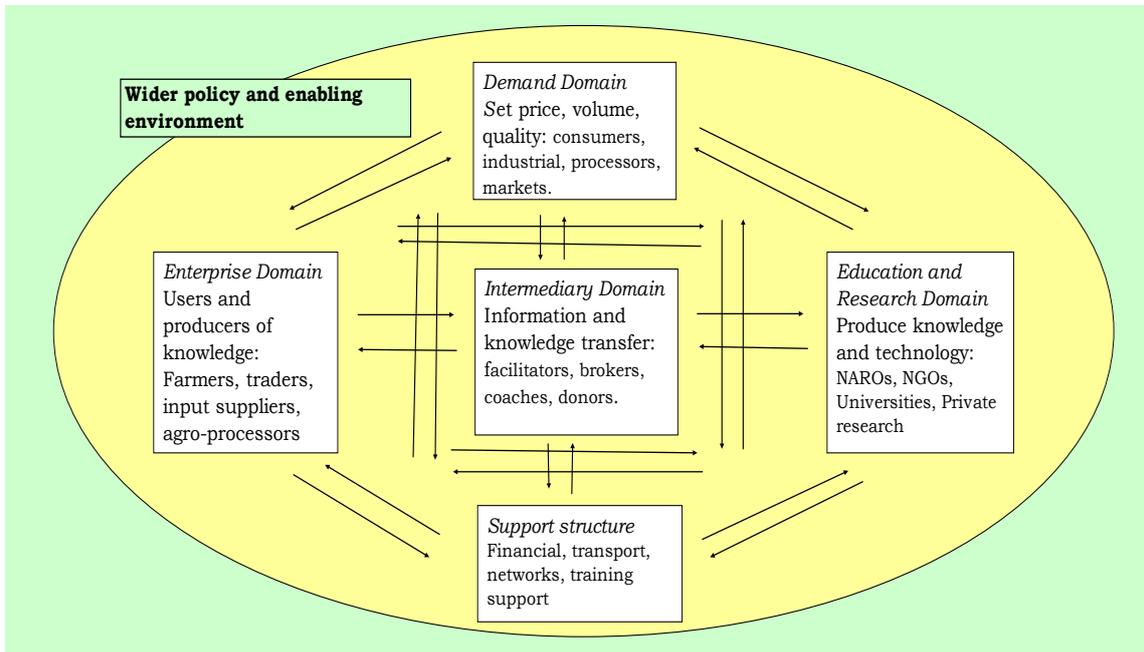
The articulation, background and rationale of an innovation systems approach is well captured in the World Bank's 2006 publication on "Enhancing Agricultural Innovation: How to Go Beyond the Strengthening of Research Systems". This publication was the result of an international workshop on "Development of Research Systems to Support the Changing Agriculture Sector". The concept has also been well articulated by authors such as Hall (2007, 2008), Spielman (2005), Berdegue (2005).

The World Bank (2006) publication defines an innovation system as: "a network of organizations, enterprises, and individuals focused on bringing new products, new processes, and new forms of organization into economic use, together with the institutions and policies that affect their behaviour and performance. *The innovation systems concept embraces not only the science suppliers but the totality and interaction of actors involved in innovation.* It extends beyond the creation of knowledge to encompass the factors affecting demand for and use of knowledge in novel and useful ways."

The essence of this definition is presented in Figure 4, which illustrates that innovation occurs through the interaction between the different domains of market demand; agri-food enterprises; service and support mechanisms; research and education and in the centre the domain of intermediaries who help to broker innovation.

**Figure 5 Simplified representation of an innovation system with key stakeholder domains**

Source: CTA/UNU-Intech/KIT, 2005



According to Hawkins et al, (2009), four key principles are important for an innovation systems approach:

- (i) developing a joint agenda between key stakeholders in the innovation system;
- (ii) organizing the facilitation of the multi-stakeholder learning process;
- (iii) assessment of the effects and outcome of the process on the different actors in different dimensions; and
- (iv) development of ex-ante scaling up strategies, including institutional and policy aspects.

The innovation process is the process that leads to innovation, it is dynamic and often unpredictable and not linear, it is about the combined knowledge of the many actors in an innovation system. A simplified example is the bringing together of farmers' knowledge (often undocumented indigenous knowledge), research knowledge (e.g. on new market-oriented technologies and the market knowledge (on quality, consumer demands etc.)), which are all needed to make something happen. This process often needs bringing the relevant actors together (brokering), as well as guiding the interaction (facilitation and coaching). These brokering, facilitation and coaching services are important for effective and dynamic innovation systems.

As a summary, Figure 6 illustrates an integrated perspective on different areas for innovation given the above conceptual overview of an innovation systems perspective. The figure illustrates the connection between local production and value chains. The importance of considering the peoples overall livelihood strategies and capitals as a precondition for engaging in market linked entrepreneurial activity is key to the perspective. Emphasis is also given to the opportunity for developing local agribusiness initiatives (clusters) where a combination of local value adding, bulking and service delivery leads to off farm economic development. Also illustrated is the need to support improved service delivery for all stages of the value chain and for creating the enabling institutional and policy environment. Ultimately the opportunities for small-scale producers are influenced by consumer demand and the factors influencing this.

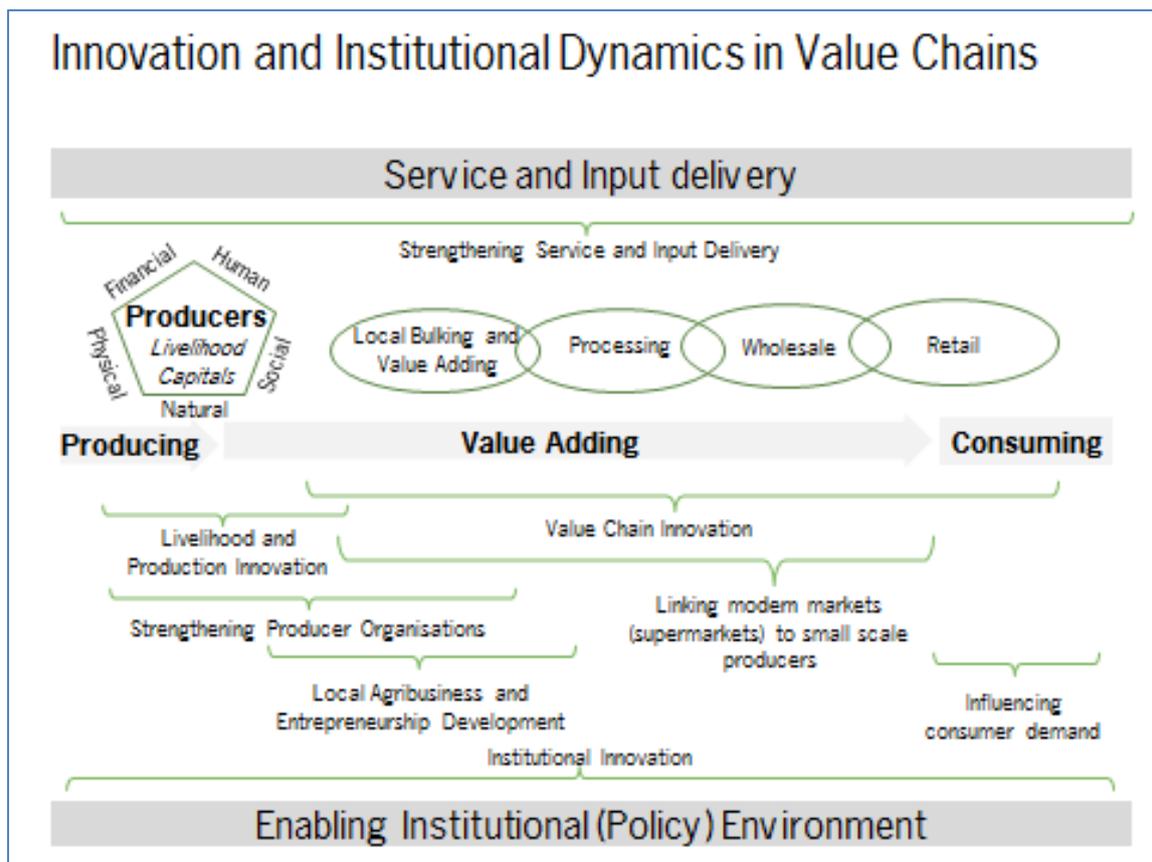


Figure 6 An Integrated Perspective on Market Linked Agricultural Development

## 2.8 Innovation Brokering

Within the innovation systems approach there is increasing recognition for the importance of innovation brokers. These are individuals or organisations that help to create space for innovation by bringing different actors and ideas together and creating linkages that otherwise would not exist. This brokering role is complementary to the traditional agricultural extension role which has often focused more at the farm level and on technology transfer. Innovation brokers work across scales, even helping to make linkages between foreign markets and local producers. They need to be highly knowledgeable of the sector, have trust and respect from the different players and be able to communicate across the boundaries of business, government, producers and NGOs.

## 3 Agricultural Innovation – A Global Perspective

### 3.1 Evolution and Implementation of an Innovation Systems Perspective

In agricultural research and development, the innovation systems perspective has gradually been introduced, evolving from earlier systems thinking such as in farming systems approach, livelihood systems, to the more comprehensive innovation system. The innovation system concept itself evolved from the National Agricultural Research Systems (NARS) involving all stakeholders in agricultural research, to Agricultural Knowledge and Information Systems (AKIS), involving all codified knowledge actors in the system, to Agricultural Innovation Systems, involving all actors needed for innovation expanding the system with tacit knowledge actors (Chema et al., 2003). Innovation thinking has also recognized that markets and policies are often the key triggers for innovation, and not just research and/or extension. The Transfer of Technology (TOT) approach still has a place but there is increased awareness that research and extension are not as central to innovation processes as once assumed.

#### **Box 1 Integrated Agricultural Research for development and innovation systems**

The Forum for Agricultural Research in Africa (FARA) proposed the Integrated Agricultural Research for Development (IAR4D) as an innovation system framework that should form the base upon which transformation of agricultural research in SSA should be considered. The IAR4D concept aims to deviate from the traditional linear configuration of ARD by encouraging the engagement of multiple actors along the commodity value chain to promote the innovation process in agriculture. In IAR4D, innovation evolves through continuous interaction among players, utilisation of feedback, analysis and incorporation of lessons learned between different processes. This essentially draws on the knowledge of relevant actors in each stage. The framework creates a network that to reduce technical, social, and institutional constraints to create an environment that facilitates learning with the ultimate aim of generating innovation rather than mere research products or technologies. IAR4D cannot but be complex, and would certainly require fundamental changes in the wider institutional and policy environment in order for it to promote the process of innovation.'

*Source: Monty Jones Executive Director FARA*

Innovation systems thinking in research has been introduced through the Integrated Agricultural Research for Development (IAR4D) concept. IAR4D is based on a set of principles and is not a blue print or model. It is being operationalized by a large number of key actors and policy makers. FARA has adopted the concept for its programmes (SSA-CP) and presented an overview of IAR4D principles, tools and references ([Hawkins et al., 2009](#)).

ASARECA (Association for the Strengthening of Agricultural Research in Eastern and Central Africa), of which Ethiopia is a member, has adopted the IAR4D principles in its programmes ([Heemskerk et al., 2007](#)), notably through the CGS (Competitive Grant Scheme). A study commissioned by ASARECA analysed the state of affairs in implementation of the IAR4D principles in the CGS programme in six countries of the ASRECA region, including Ethiopia . The main conclusions for Ethiopia were on the unclear leadership in innovation processes, the role of the private sector and the role of farmer organizations in regional and national fora. At the same time, trends towards more demand driven research and involvement in multi-stakeholder processes were observed. Policy concerns were raised on the priority given to process facilitation and the funding made available for such processes (Heemskerk, 2007).

The IAR4D principles and the innovation system perspective have been further boosted in Africa by the IAR4D capacity building programme by ICRA (including a large programme in Ethiopia) and the Innovation Africa Symposium, as well as Agricultural Science Technology and Innovation training programme of CTA.

## 3.2 Changing Approaches to Extension and Service Delivery

The Agricultural Knowledge and Information Systems (AKIS) framework (FAO/WB, 2000) highlights the need to coordinate agricultural extension with agricultural research and education. Building on this, the Agricultural Innovation System (AIS) framework makes a case for the need to see agricultural extension as part of “a network of organizations, enterprises, and individuals focused on bringing new products, new processes, and new forms of organization into economic use, together with the institutions and policies that affect their behaviour and performance” (World Bank, 2006). This leads to major changes in agricultural extension systems: more emphasis is given to decentralization, market-led development and demand-orientation. Some of these main principles for such type of extension are being mainstreamed by the World Bank (Agricultural Innovation System Source Book, In press, 2011).

Local governments are being empowered to run their own affairs. It is becoming common for district governments and administrations to operate a budget obtained from the treasury, allocated on the basis of an integrated district development plan and/or formula. Publicly-financed advisory service systems are increasingly planned, financed, implemented, and coordinated at the district level. The meso level (provinces and regions), also coordinates, and implements crosscutting services (mostly on contracts) e.g. seed services, environmental management services, food security services, and general crosscutting services (beyond district boundaries). The national level plays a supportive and backstopping role for all service providers and provides the enabling environment with policies, strategies, and regulations.

Extension managers and partners recognize that service provision can improve in quality through performance contracts, which need to be based on comparative advantage by the public and the private, sector and civil society. Every situation can come to the best fit mix of services, depending on demand and availability of services. Agricultural advisory services are partnering with other actors in the innovation system. For example, partnerships could be concluded between private providers of advisory services and agricultural research institutes, agricultural chambers of commerce, micro-finance organizations, and agro-processing manufacturers. Local governments (districts, communes, etc.) are contracting service providers who provide the services required, oriented by direct farmers' demand in the context of district agricultural development plans and based on comparative and competitive advantages and leading to synergy and complementarity. Notably the need for local services for business development is emerging as a priority which, in general, is hardly addressed by public extension systems.

Farmers' organizations represent the voice of the clientele, but are also partners in extension, in terms of planning, resource allocation, monitoring and evaluation (M&E) and service provision. Empowerment is twofold; economic empowerment (in value chains and Local Economic Development (LED)) as well as an enhanced role in priority setting in planning and service provision. In a pluralistic system, downward accountability is more important for quality control.

The extension approach is changing from the top-down system with blanket production-oriented recommendations toward a more interactive learning approach with room for differentiation in categories, messages, and approaches. The extension officer will play a more facilitating role, but still rooted in his/her technical background, stimulating learning among farmers (as in farmer field schools) and with other actors, in particular market actors.

## 3.3 Strengthening Producer Organisations

Smallholder farmers require collective action in order to fully participate in the innovation system through economic empowerment and enterprise development, financial empowerment as well as for influence on the context for the development of their livelihood system. This requires investment in producer organizations, farmer based organizations and/or cooperative enterprises, rural savings groups and credit

associations, as well as higher level farmer organizations for lobby and policy influencing. The interaction between the three aforementioned categories of farmer organizations, is considered important for smallholder agricultural development.

Through district platforms (Farmer Fora), farmers and their local organizations are involved in establishing the agenda for agricultural development as well as in decision-making on the kind of investments and services needed ([Heemskerk et al., 2008](#)). Also, farmer organizations are increasingly getting involved in actual service delivery, particularly concerning extension and advisory services embedded in input supply, as well as in Farmer Field Schools and Farmer Business Schools.

Apart from a national lobby function, national farmer organizations and networks can also play a role internationally (e.g. East African Farmers Federation and the International Federation of Agricultural Producers). Rural Savings and Credit Cooperatives are bridging into Cooperative Banks, while Cooperative Enterprises are forming Cooperative federations in order to optimize input and output marketing ([Nederlof et al., 2007](#)).

### 3.4 Value Chain Development

In general, development of value chains is about innovation in the chain to enhance the value-added for the benefit of all actors.

Two basic strategies can be used by groups of smallholder farmers to improve their incomes: vertical and horizontal integration. Vertical integration means taking on additional activities in the value chain: processing or sorting and grading produce, for example. Horizontal integration means getting more involved in management of the value chain itself – by farmers improving their access to information and know-how of the markets, their information management, the control over contracts, or cooperation with other actors in the chain (KIT/Faidha Mali/IIRR, 2006).

Smallholder farmers can face serious difficulties selling their produce. Farmers, along with development agencies and governments, treat the traders who market their goods with suspicion and mistrust. Traders struggle to run their businesses in the face of adverse policies and attitudes. With more respect and support, they could develop markets, add value to products, invest in new businesses, and improve the efficiency of the food distribution system. They could generate demand for farm products and help improve the incomes and livelihoods of rural people (KIT and IIRR, 2008).

Small-scale farmers, traders and processors are often constrained in their business operations due to a lack of finance. Farmers want to be paid immediately, but traders do not have the ready cash to buy their produce. Traders need working capital so they can buy and transport produce, but lack the collateral to get loans. Processors cannot get the money they need to buy equipment or ensure a steady supply of inputs. Value chain finance is a solution to such dilemmas. Value chain finance is an arrangement in which specialized financial institutions are linked to the value chain offering services that build on the business relations in the chain. For example, a bank may loan money to a trader because the trader has a regular supply of produce from a farmers' group and a supermarket as a loyal customer. When lead firms are willing to vouch for their suppliers, even smallholder farmers become creditworthy.

Over recent years a significant investment has been made by many different development organisations and donors to support a variety of multi-stakeholder initiatives aimed at 'chain-wide learning'. A guide on this topic was produced as part of the global Regoverning Markets Programme (Vermeulen et al 2008). Linked with Dutch initiatives has been a learning alliance in Ethiopia and the Agri-ProFocus network that works Africa wide.

## 3.5 International Examples

### 3.5.1 Extension systems changes

In many African countries the extension system as an intermediary in the agricultural innovation system is undergoing major changes in the post Training and Visit era. Extension is now mostly referred to as advisory services, which comprise a wider spectrum of services than the traditional extension services, extending knowledge from research to farmers. Recently major emphasis is being given to changes in extension systems in international studies, based on experiences in many countries (Swanson and Rajalahti, Christoplos, Davis and Heemskerk). This has also been triggered by the recognition that extension in the role of facilitator of knowledge sharing, dissemination and learning process is an essential component of innovation systems. New networks have recently been emerging in both Africa (AFAAS, [www.afaas-africa.org](http://www.afaas-africa.org)), Latin America (see [www.rimisp.org](http://www.rimisp.org) emerging network since 11/2010) and Asia (emerging since 11/2010). The recently established Global Platform on Rural Advisory Services (GFRAS) is rapidly becoming a leading facilitator in advocacy for the new role of advisory services in an innovation system perspective ([www.gfras.org](http://www.gfras.org)).

The change focus is on: (i) demand-driven services through farmer empowerment and partnership development; and, (ii) market-oriented services, both in terms of produce marketing as well as in service delivery.

A worldwide extension study, commissioned by the Global Forum on Rural Advisory Services (GFRAS), on the state of affairs of agricultural extension in developing countries can be followed on: <http://www.worldwide-extension.org>. This database is expected to become similar to the one for research, i.e. the ASTI database <http://www.asti.cgiar.org/data>.

### 3.5.2 Demand-driven services

The demand focus involves institutional changes such as bringing extension services closer to the farmers in order to improve interaction and downward accountability, which means decentralization of priority setting, planning and resource allocation and decentralization in service provision to the lowest level possible based on the subsidiarity principle.

#### **Box 2 Tanzania: Decentralized pluralist market-oriented research and extension system**

The Agricultural Sector Development Strategy aims at transforming the smallholder agricultural sector from subsistence to commercial agriculture and led by the private sector and facilitated by public-private partnership service provision. In order to achieve this the public extension system has been decentralized to the district level, and district administration manages a budget for agricultural development. This extension budget is part of the overall budget but ring-fenced and destined for extension. Farmers have a say through the district level farmer fora over the resource allocation and the procurement of suitable services whether public or private. De-concentrated research at zonal research centers will support this agricultural development at district level. To that extent the client-oriented research and development management approach, which is based on the multi-stakeholder innovation systems perspective, is mainstreamed in the Tanzania research system. Funding for research and extension has been delinked from actual implementation allowing control of resources by beneficiaries. This is partly achieved by Zonal Agricultural Innovation Funds managed by multi-stakeholder committees. Privatized research and extension service provision on commercial commodities (coffee, cashew, cotton, etc.) is managed and funded by the corresponding sector based on export levies.

*Source: Appendix on Tanzania Case*

One major strategy for enhancing the role of farmers and other local stakeholders in demanding, procuring and resourcing local service providers is through decentralization. Not only for local extension

management, but also for local funding. This strategy is strongly pursued in Rwanda, Tanzania and Mozambique.

**Box 3 Mozambique: Pluralist agricultural extension system**

The Mozambican agricultural innovation system is characterized by a dominant smallholder farming sector for some 50% operating at subsistence level and an emerging smallholder and small-scale commercial producing sector. The system is strongly market driven, but hampered by poor infrastructure. The public administration is decentralized, but fiscal and democratic decentralization is not yet complete. Economic development funds are available at district level and are managed by the district administration. Agricultural extension service delivery is largely de-concentrated to the district level. At district level coordination takes place between public, private and NGO service, roughly one third each in number of staff in the field, resulting in a major extension management challenge. The national extension programme (government and multi-donor funded) also aims at the development of the capacity of local agribusiness development service providers, as well as the contracting in of the required private and civil society services, based on identified demand. The required services are to be contracted at district level contributing to the management challenge. The demand for such services is established at district level by farmer and local or district stakeholder advisory councils or farmer fora. The main constraint is capacity development of both public and private service providers, farmer service providers and extension management capacity at district level.

*Source: Appendix on Mozambique Case*

The demand orientation by farmers for the local services is made possible through the establishment of local stakeholder committees in charge of coordination priority setting and resource allocation. Although services are certified and contracted at by district authorities, accountability is to the farmer dominated stakeholder committee in order to guarantee downward accountability. In Tanzania, Rwanda and Mozambique these local platforms of farmers are, as in many other countries (e.g. Uganda, Zambia), instrumental in demand articulation, in Mozambique even more so, in the absence of full democratic decentralization. These platforms can be complemented at district level with multi-stakeholder platforms in the form of district advisory councils.

**Box 4 Rwanda: Developing a local service provider capacity**

The change process for the Rwandan extension system is based on enhanced demand articulation; financial empowerment of district stakeholder platforms; develop local service provider capacity; and Farmer Field School learning as a cornerstone. Local service providers are from the public sector and NGOs (largely), as well as some private professional service providers and embedded services in private agribusiness firms. The district stakeholder platforms have representatives of all these actors, including the producer organizations. The development of a critical mass of quality market-oriented service providers is the main government strategy for sustainable service provision. Also a transparent quality control system for public, private and other service providers is being established.

*Source: Appendix on Rwanda Case*

Various forms of district platforms are representing and are rooted into local groups such as community groups, farmer groups, associations, learning groups, farmer field schools, farm business schools, etc. Multi-stakeholder alliances of different types of local stakeholders (farmers, NGOs, local agro dealers, traders, community radio, agricultural extension staff, etc.) further strengthen this demand articulation (Rwanda, Mozambique). Joint identification of a few key value chains relevant for local economic development can further assist in the focus of district and advisory service activity (Tanzania and Mozambique). Formal farmer organizations participate in this process, but farmers at district level often represent a wider variety of social capital than just the local chapters of the formal farmer organizations.

### 3.5.3 Market-oriented services

Extension or advisory services are increasingly being requested by farmers to provide information on access to markets and developing farming as a business. This is a service which requires knowledge of the markets and enterprise development, but also the skills to support farmers or farmer groups/associations and cooperatives in developing business plans for investment by rural finance organizations, banks or district development funds. Market orientation in service provision (Market-Oriented Agricultural Advisory Services, [www.afaas.org](http://www.afaas.org)) is getting renewed in almost all national extension or advisory services systems.

The elements in this are not only having extension advising on entrepreneurial activities beyond production, but also by involving more private service providers in this agribusiness orientation. This involves capacity development of self-employed private service providers (Mozambique), as well as development of fee-based agricultural advice (Rwanda) or complete (coffee, sisal, tobacco or tea) or partial (cashew, cotton) privatization of service provision on export commodities (Tanzania).

This demand for local business development services has been identified as a major constraint in many SSA countries (Heemskerk and Davis, 2010), in terms of capacity, availability and access. Some countries aim at filling this gap by outsourcing these services from the public sector to the private sector service providers (South-Africa, Ghana, Mozambique). Others argue that the changing demands for rural advisory services and business development services in particular can only be fully and properly addressed by the private sector and that service users should at last pay for part of the cost, in order to control the effectiveness of this type of service delivery. Out-sourcing of a wide array of agricultural support services to private sector service providers is a quite common phenomenon in South-Africa, also frequently used in extension. However, to ensure cost-effective use of public funds contracting private services requires a level of competence of the government staff and client beneficiary groups and transparency in the tendering procedures, which at present is only available in rare occasions. In practice there is a wide gap in the very refined, elaborate and detailed PPP legislation and the capacity to check due compliance with the regulatory framework.

#### **Box 5 Ghana: Early adopter of liberalization and privatization policies for extension services**

Since the Economic Recovery Programme in the early 80-ies, national development policies in Ghana have advocated promotion of the private sector to provide support services in the agricultural sector. Research-Extension Liaison Committees were created in five major ecological zones to improve the linkage between actors in the Agricultural Innovation System to differentiate the services supply according to region specific characteristics. Government has facilitated the creation of Federations of Farmer Based Organizations and numerous initiatives have been taken to strengthen provision of extension services, amongst which a multi-year programme with by the University of Cape Coast and Kwadasi Agricultural College to build capacity through extension education. District Assemblies were put in charge of the delivery of extension services, while the Regional Departments of Agriculture retained the mandate for planning, coordination and supervision. Over the last decade the private sector got more and more involved in provision of extension. Most initiatives, centred on Value Chain Development of main export crops are quite successful. The Government has welcomed all kinds of pluralistic modes to supply extension advisory services, but coordination of such initiatives has been weak, which has led to a very uneven distribution pattern of such services. Strategic coordination of development initiatives is the most promising way - but to interlock such initiatives in an effective way to bring about sustainable improvements in the national institutional set up. If the various National Federations of Farmer Organizations could forge strong mutual alliances they stand a better chance to identify viable opportunities for income generating activities for the FBOs at local level, which urgently need to be strengthened.

*Source:* Appendix on Ghana case

All over Africa and the world, it is indeed realized that pluralist service provision systems based on public and private service providers, as well as civil society services (NGOs but also by farmer organizations) are most efficient. These systems are based on local coordination, public-private partnerships, outsourcing some services by the public sector to the private sector and the increasing central role of farmer

organizations in service provision. Services which require competencies which relate to running business incubators, facilitation, brokering and coaching of innovation processes are often not available in the public sector and need to be contracted in, if identified as a priority demand.

**Box 6 South-Africa: Overhaul of the public extension service and public-private partnerships to provide extension advisory services**

The agricultural sector in South Africa is dichotomized comprising a well-developed commercial sector and an emergent smallholder sector. The Government is giving top priority to support the emerging black farmers to become active producers in commercial farming aiming at equitable access and participation in globally competitive markets for sustainable agricultural produce. Extension advisory services play a major role in this endeavour. The situation calls for a huge effort in terms of capacity building, education, training and R&D, but in general, institutes for agricultural education, training and agricultural research are poorly prepared or equipped. To tackle some of the most urgent bottlenecks, the National Government offers a set of general support measures to be delivered by the public provincial extension services supplemented by advisory services provided by the private sector through Public-Private Partnerships. Most Provincial Departments of Agriculture support mentorship programs, in which emergent farmers get subsidies to contract private consultants to provide mentorship services to their farm enterprises. Lack of effective regulatory mechanisms to assure compliance with the legislation ruling contracts and partnerships, and acute shortage of competent staff is a serious constraint aggravated by lack of accountability and transparency in collaboration agreements. A way forward would be a system of more comprehensive extension advisory services with real back-up from the various departments most involved. In 2009 the National Ministry of Agriculture launched the Extension Recovery Programme as a first step to take stock of and systematize the diversity of extension services and service providers in the country.

*Source: Appendix on South-Africa case*

### 3.5.4 Summary: Key trends

Looking across these international experiences, five key trends can be seen in the evolution of agricultural research and extension:

1. Adoption of an innovation systems perspective as a guiding framework;
2. Increasing focus on integrated value chain development and a market orientation;
3. Shift to pluralistic advisory services and input supply systems whereby government extension agencies, private sector actors, NGOs, cooperatives and input suppliers are all engaged;
4. Recognition of the critical role that effective producer organizations play and hence investing in their development and empowerment;
5. Decentralization of government service delivery and decision making, and a focus on local economic development, meaning that agricultural development has to be linked closely with local planning processes.

## 3.6 Implications for Ethiopia

What do these major developments in the research and extension or advisory services system and their role in the innovation system mean in the Ethiopian context? What are the options and what can the referred five principles mean for rural development in Ethiopia?

The innovation systems perspective is a concept which is used by agricultural research and in education, but is hardly mainstreamed. Some individual researchers apply the principles in agricultural research for development. The extension system and the main part of research and education system still operate in the traditional linear system in which technology is similar to innovation and can easily be disseminated, and scaled-up.

Although the research system has adopted the value chain development approach to some extent, extension has not done this and focused on production, while trading, marketing, processing, credit and input supply is mainly left to others, such as the cooperative structure and other local actors, including NGOs.

Research nor extension can hardly be referred to as pluralistic systems, as these are almost exclusive public sector systems with some involvement of other actors through various donor projects. Are there options to involve other service providers with more experience in demand and market orientation, or has this capacity to be developed first?

Are farmer organizations and notably the cooperatives involved in determining the extension agenda at the local level? Do they have a role in the decision-making on the resources for extension and, at a higher level, on research? Now that cooperatives are heavily involved in input supply and marketing, are they in a position to provide business development services?

The decentralization process can lead to local ownership over the economic development planning and priority setting process, as well as the resource allocation at Woreda level. Has the differentiation of local economic development activities led to options that best fit the local context, rather than scaling-up best practices identified elsewhere?

## 4 The Ethiopian Context

During the past two decades and particularly in the past five years, Ethiopia managed to achieve high economic development by implementing the Agricultural Development-Led Industrialization (ADLI) strategy. Progresses made since the last one decade in growth and expansion of services and improvement in human resource development are remarkable. In terms of agricultural development, emphasis has been given to production and productivity increment through the use of inputs such as improved seeds, fertilizers and recommended agronomic practices, coupled with capacity building, institutional arrangements and infrastructure development as well as scaling up of best practices.

### 4.1 Agricultural Performance

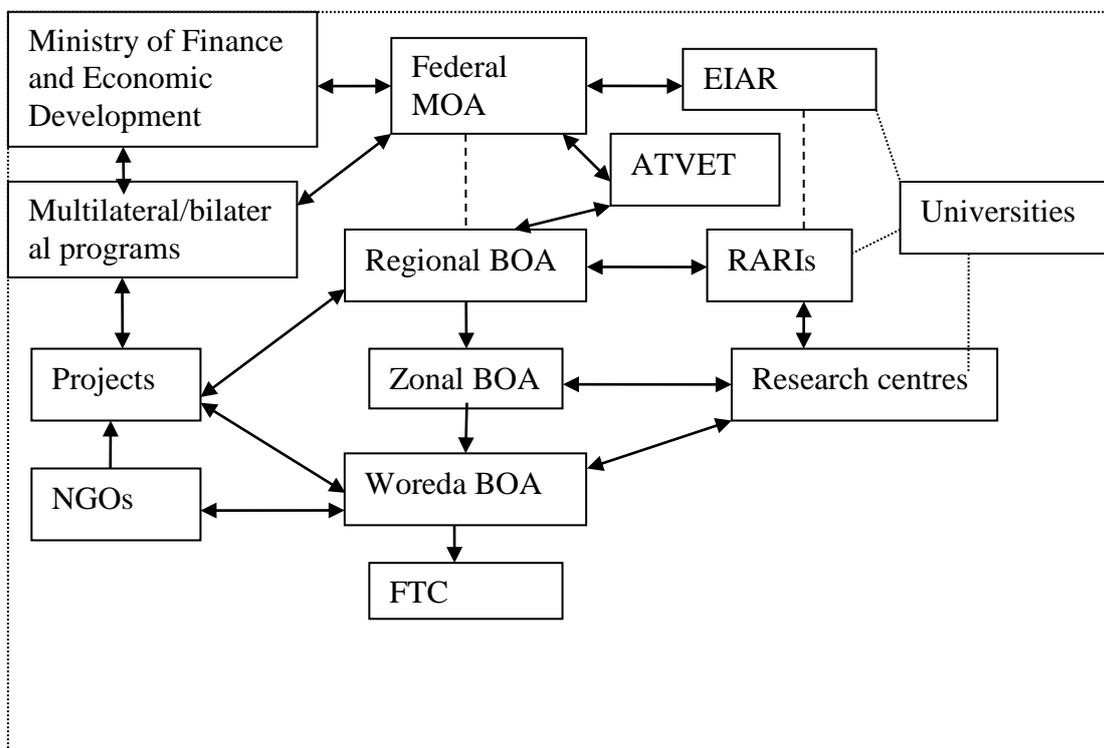
In Ethiopia, agriculture is the most important economic sector contributing 43% of the GDP, 85% of the foreign earnings and employing 83% of the labour force (Deres, 2010). Growth in GDP has been double digit since 2003, during which the agriculture value added growth has been over 10% on an average. The share of agriculture in GDP decreased from 47% in 2003 to 43% in 2008, which is considered healthy growth that agriculture is giving way for industry and services sectors. The achievements in agriculture growth have been manifested in productivity increment of crop and livestock production, market linkage and conservation and restoration of the natural resource base. The impressive productivity increment in major crops could be illustrated by using maize. While the national average yield for maize is 24 quintal/hectare, model farmers harvest, on an average, 60 quintal/hectare, which is more than double of the national average (Deres, 2009). As maize yield potential at research plots could go up as much as 110 quintal/hectare, there is huge potential to increase production to more than double the current production. A similar trend is there for the other major food crops like wheat, teff and sorghum, pulses and oilseeds.

The achievements could be attributed to favourable policy environment, leadership commitment, capacity building of the key actors, particularly mobilizing farmers, training and deploying development agents and professionals and reasonably high budget allocation, which amounts, on an average, to 13.6% during the period 2005-2009. This is well above the New Partnership for Africa's Development (NEPAD) target of 10% (IFAD, 2009). The economic policy of Ethiopia and agricultural strategies and programs are quite consistent with policy directions and principles of NEPAD and Comprehensive African Agriculture Development Program (CAADP) (Ethiopian CAADP Impact, 2009).

PASDEP (Plan for Accelerated and Sustainable Development to End Poverty) targets of accelerated increase in meat and milk production and productivity have been achieved through improvement in veterinary services, animal feeds and genetic improvement using artificial insemination, though the performance of the sector is still very low. Recent survey reports from Central Statistics Agency (2009) indicate that average milk yield per cow has increased by 10% and steady increase in the frequency of honey harvesting per year as a result of introduction of modern beehives and other bee-keeping technologies as well as capacity building through participatory training and awareness creation.

Sustainable land management has been focusing on soil and water conservation measures, restoration of degraded areas and afforestation. The approach of the Ministry of Agriculture for natural resource management is community-based participatory watershed development, recognizing the importance of involvement of actual beneficiaries for sustainable natural resources management and utilization. The sustainable land management has been emphasizing awareness creation, capacity building, knowledge management and co-investment with community. In this regard, remarkable achievements have been registered during the past five years, with regard to land holding certification, delineation and restoration

of degraded land, soil and water conservation, multipurpose tree plantation, forest demarcation, tree seedling distribution and small scale irrigation development during the period 2006-2009 (Deres, 2009).



**Figure 7 Illustration of institutions involved in agricultural development in Ethiopia**

Growth in agricultural production has also stimulated agricultural export. The major export items are coffee, pulses and oilseeds, hides and skin, floriculture and live animals. Based on data obtained from custom office, Deresa (2009) indicated that the total revenue obtained by exporting agricultural products rose from USD 0.546 billion in 2005 to USD 1.5 billion in 2009.

## 4.2 Institutional Arrangements and Actors

The government of Ethiopia established several institutions that support agricultural development. The apex institution engaging in agricultural development in Ethiopia is the Federal Ministry of Agriculture. With the decentralization, there are corresponding regional states' bureaus of agriculture at region, and offices at zonal and woreda levels, providing grass-root services for agricultural development. Institutions such as research institutions, seed enterprises, cooperatives and investment commissions organized at federal and regional levels are also instrumental in supporting agricultural development in Ethiopia. Universities also play key roles in capacity building, research and outreach services (Figure 7).

Among the major institutional arrangements made to support agricultural development at grass-root level, establishment of Agricultural, Technical and Vocational Education and Training (ATVET) colleges to train a large number of grass-root development agents is perhaps the first to be pointed out. The Development Agents (DAs) per kebele (i.e. FTC-Farmers Training Centre) often consist of one each from plant sciences, animal sciences, and natural resource management trained at ATVET for 3 years at diploma level. The envisaged plan was to assign a team of DAs at FTCs to support farmers in knowledge and information transfer as well as demonstrating modern production practices, which in turn enhance adoption of modern agricultural technologies and subsequently increase productivity. Most of the FTCs in the country did not function to the expectation. Recently, middle level veterinary professionals and cooperative organizers are

assigned to serve three FTCs. According to Abera (2009), over 69,000 development agents have been graduated in plant and animal sciences and most of them are working in the public extension program. Despite the substantial investments made so far in institutional arrangements, institutions like FTC still need more facility, logistics, operational budget and methodological innovation to deliver the intended services.

Multilateral and bilateral donors as well as NGOs are also playing key roles in supporting government efforts to increase agricultural productivity so as to reduce poverty and ensure food security, while conserving the natural resource base in a sustainable manner.

Due attention has also been given to cooperatives to support agricultural development in terms of inputs distribution and output marketing as well as agro-processing. Primary cooperatives and unions have been playing key roles in agricultural inputs and outputs marketing and distribution and to some extent contractual improved seed production, as discussed in the subsequent section. The recent establishment and effective operation of the Ethiopian Commodity Exchange is another major institutional arrangement to facilitate and modernize marketing of major agricultural products such as coffee and oilseeds like sesame by ensuring quality and standards.

One of the structural reforms that the government is implementing is public service reform aiming to increase the efficiency and effectiveness of public services at all levels, which is largely using Business Process Reengineering (BPR) as a major change in management system. The implementation in the agricultural public institutions such as ministry/regional bureaus of agriculture, agricultural research institutes, seed enterprises, cooperative commissions, etc., would help increasing the efficiency and effectiveness of agricultural service deliveries to the farming community. The BPR also demands transparency, integration, alignment and organization of institutions delivering relating services, which would help such institutions to align and organize themselves for related goals. The increased efficiency and effectiveness as well as alignment and partnership of agricultural public institutions in delivering service would support agricultural development, when coupled with farmers training, NGO and community-based organization support and private involvement.

## 4.3 Cooperative Sector in Ethiopia

### 4.3.1 Development of Cooperatives

Traditional cooperative associations existed in Ethiopian society centuries ago in the form of *iqub* and *idir*. *Iqub* is an association of people having common objectives of mobilizing resources, especially finance, and distributing it to members on rotary basis. *Idir* is an association of people having an objective of providing social and economic insurance for the members in the events of death, accident, damages to property, etc. In the case of funeral, *Idir* serves as funeral insurance where community members elect their leaders, contribute resources in kind or in cash and support the mourning member. According to Dercon et al. (2006), the funeral insurance rules define membership procedures, pay-out schedules, contributions and also a set of fines and other measures for non-payment of contributions, or for matters such as not showing up at funerals or not contributing enough in terms of labour on these occasions.

**This traditional form of association is basis for the modern ways of group based production and marketing endeavours in the Ethiopian societies.**

However, the history of formal cooperatives in Ethiopia dates back to 1960, when the first cooperatives' directive was enacted. In this period cooperatives were few in number with few members who mainly engaged in production of commercial crops. During the socialist government (the *Dergue* regime), cooperatives were formed to assist implementation of the government's policy of **collective ownership of properties** since they were considered as a mass movement that could ensure equitable mobilization

and distribution of resources. Under this system, cooperatives were forced to operate in line with socialist principles, which meant that **production and marketing of produce were done collectively**. Membership to cooperatives was also compulsory, which goes against the basic cooperative principle of voluntarily participation. But due to the downfall of the regime, most **rural based cooperatives were abolished by members and their resources were looted and misused**.

The cooperative sector in Ethiopia plays a central role in the enterprise domain of the innovation system (Figure 4). Cooperatives represent farmers and are the only formal voice of farmers in different platforms. At the same time cooperatives have been central in input supply services, increasingly in financial services and in chain empowerment through processing and marketing.

Currently, cooperatives are recognized as an important instrument for socio-economic improvement of the community. The Proclamation No. 85/1995, Proclamation No. 147/1998, and Amendment act No. 402/2004 which have been enacted and made consistent with the Universal Cooperative Principles. This demonstrates that the federal and regional governments have realized the contribution of cooperatives to economic and social development, food security and poverty reduction in Ethiopia.

Moreover, the free market economic system posed many challenges as the bargaining power and subsequent limited competitiveness for smallholder farmers is low, the youth who aim to become entrepreneurs are poor, and to purchasing power of the consumers is low. These important market actors also have limited skill and capacity. Thus, collective efforts through cooperative organization have been chosen by many disadvantaged groups as a pathway for increasing the benefits they can ascertain from a liberalized market system. As a result, different types of cooperatives have been formed to meet different economic and social objectives.

Cooperatives in Ethiopia are classified based on the nature of activities with which they engaged in. The cooperative could engage in a single activity such as production, marketing, among other; or could be involved in multiple activities, in which case it is called a multipurpose cooperative. Accordingly, there are producers' cooperatives, marketing cooperatives, saving and credit cooperatives, consumers' cooperatives, hand crafts cooperatives, mining cooperatives, housing cooperatives, construction cooperatives, service cooperatives, among others.

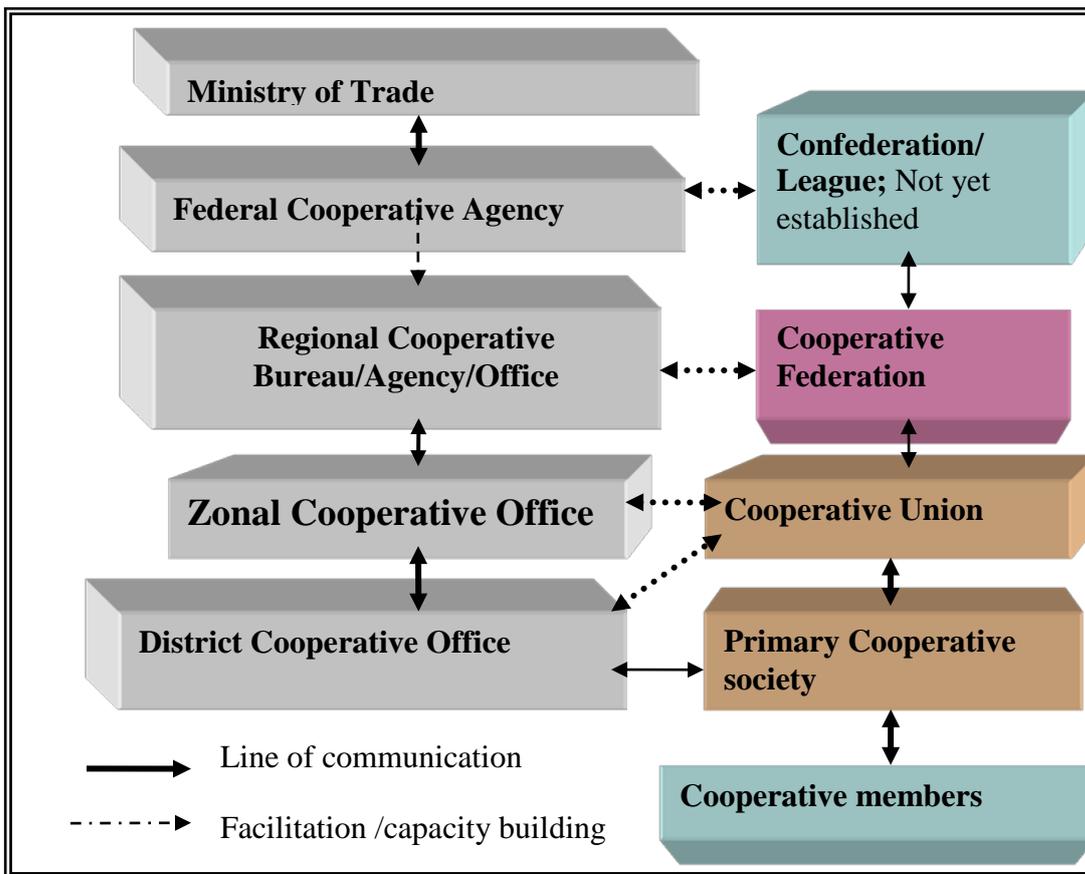
In terms of hierarchy, there are four tiers of cooperatives, namely primary cooperative, cooperative unions, cooperative federation and cooperative confederation. In Ethiopia, the apex in many regional states is the cooperatives union (Figure 8).

According to the information obtained from the Federal Cooperative Agency FCA, the number of primary cooperatives in 2010 was 34,829 with total number of members 5,622,362 of which approximately 18 per cent was female. This amounts to 50% of all smallholder farming households. In 2010, there were 10,348 cooperatives involved in agribusiness activities, which represent approximately 30% of the total number of cooperatives in the country. During the same years, the Federal Cooperative Promotion Agency (FCA) reported 8,220 Saving and Credit Cooperatives.

The total number of cooperatives unions was 216 in 2010 with 5,957 member primary cooperatives (i.e. only 17% of all cooperatives).

Three of the nine regions of Ethiopia, namely SNNPR, Tigray and Amhara have so far enacted their own cooperative proclamations. Southern Nations, Nationalities and Peoples Region (SNNPR) of Ethiopia recently established the first Regional Farmers' Cooperatives Federation in Ethiopia which became functional starting early 2009 whereas Oromia Regional state has just formed the Regional Federation of Farmers' Grain Marketing Cooperatives. Tigray region also founded a cooperative federation in 2010 which started export of oil crops in the same year.

Figure 8 Organizational structure of cooperatives in Ethiopia (Since Sept. 2010)



#### 4.3.2 Role of cooperatives

Cooperatives play crucial roles in economic and social development. A large number of cooperatives in Ethiopia participate in marketing of agricultural inputs and outputs. Cooperatives are engaged in 36 different types of activities (FCA, 2007) including grain marketing, coffee marketing, saving and credit services, vegetable and fruit production and marketing, livestock marketing and dairy production and marketing, etc. Currently, cooperatives are engaged in production and marketing of improved seeds. Moreover, cooperatives and unions provide marketing options for the members and non-members which also stabilize the product price. Cooperative unions are involved in export and domestic marketing activities, financial transaction, and social capital development, and pay dividend to the member.

The cooperatives collect products from their members at fair prices during harvest time, when prices usually fall drastically and sell them when prices recover. Cooperatives play important role in agricultural inputs supply and marketing of outputs. In relation to improved seeds supply in the country, cooperatives have been motivated by projects supported by foreign sources. Through their role in inputs marketing and seed production, the cooperatives and their unions play important role to create access to input. Unions are also instrumental in creating possibilities for credit access by the primary cooperatives. Moreover, cooperative unions are also entering into agricultural value addition by setting up processing industries.

Accordingly, some unions such as Leche Hadiya Farmers Cooperative Union (in SNNPR), Oromia Coffee Farmers Union and Ambo Multipurpose Cooperative Union (in Oromia) have engaged in value addition processes by establishing processing plants.

The cooperative federations in Ethiopia have the role of facilitating large scale cooperative activities such as import and export activities in which large number of cooperative unions participate. In doing so, the federations increase economic efficiency, contribute to capacity building, and networking of cooperative unions. Others are Adet Cooperative Union in Dairy Production, Adama-Lume in haricot processing for export.

### 4.3.3 Constraints

The government and different NGOs like VOCA, Self Help International, etc have implemented capacity building projects for cooperatives. Despite these, the cooperatives in Ethiopia still encounter technical skill constraints and capital shortages, which hinder the attainment of their objectives. Cooperatives are also constrained by shortage of financial resources to operate at full scale. Primary cooperatives lack access to bank credit. Even unions borrow when they get collaterals from regional governments. Many cooperatives lack well designed strategic plan and risk management portfolio.

Some issues: Are cooperatives crowding out private sector development due to their monopoly in input supply and possibly in marketing?

Why are so few cooperatives organized in unions (only 17%)?

What is the voice of the farmers at national level and other levels, other than through the cooperatives?

## 4.4 Current Policy Developments

Economic development of Ethiopia is guided by the Agricultural Development Led-Industrialization strategy. The agriculture and rural development policy direction is to enable farmers/pastoralists use modern agricultural technologies and new agricultural practices efficiently and effectively so as to increase production and productivity. In addition, the policy provides a framework to boost the share of domestic and foreign investors in the agricultural and rural development sector.

In line with this strategy, the agriculture sector policies, strategies and programs have been formulated and implemented during Sustainable Development Program to Reduce Poverty (SDPRP) and Plan for the Accelerated and Sustainable Development to End Poverty (PASDEP). As part of building a vibrant market economy that benefits Ethiopians and eliminates dependence on food aid and assures rapid economic growth, the fundamental agricultural strategies during PASDEP have focused on specialization, diversification and commercialization of agricultural production to realize accelerated agricultural development and agro-industries, which in turn would contribute to the overall economic growth of the country. The major objectives to achieve accelerated transformation of subsistence agriculture to commercial farming include adoption of high yielding technologies, diversification of high value commodities, promotion of commercial agriculture, improvement of marketing systems, development of irrigation and water harvesting technologies and sustainable use of natural resources. Elements of the natural resource management in the PASDEP have been strengthening land tenure security through land certification, participatory watershed management and strengthening natural resource information management, specifically rigorous evaluation, synthesis and dissemination of best management practices and innovations in sustainable land management.

Perhaps another most important policy engagement of the government of Ethiopia is civil service reform in which change in management known as Business Process Reengineering (BPR) is being employed in all public institutions, including the agricultural sector. The BPR basically aims to reduce cost, improve speed and quality of service delivery. It also endeavours to ensure transparency, team work and empowerment of employees to take decision, which of course, is with full accountability. By implementing BPR, it is felt that the increase in efficiency and effectiveness of service in key areas such as agricultural research,

technology multiplication, agricultural inputs distribution and marketing and overall extension services would help to support agricultural development as indicated in Growth and Transformation Plan. The impact is yet to be seen.

For the coming five year fiscal plan period (2010/11-2014/15), the Growth and Transformation Plan (GTP) is guiding the economic development, including that of the agricultural sector. As shown in Table 1, it targets doubling agricultural production through production and productivity improvement of smallholder agriculture by way of wide scale use of improved inputs and better extension services as well as scaling up of best practices; promoting commercial agriculture in lowland areas, where vast land could be brought under use; development of small to large irrigation infrastructure and promoting private investment in commercial agriculture including floriculture and transforming farmers to producing high value agricultural commodities so as to generate income from their produces. The later direction will be implemented together with local specialization of commodities and scaling up of market infrastructure.

**Table 1 Selected targets for the GTP**

Variable	Base year figure (2010/11)	Target figure (2014/15)	Per cent increase
Crop area (Million ha)	11.8	13.4	13.6
Quantity of agricultural produce (Million tons)	20.8	51.7	148.6
Coffee area ('000 ha)	462	815	76.4
Coffee production ('000 tons)	341	831	143.7
Meat production ('000 tons)	613	836	36.4
Milk production ('000 tons)	3,261	11,176	242.7
Egg production (Million)	79.1	294	271.7
Honey production ('000 tons)	44.7	103	130.4
Agricultural value added (Billion Birr)	58.4	86.2	47.6
Coffee Export ('000 tons)	319.6	601	88.0
Meat export ('000 metric tons)	10	111	1,010.0
Small scale irrigation ('000 ha)	853	1,853	117.2
Beneficiaries of PSNP ('000)	7,821	1,353	(82.7)
No. of cooperatives ('000)	26.8	50	86.6

In general the GTP 2010/11-2014/2015 illustrates the shift from national food security orientation in agriculture to a more agribusiness and industrial orientation in agricultural development (from agricultural development led industrialization to a more industrial development led economy). The GTP indicates two main investment strategies: (i) room large scale private investment in agriculture coordinated through the investment bureau; and (ii) investment by the government and the development partners in small-scale farmer production, processing and marketing, coordinated by the Ministry of Agriculture. The Growth and Transformation Plan (2010/11-2015/2015) refers to the scaling up of best practices, as one of its key strategies for enhancing productivity. This inventory which is currently on-going (identification, documentation and registration of agronomic practices of successful farmers) is not yet considering, organizational and institutional/political dimensions of the scaling up of best practices.

## 4.5 Agricultural Growth Program

Agricultural growth registered in the past years was not without challenges. Poverty, food insecurity, and degradation of the natural resources, susceptibility to natural calamities such as drought were the major challenges to the overall economic development of the country. Moreover, quantity and quality of agricultural products are not matching the export potential of the country. As a solution to these challenges and to promote stakeholders participation in agricultural value chain development and promote commercialization of the Ethiopian agriculture, Agriculture Growth Program (AGP) has been designed (MOARD, 2010). The AGP aims primarily at increasing agricultural productivity in a sustainable manner, enhancing market performance and facilitating value addition. The AGP is a five-year program and implemented in selected targeted areas in four high potential regional states, namely Tigray, Amhara, Oromia, and SNNPR. Based on criteria such as suitability for agriculture, potentials for irrigation, access to infrastructure and institutional capacity, 80 woredas are selected; i.e., 34 woredas in Oromia, 22 woredas in Amhara, 19 in SNNPR and 5 in Tigray.

The main peculiar strategic intervention approaches of AGP are: (1) comprehensive (included production, marketing, marketing and irrigation infrastructure development), (2) value chain (dealing with stakeholders including producers, assemblers/traders, processors, distributors, exporters, retailers and finally consumers), and (3) decentralized and demand-driven (bottom-up planning process and equal participation of women and men in problem identification, planning, implementation and monitoring the activities).

The major components of AGP are: (1) agricultural production and commercialization (including sub-components like institutional strengthening and development, scaling up of best practices, market and agribusiness development), (2) small scale rural infrastructure development and management (including sub-components such as small scale agricultural water development and management, small scale infrastructure development and management, like rural roads and market centres). AGP also supports key public institutions and private business that have a multiplier effect on the growth of the agricultural sector along the value chain.

AGP gives a priority to strengthen and develop relevant institutions for agricultural growth in terms of working facilities and skill development. Key institutions identified for AGP intervention are: (1) extension services at federal, regional and woreda levels, (2) Agricultural Development Partners Linkage Advisor Council (ARDPLAC), (3) Soil Testing Laboratories and Animal Health Services, (4) women/youth groups, and (5) cooperatives. Likewise, the main support of the AGP with regard to scaling up of best practices is to narrow the gap between average farm yields and those achieved at experimental farms or by progressive farmers, and support for innovations, demonstrations and adaptive research on-farmers field. The market and agri-business subcomponent supports farmers-market linkages for inputs and outputs and will attempt to boost value chain development through improving quality and standard of marketable products.

AGP is estimated to cost about USD \$ 264.115.8 million, major donors being World Bank, UNDP, CIDA, REN, and USAID. Government and community will have also some contributions to the total fund requirement. The Ministry of Agriculture at federal level and the sector Bureaus at Regional and Woreda levels have the overall responsibility and accountability for execution of the program.

### 4.5.1 ARDPLACs

Agricultural Development Partners Linkage Advisor Council (ARDPLAC) is a new naming for the previous Research Extension Farmers Linkage Advisor Council (REFLAC). Previously supported by Agricultural Research and Training Project (ARTP) and recently by the Rural Capacity Building Program (RCBP) (both funded by the World Bank), REFLAC has been operating at zonal level, taking research centres as central point. The zonal REFLAC often represents beyond the administrative boundary of a particular zone. Instead

it represents the major operation area of a particular research centre, which could accommodate more than one administrative zone. The zonal REFLAC is chaired by the Head of Zonal Office of Agriculture and where more than one zones are involved, the chairmanship is in rotation, with one year terms of office. The secretary is a research centre director assisted by a senior research extensionist.

The second higher level of the organization of the ARDPLAC is at regional level, where head of the regional bureau of agriculture and the director general for a regional agricultural research institute is the chairperson and co-chairperson, respectively. More recently, ARDPLAC is also established and operating at national level, with corresponding dignitaries at federal level. Lower level establishment and operation of ARDPLAC is also promoted at woreda level, following the same suit but more remains to be done in this regard. At all levels, partners in the ARDPLAC include members from ministry/bureau of agriculture, researchers, universities, ATVET colleges, agricultural investors, NGOs, agro-processors and cooperatives/unions.

Whatever the level of operation, the main purposes of the ARDPLAC are to identify problems and set research agenda, assign tasks to pertinent partners to solve research problems and administrative matters constraining agricultural development and to involve partners in scaling up/out of best practices (including technology multiplication efforts) as well as to link agricultural products with market, agro-processing industries and consumers. It is also a forum for exchange of information and feedback gathering on the performance of released and adopted technologies so as to improve further technology generation process and market linkage (e.g. haricot beans, wheat and malt barley). The role of cooperatives and their unions should be recognized in this development endeavour.

An effective agricultural development and delivery system requires a good linkage among all actors of rural development where ARDPLAC is trying to make a difference. The ARDPLAC promotes effective linkage among all actors of rural development, particularly linkage among research, extension and development partners so as to enhance agricultural development. Although AGP supports the establishment and strengthening of ARDPLACs at all levels, due focus is given at woreda level to promote participatory need-based service delivery to both women and men at grass-roots.

## 4.6 Donor Engagement

Donor engagement in the Ethiopian economic development in general and agriculture development in particular has been crucial for the successful achievement of the intended goals and implementation of the favourable government policies, strategies and programs (IFAD, 2009). Starting in 1993, the SG2000 demonstrated the remarkable productivity increment of major crops, animal husbandry and natural resources conservation by using appropriate technologies at appropriate time. The record break productivity increment stimulated the public extension system to scale up the technology demonstration plot of the SG2000. This project is being followed by Alliance for Green Revolution in Africa, still supporting agricultural research, extension, improved seed and other inputs delivery as well as partnership and processing of agricultural products.

The support provided from multiple donors (largely the World Bank) for projects such as Agricultural Research and Training Program (ARTP), Improving Productivity and Market Success (IPMS) of Ethiopian Farmers Project (largely from CIDA) and Rural Capacity Building Project (RCBP) (largely from the World Bank), has significantly contributed to success in agriculture development in terms of human resource development, facility and logistics development and acquisition, technology and information transfer as well as irrigation infrastructure and value chain development. The contribution of Coffee Improvement Project (CIP) by the support of the European Union has been quite remarkable in supporting the technology development, nursery development, better extension services, facility and logistics development as well as human resources development (researchers, extensionists and coffee growing community). The International Fund for Agricultural Development (IFAD) has been involved in supporting key areas such as

small to medium irrigation infrastructure, rural finance, and pastoral community development. The Department for International Development (DFID) has become one of the Ethiopian's major donors since the last five years in Rural Finance Development especially for the saving and credit cooperatives. The African Development Bank has also continued to support Ethiopian economic development efforts since 1993. In terms of agriculture, the Bank has been supporting the Agricultural and Rural Development, and management of water resources (irrigation and water harvesting, watershed management and river basin studies). JICA also supported innovative technology transfer projects through Framers Research Group (FRG) which is becoming instrumental in the scaling up process. SNV is also promoting value chain development in Ethiopia.

USAID is largely supporting development in animal husbandry and nutrition and animal products such as dairy development and hygienic presentation of hides and skins to the local tanneries, value chain development, etc. In Ethiopia, the main focus of USAID 5-year strategic plan in the agricultural sector is to manage the transition from an emergency response-dominated program to one that productively builds capacity to prevent famine and promotes economic growth. Since starting this strategy in fiscal year (FY) 2004, USAID/Ethiopia has designed agricultural activities, valued at USD 116 million, which are to be implemented through the end of FY 2010. The ultimate goal of the agricultural program is to assist Ethiopia in achieving market-led economic growth and to improve the resiliency of farmers, pastoralists and other beneficiaries.

More recently, the Sasakawa Africa Association/SG2000-Ethiopia has received a grant of USD5.73 million from the Bill & Melinda Gates Foundation to strengthen extension services that promote the scaling up of modern agricultural practices and increase the productivity of resource-poor smallholder farmers in Ethiopia. The grant is operated for four years and will be used to develop 180 model Farmer Training Centres (FTCs) and 18 Woreda Extension Resource Centres in 18 different woredas. The major purpose is to build an effective institutional extension model to promote farm enterprise, diversification, increased food security and additional sources of income.

## 5 Emerging Issues and Opportunities in Ethiopia

Based on the interviews and literature review, the following section examines emerging issues and opportunities for agricultural innovation in Ethiopia.

### 5.1 Positive Examples of Innovation

There are many positive examples of agricultural innovation, both technological and institutional to be found in Ethiopia. This report documented 21 such innovations (see Appendix 1). These were captured by asking those interviewed what they consider to be the best examples of innovation in the sector. The examples cover the Oromia and Southern Nations, Nationalities and Peoples Regions which were the focus for this report. These examples offer an insight into innovation dynamics and illustrate the value of learning lessons from such experiences. In most of the examples the strong driving role of market incentives and the importance of individuals and organisations who play a 'brokering' or coordinating role was notable.

The examples listed provide a rich picture of the variety of innovation in terms of the three main characteristics recorded: (i) the scale and impact of the innovation; (ii) the innovation process with actors; and, (iii) the type of innovation and main lessons. The lessons to be drawn on agricultural innovation dynamics in Ethiopia can serve to orient agricultural development at local and policy levels.

Although different drivers of innovation were mentioned in the survey, notably research actors (MoA, research institutions as well as universities) and policy-, decision-makers, and international development partners, because of their market orientation and market partners, played a role. Some different stakeholders (notably research and extension) came up with similar innovations, illustrating interaction.

It is clear from the examples provided, that market actors play a crucial role in almost all the innovation examples. Most innovations combine technological and institutional aspects. Those interviewed tend to first identify the technological aspects, while in further discussions the institutional aspects emerge. For example, seed cooperatives (potatoes, onions, hybrid maize, and bread wheat), farmers' research groups, regional seed policy, course and curriculum change (university and ATVET), farmer-to-farmer technology transfer, farmer category targeting, small-scale business service provision.

The innovation process is generally understood to be involving different actors. Research actors are almost omnipresent, but extension and other public sector actors (including Ethiopian Seed Enterprise) are often mentioned. Of the enterprise domain, smallholders and their groups (FRGs, FREGs) are seen as key partners, although cooperatives less often. The role of women in innovation process seems to depend on the types of commodities involved. Their role is high in garden crops, horticulture, dairy and poultry. For example, women organized themselves regarding potato innovation in Holeta and in some FRG groups in the refit valley, women also acted in groups to participate in potato seeds multiplication and marketing. The role of women in dairy innovation is significant. Facilitation of the process, actor network or platform is often done by one of the stakeholders, and rarely by free actors.

In Chapter 3, the main characteristics of well-functioning agricultural innovation system, based on lessons from other countries and global experiences with innovation have been documented. Five of these principles were analysed for the documented innovations (See Table 2).

The main conclusions are:

- The innovation systems perspective is relatively well addressed in the referred innovations. A variety of stakeholders is involved from the start of the innovation process. In absolute terms this performance is minimal, only three cases (potatoes, malt barley and onion) show the required score.
- Quite a few innovation examples follow a value chain approach and are strongly market oriented, seven of these form the maximum score. The value chain approach is relatively well developed.
- A pluralist service system in which public and private, as well civil society service providers closely work together, which is important for knowledge sharing, learning and up-scaling, is only found in a few examples, including one innovation of private service delivery itself.
- Although an estimated 10% of all Ethiopian farmers are a member of a cooperative, and the widespread adoption of the Farmer Research and Extension Group concept, emphasis on farmer empowerment in the referred innovations is limited. The exceptions are those in which farmer groups are directly involved in the innovation e.g. on seed potato and bread wheat seed production and dairy and honey production.
- In all innovations limited attention is given to the involvement of the local government and the contribution to local economic development.

The overall conclusion based on this rather random list of encountered innovations in parts of Ethiopia is that more emphasis is needed for pluralism in service provision, farmer empowerment and the role of the local government.

**Table 2 Main characteristics of documented innovations (see Appendix 1)**

No	Innovation	Innovation systems perspective (all key actors strongly involved)	Value Chain development and market orientation	Pluralistic advisory services systems (public, private and CSO)	Empowerment of producer organizations (incl. women)	Local Economic Development (Woreda involvement)
1	Potatoes	++	+++	+++	+++	+++
2	Malt Barley	+++	+++	-	-	-
3	Dairy SNV	++	+++	+	+++	-
4	Honey SNV	++	+++	+	+++	-
5	Sesame GTZ	++	+++	+	+	-
6	Fruit grafting	++	+	++	-	-
7	Zero Tillage	++	-	++	-	-
8	Onion seed	+++	+	+	+	-
9	Haricot Bean	++	+++	+	-	-
10	JICA FREGs	++	-	-	++	++
11	Flowers	++	+	++	-	-
12	Goat Farming	+	-	-	+	+
13	Bread Wheat	++	+	-	+++	+
14	Taro variety	+	-	-	+	+
15	Dairy w/extension	+	+	-	+	++
16	Pineapple	++	++	+	-	-
17	Hybrid maize	++	+	+	-	-
18	Service provision	-	-	+++	+	++
19	ATVETs	+	+	++	-	+
20	Bee hives	+	++	-	-	++
21	Carrots	+	+++	-	-	++

+++ = Principle well addressed in this innovation; ++ = somehow addressed; + = hardly addressed; - = not addressed

Although positive examples are provided in relation to the use of innovation systems and value chain perspectives, the role of the market actors in the innovation process at an early stage, needs to be strengthened.

Cooperatives/unions also apply innovative seed supply system though this is driven by development partner funded projects and international private sector activities. For instance, the “local seed business project” funded by the Netherlands Embassy and jointly implemented by Hawassa university, the regional Bureau of Agriculture, NGOs, Cooperatives, research institution and individual farmers resulted in increased awareness of business undertaking by the cooperatives; closer collaboration with stakeholders and increased engagement of students on adaptive and development research. The unions engage in marketing of agricultural products. Hadiya Farmers Cooperative Union has established wheat processing factor to engage in value addition creating market access to the producers whose business behaviour has positively changed due to the participatory joint seed business development project. Similar experiences have been observed with NGOs working with cooperatives in different parts of Ethiopia including Oromia and Amhara regions.

## 5.2 Evolution of Marketing and Supply Chain Services

Government policies and emerging economic circumstances are creating the conditions for a much more market oriented approach to agricultural development. This complements a historical focus on food security where more attention was given to direct production aspects. Currently there is much emphasis on development of entrepreneurial activity by both farmers and local enterprises, the latter who can add value and provide input supply and market services. However, to fully realise the policy objectives more capacity and understanding of market and value chain development is needed across the agricultural research, education and extension system. Further, there is a need to strengthen the role of private sector players and support a more plural service sector to enable a wider scale uptake of market driven approaches.

Public agricultural extension, and to a lesser extent research services, are largely production and hence farmer focused. Marketing and cooperative agencies are now located under the Ministry of Trade and Industry. This institutional setup contributes to some of the difficulties in better linking production and market aspects of the agricultural support system and weakens the capacity in the public sector to provide effective business development services. Private sector and NGO capacity to offer such business development services to small-scale farmers and enterprises is also very limited relative to the potential scale of demand.

The Ethiopian Institute for Agricultural Research EIAR documented a large number of successful cases of value chain development in which technology generated by EIAR played an important role. This, as well as other activities sponsored by EIAR, CG institutes (e.g. IPMS) and the ASARECA Competitive Grant System, illustrate the changing emphasis of research from a pure production orientation to research taking into account its relevance for market-oriented production (Tsedeke Abate, 2006). It should be noted however that further research on the institutional aspects of market development also seems warranted.

The Agri-ProFocus network in general and in Ethiopia in particular has identified the shortage of service providers for development of local businesses as a major constraint for enhancing farmer entrepreneurship. Strengthening the market orientation and agribusiness development by smallholders is, however, a main priority of the Ethiopian Government. Four main categories of service providers for business development can be distinguished:

- (i) Public services, to be strengthened with a more agribusiness orientation;
- (ii) Embedded services, such as through the input supply and marketing cooperatives and unions, as well as private sector actors;

- (iii) NGOs and civil society organizations; and
- (iv) Commercial local BDS providers. In all categories the capacity is limited but emerging.

The following strategies are developing based on some limited experiences (<http://www.agri-profocus.nl>)

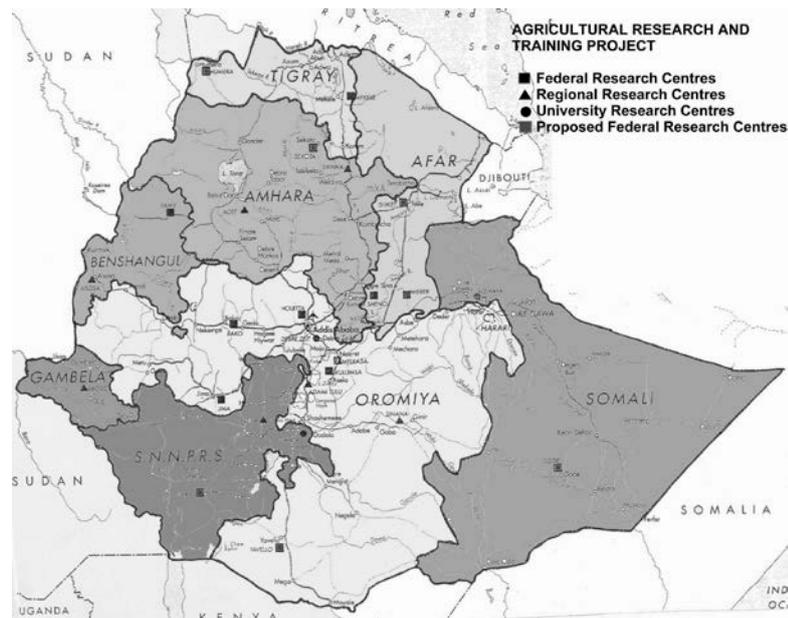
- Development of commercial quality BDS for downstream actors: processors/traders/producers, notably through involvement of urban based services;
- Development of NGO and cooperative BDS, as well as urban BDS providers, as is a strategy followed by SNV, and ILRI, and includes the development of small-scale local business development service providers;
- Development of embedded services (input supply; credit; higher chain actors), also through the cooperative unions and market actors; and,
- Development of market-oriented public advisory services, as is the main strategy of the AGP.

The experiences that exist with service providers for development of local businesses like NGOs (ILRI, SNV etc.), the private sector (e.g. in the horticultural sector), as well as with the public sector (research, universities, etc.), although more limited with extension, need to be shared, for the benefit of a more integrated service delivery system.

### 5.3 Differentiating the Sector

The agricultural sector in Ethiopia is very diverse due to differences in agro-ecology, social, infrastructure and marketing factors. The public agricultural, research and extension services at federal and regional level focus on support for male and female smallholders across the country. Differentiation in intensity and diversity of service delivery is based on the agro-ecological zone concept and their potential, as well as some main commodities, rather than on different categories of farmers. In terms of the capacity of small-scale farmers to engage in market linked entrepreneurial activity there is a need to better understand which farmers have the capacity and assets to do so and which do not. The livelihoods framework can be of value in this regard. It is also important that local innovation systems are tailored to local conditions and operate flexibly and dynamically in relation to the capacities and assets of local farmers. This requires a thorough understanding of the interest and incentives for individual farmers and cooperatives, the ecology in which they operate and the market opportunities. Learning from local innovation processes is instrumental in this regard.

The Ethiopian Institute for Agricultural Research (EIAR) operates 14 Federal Agricultural Research Centres (ARCs) in the country and 11 sub-centres and testing sites. Moreover regional agricultural research institutions, with autonomous rights and responsibility, operate several research centres in their respective regions. Strong regional research institutes are in Oromia, Amhara, SNNP and Tigray regions. Most research centres are located in the highlands covering about 8 Agro-Ecological Zones (AEZs) out of the total of 18 AEZs in the country. However, a number of new research centres have been built in order to improve coverage of another 3 main agro-ecological zones in the country. Each Federal ARC focuses its research on specific agro-ecological zones and has specialized their research on certain agricultural activities (crops, livestock, soil and water management etc.).



**Figure 9 Location of the agricultural research centres across regions**

*Source: ARTP, 2003*

Similarly extension services are concentrated in some major agro-ecological zones. The vast majority (45,812) of the currently employed DAs are located in four regions, including: Oromia (19,654), Southern Nations, Nationalities and People's (SNNP) Region (11,061), Amhara (10,196) and Tigray (2,067) (Davis and others, 2009). These are also the target regions for the AGP. There are approximately 550 woredas (districts) in Ethiopia and it was reported that approximately 450 of these rural woredas are in immediate need of agricultural extension services (PAD, 2010).

The public research and extension organizations categorize farming households according to the agro-ecological zone they operate in and consider all households with potential for enhanced food security and market integration.

As introduced in Chapter 1, three categories of rural households have been considered by the joint Ethiopian-Donor Sectoral Working Group on Rural Economic Development and Food Security (RDE-FS):

1. Food security category, structurally depending on food aid, through the safety net programme and through emergency aid programmes. Some 7-12 million people, facing great challenges in terms of natural resource depletion and recurrent droughts. The main challenge is guaranteeing household food security, as in the safety net programme.
2. Growth 1 category: Majority of rural households, estimated at 50-55 million people, who have just enough to live off, but have serious productivity problems and limited market integration, with degrading natural resources. Main challenge is to transform their mainly subsistence production system, with enhanced input supply and market linkages.
3. Growth 2: Some 3-5 million people with better market integration and involvement in (semi-)commercial, specialized production of commodities. The main challenge is to improve quality and enhance added value throughout the value chain.

The main target group of the AGP is the small- and medium-scale farmers in the selected 80 woredas in four regions, who crop an average area of somewhat less than 1 hectare (ranging between 0.25 and 2.3 hectares). The total population in the 80 woredas is 9.8 million people in an estimated 2 million households. Women and young people will be encouraged to participate. Other beneficiaries of the AGP,

whose participation would also benefit smallholders, are large commercial farms, farmer organizations, traders, agro-processors, and others (PAD, 2010).

In the draft Growth and Transformation Plan (2010/11-2011/15) more focus is given to agribusiness development and access to markets. In this context, a special strategy is being developed for the landless youth and women. Based on their interest (market orientation of youth and processing interests of women) non-farm income generating activities will be supported through business skills development and access to credit and markets.

Although research and extension services target their interventions based on agro-ecological zone potential, the shift towards more market orientation and agribusiness and value chain development is likely to bring in other criteria as well. These will relate to the level of market integration of different farmer categories which in itself is determined by many factors, varying from farmer capacity (knowledge skills and entrepreneurial mindsets), as well as the interaction with other key actor domains in the rural innovation system. This leads to a clear categorization (mainly in the Growth 2 category) for commercial fruit production (pineapple, apple, etc.) in which SNV is involved in Ethiopia.

## **5.4 Understanding of Market Driven Approaches and Innovation Systems and Processes**

Many of the people interviewed said that they felt an attitude change was needed in how agricultural development is understood. There remains a strong perception that agricultural innovation predominantly involves developing and having farmers adopting new technologies that will increase yield. The concept of agriculture innovation systems, as articulated in Chapter Two is not well understood across the agricultural education, extension and research institutions. This is understandable as the agricultural education curriculum has historically focused largely on technical capacities for production and not on the capacities needed to develop new markets and coordinate agricultural value chains.

When initially asked about examples of innovation, most people initially give examples of a new technology. Most actors in the agricultural innovation consider innovation as generating a new technology. The mentioned technology is then still mostly referring to the production function of the value chain, rather than processing or marketing. The national policy framework has only partially embraced the role of the private sector as a driver for innovation (e.g. due to ECX, marketing monopoly of the cooperatives, etc.). However, the given examples of innovation (Appendix 1) show the central role of the market and private sector interest in driving innovation. The innovation process is, however, mostly not starting with the market and the analysis of market opportunities and/or market feasibility studies. Involvement of market actors only occurs at a late stage. Market supply or spot market focus rather than market demand is often the starting point (cf referred ECX policies). The GTP (2010/11-2011/15) also still sees the role of the private sector, mainly in terms of input supply (fertilizer and seeds) and less in terms of marketing.

Research (EIAR and regional research institutes) has adopted in its strategy the agricultural research for development principles. The research system uses a limited innovation system perspective, as evidenced by the use of these principles (cf IAR4D principles referred to earlier): (i) The joint development of the research and development agenda is used in some platforms such as the coordinating groups and learning alliances (NGO approach), while the local ARDPLACS are yet to be established, and need to be based on learning from the RELC experience. How flexibility of local innovation processes and networks are facilitated is not yet clear, nor the Woreda commodity priority setting process (see AGP for high potential Woreda); (ii) Facilitation of interaction and learning between actors is often the role of research by default, as hardly any other services are available. Land learning approaches, such as in Farmer Field Schools, and learning alliances are not used widely; (iii) Joint and multiple, ex-ante, assessments are not mainstreamed and require a value chain, as well as livelihood systems perspective, gender, etc. (iv) Up- and out-scaling strategies are based on inventories of best practices, although possibly useful as a

database, do not provide sufficient attention for functional (approaches), institutional, cultural, political aspects, at best some agro-ecological aspects are in place. In reality the following four main principles are not fully mainstreamed in the public research system (Tsedeke Abate, 2006, Heemskerck, 2007).

At the same time public research and extension services are gradually becoming more market-oriented in Ethiopia. For research this is evidenced by a publication on value chain development, which highlights good practices in scaling up and out of new technologies through partnerships with market parties (Tsedeke Abate, 2006). Interaction with the private sector was also triggered by ASARECA Competitive Grant Scheme projects and CGIAR research projects (ILRI, CYMMIT), which strongly emphasize market orientation in research. In extension, the market orientation is relatively new, as such services are largely left to the Cooperative Agency and the Marketing Agency of the corresponding ministries (Berhanu Gebremedhin et al., 2006).

## 5.5 Drivers of Innovation

The growing Ethiopian economy, combined with emerging export demand presents many opportunities for market-oriented agricultural development. As illustrated by most of the case studies market linked/value chain oriented agricultural initiatives are flourishing. In these cases the driver of innovation and agribusiness development is the market opportunity. Although technological production capacity is a critical component, evidence suggests that to achieve a rapid up-scaling of current successes, reforms are required in the institutional setting, to ensure a more market driven approach to agricultural innovation and development. Up to now, the existing agricultural research and extension system remains predominantly focused on technology development and enhancing productivity at farm level.

Research and extension priorities have traditionally been focused to assisting attainment of food security. Now that agricultural strategies are changing towards more industrial-led (read agribusiness-led) rural development, more room will develop for market parties as the driving force in agricultural innovation and development.

Most actors in the research and education domain see the supply of technology and hence their own role as the main driving force for rural innovation. In practice research is conscious of the role of the market and interacts with market parties both for seed supply (bread wheat, onion seed, potatoes, etc.) and processing (malt barley, durum wheat, dairy sector, etc.). An important element here is the advanced capacity of research organizations to actually drive this process, as evidenced by the many examples in the appendix which illustrate a drive by research.

An overall concern remains on the importance given to the private sector in value chain development, in innovation, in service delivery, and the realization that the private sector and in particular the market actors are essential for triggering innovation and hence enhance competitiveness in the sector. Commercial horticulture (flowers, fruits, vegetables, haricot beans), as well as small-scale horticulture innovation processes (honey, carrots) is driven by the market, but all other more food security type innovations (bread wheat, potatoes,) and domestic market innovations (malt barley, dairy, onions, goats, taro, maize) are still largely driven by the public sector, but also eventually discovering the private sector (Tsedeke Abate, 2006).

## 5.6 Linkages between Key Players

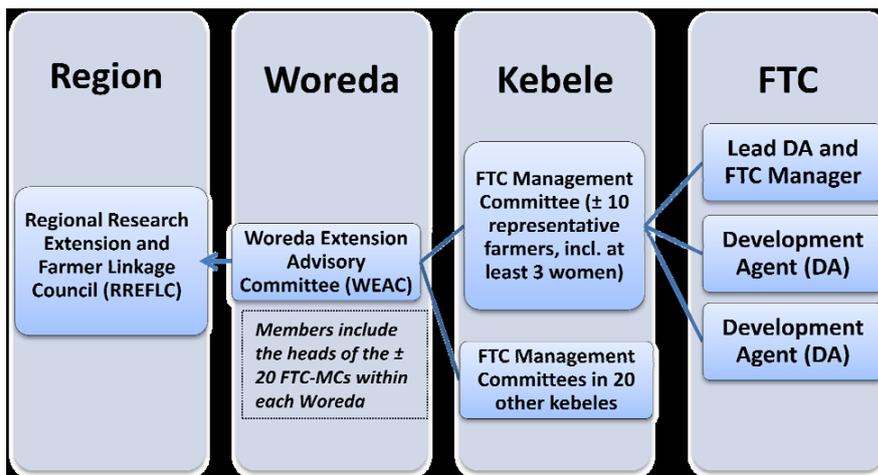
The interviews made with the different players involved in innovation illustrate the fragmentation in the knowledge systems in general, but particularly at a local level (woreda and kebele). Mechanisms for coordination have been formed at regional and zonal levels and are planned at woreda level. Lessons from these platforms illustrate the importance of coordination but there remains a limited role in facilitation of

innovation processes. The current platforms have been largely government instituted with a major dominance of the public sector. More open, transparent and flexible mechanisms are needed, based on interest rather than duty to ensure a stronger coordinating role with market players. The current separation between different ministries of the agricultural production functions and the marketing functions as carried out by the unions and cooperatives was noted as a potential risk in further delinking production and market innovation. The emphasis in the AGP on coordination through ARDPLACS at all level offers ample opportunity for strengthening linkages. The way in which this coordination role is executed is likely to have a significant impact on innovation processes in the sector.

Most agencies recognize the separation and parallel functioning of knowledge systems driven by private businesses, NGOs and governments agencies, but the following observations were made:

- in general the trend is for further integration between all three systems;
- integration between NGO driven systems and Government driven systems is developing faster, notably between NGOs and extension at the lower levels;
- relation between private sector and governments systems remains limited, except for input requirements. Exceptions exist for the large scale state farms, which are mainly producing food crops;
- interaction between MoA and research organizations (EIAR and the regional research organizations) and the Universities is not structural and limited to informal arrangements and projects.
- the relation between the research organizations as a whole and the private sector as well as farmer organizations (cooperatives) remains weak and anecdotal.

At Federal and Regional level (mostly research centre-based), Research, Extension and Farmer Linkage Councils (REFLC) were established (starting in 2001) by EIAR and RARIs and the corresponding research centres. These platforms were to bring together farmers, researchers, extension specialist and other development practitioners. At the village level, research also gave emphasis to working with Farmer Research Groups (Seid Ahmed et al., 2006). Extension has been experimenting with Woreda Extension Advisory Committees at District level (see Figure 10), while FTC management committees bring together actors at Kebele level. The platforms have been referred to by some as innovation platforms and teams (AGP, 2010, Berhanu Gebremedhin et al., 2006), but in practice all these committees did not go beyond coordination of activities. The REFLC were not only facilitated (both in the true sense and in terms of resources), but also actually driven by research.



**Figure 10 Structure of advisory committees at different levels**

Source: IFPRI, 2009

New multi-stakeholder platforms (ARDPLACs) are replacing the existing REFLCs. The REFLCs operated at Federal, Regional and Zonal levels. Although the functioning of the REFLCs was not evaluated, the

Committees were focused on coordination, were dominated by research, and were not really facilitated by independent actors, in order to make effective learning possible. The main change with the establishment of ARDPLACs is that these: (i) Have a wider composition; (ii) are to be facilitated by extension; and (iii) will also be operating at Woreda level. The ILRI supported IPMS programme supported Woreda Knowledge Centre, administered by the Woreda Advisory Learning Committee, has experimented with innovation and learning processes at District level. Centres have, however, often not gone beyond information sharing, capacity development and coordination of activities, also due to the absence of facilitation capacity.

Some NGOs in Ethiopia have been experimenting with innovation platforms, networks or learning alliances, which are more focused on a particular value chain or commodity. Learning alliances are clusters of farmer organizations, NGOs and other actors, which aim at improving their business and market position,

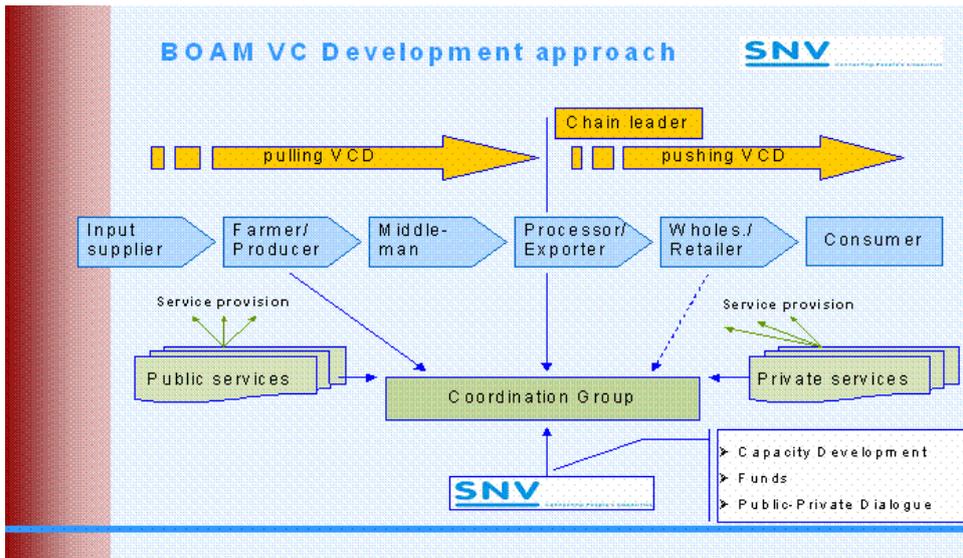


Figure 11 SNV value chain approach and actors of platform

through a facilitated learning process which integrates training and work activities in a cycle of workshops, field assignments and coaching visits (<http://ethiopialearningalliance.net>). SNV (BOAM) is supporting similar initiatives in the pineapple, dairy and honey innovation systems by organizing multi-stakeholder innovation platforms, which are facilitated by externally contracted consultants in a process in which the platforms meet every 3-6 months and implement agreed activities in between <http://www.business-ethiopia.com>. See Figure 11 for the platform actors along the value chain development by SNV.

Component I of the AGP deals with agricultural production and commercialization. Its sub-component 1.3 is about Market and Agribusiness Development. The institutional arrangement during PASDEP vests the authority to implement this component with the Ministry of Agriculture. The recent shift of the Agricultural Marketing function to the Ministry of Trade may disjoint the development of commercial agriculture. In effect, the Ministry of Agriculture which is the implementing agency for AGP has no mandate to implement the market and agribusiness development component of AGP. Thus, the implementation task has been given to USAID, which may not serve as a permanent solution.

## 5.7 Innovation Brokering and Facilitation

Brokering of innovation networks and facilitation of innovation processes is a capacity which does not widely exist in the current extension setup. Some experiences are emerging through private sector, NGOs and donor supported initiatives. In general, brokering and facilitation skills are weak particularly at local levels. Nevertheless, it is increasingly realized by research and extension that such skills are needed if all relevant actors (e.g. market actors, and private service providers) are to be engaged in the innovation process. The lack of 'soft' skills was also a key issue raised by the IFPRI/Gates report. Recognition of the value of 'free actor facilitators' (people or organisations who are perceived by others as having a relatively neutral position) is growing but still relatively limited. Research and university organizations as well as the corporate horticultural sector see potential for playing a greater role in this regard.

Free actor facilitation experiences mainly exist with NGOs (e.g. coordinating Group mode by SNV, or the learning alliance by NGOs) and the commercial sector (Horticultural Development Agency as facilitator in the floriculture export system). These are promising in terms of being truly interactive (based on independent facilitation), but also had disadvantages (costly and slow process, no active coordination of the process), and sometimes driven by NGO or donors rather than supported by system stakeholders.

The Farmer Trainer Centres can develop into local platforms, networks, based on the anticipated steering committee. The local FTC DAs (with education in crops, livestock and natural resource management) will be complimented with a cooperative and marketing DAs. A multi-stakeholder FTC steering committee could oversee the facilitation role of those DAs.

EIAR researchers in particular (e.g. Headquarters, SARI and Ambo), but also researchers from Universities are increasingly interacting with market parties (Tsedeke Abate, 2006, Heemskerk, 2007) and have as such changed their attitude towards the private sector, but according to research managers, market-orientation skills and knowledge still needs to be improved, as is evidenced in the Hawassa University Operational Research project (Moti Jaleta et al., 2007).

A similar observation applies to the perceived need of facilitation skills in multi-stakeholder settings, as well as the need to have independent or free brokers in such processes. The need is recognized by SNV, not less by researchers (e.g. Hawassa University, SARI, EIAR Headquarters), as well as the Bureau of Agriculture, as expressed by their observation: "Facilitation of the innovation process?: " We can do it ourselves".

The public extension system, operating at various levels (Kebele, Woreda, Region and federal level) could potentially play this facilitation role in value chains and innovation processes. The current capacity of the public extension system to facilitate processes and/of multi-stakeholder interaction is however weak and not emphasized yet. Although plans exist for enhanced capacity development for the facilitation of market and value chain integration.

The teaching mode of universities and extension, and the role of graduate students in villages in the absence of staff has led in some cases to emphasis on student development rather than on rural development or its integration. Practical attachment has been limited by lack of budget and staff supervision, resulting in graduates with little facilitation skill.

Cooperatives are creating good opportunities in terms of linking research, extension and universities. On the bases of out growers, unions are facilitating production of commercial crops by their members; also serving as an agent that secures market for their products. The local seed business project jointly implemented by Hawassa, Haramaya, Mekele and Bahir Dar Universities and the Oromia Seed Agency, research institutions and cooperative unions is a good example in this case.

Other existing pilot experiences that can be mentioned in this context are presented through SNV (honey and pineapple case), ILRI/IPMS (dairy and honey), commercial service providers (floriculture, honey quality

control), and PROLINNOVA. At a different level, IPMS (ILRI and Melkassa Agricultural Research centre) has facilitated in a dynamic way, and based on a strong market involvement, the development of e.g. onion seed production (see Appendix 2).

An important element in the facilitation of multi-stakeholder processes are the incentives available, which are not only compensating to some extent for the investment made, but also important to overcome the attitudes of distrust (e.g. between public and private sector). The IPMS programme opted for stakeholder meetings without allowances in order to identify genuine interest, while the old RELC meetings (now being replaced with ARDPLACS) were being driven by sitting allowances. Other more immaterial incentives are more in the organizational support for multi-stakeholder interactions (research policies and Competitive Grant scheme requirements) and genuine interests of the actors (e.g. the private sector in the SNV and IPMS supported platforms, and commercial farmer cooperatives).

## 5.8 Role and Capacities of Research Institutions

Ethiopia has a strong foundation for agricultural education at both the university and college levels and is producing a large number of graduates. However, the capacities of these institutes are severely stretched in terms of physical, financial and human resources. The consequence is that graduates do not necessarily develop the full set of competencies and practical experiences required to be fully competent in the positions they take on after graduation. There is a limited interaction between the education institutions and the research and extension system, which reduces the opportunities for students to gain practical experience. These issues are widely acknowledged and both the government and the institutes themselves have a strong interest to strengthen the effectiveness of agricultural education and training.

The Ethiopian Institute of Agricultural Research (EIAR) has evolved through several stages since its first initiation during the late 1940s. Until the mid-1960s the Imperial College of Agricultural and Mechanical Arts at Haramaya, was the major research entity. The establishment of the Institute of Agricultural Research (IAR) in 1966 was the first nationally coordinated agricultural research system in Ethiopia. The Ethiopian Agricultural Research System (EARS) consists of EIAR, Regional Agricultural Research Institutes (RARIs), and Higher Learning Institutions (HLIs). As an apex body, EIAR provides strong leadership in coordinating research within the Ethiopian Agricultural Research System (EARS), by taking a leading role in influencing agricultural policy development. This leading role is not taken for granted by the Agricultural Faculties of the Universities, nor by other research actors (regional research organizations, private sector, CG institutes etc.) In addition to conducting research at its federal centres, EIAR is charged with the responsibility for providing the overall coordination of agricultural research countrywide, and advising Government on agricultural research policy formulation. Currently, the EARS comprises 55 research centres and sites located across various agro-ecological zones. EIAR's mission is to conduct research that will provide market competitive agricultural technologies that will contribute to increased agricultural productivity and nutrition quality, sustainable food security, economic development, and conservation of natural resources and the environment.

Research organizations have developed a systems perspective in their work over the years, based on previous work on farming systems, watershed systems, and value chains. A large number of scientists has been trained amongst others by ICRA (54 researchers) in Agricultural Research for Development (AR4D) with an innovation systems perspective, although not all are still in the research system. Previous Netherlands funded programmes on vertisol management, cool season legumes and barley have introduced new concepts such as priority setting by multi-stakeholder committees, Farmer Research Groups, gender sensitivity and up and out-scaling strategy development.

The capacity of researchers in facilitating innovation processes is illustrated by the publication of value chain development cases (Tsedek Abate, 2006) and publications on Client-Oriented Research (Dubale et al., 2000). Although this has led to the operationalization of multi-stakeholder platforms, the innovation

systems perspective based on research as a mere contributor to innovation has not been fully institutionalized.

## 5.9 Role, Curriculum and Capacities of Education Institutions

Ethiopia has a strong foundation for agricultural education at both the university and college levels and is producing a large number of graduates. However, the capacities of these institutions are severely stretched in terms of physical, financial and human resources. The curriculum has remained largely of a technical nature meaning that students do not adequately develop the marketing, innovation and 'soft' competencies that are increasingly recognised as an important complement to technical capacities. The consequence is that graduates do not necessarily develop the full set of competencies and practical experiences required for them to be fully competent in the positions they take on after graduation. There is a limited interaction between the education institutions and the research and extension system which further constrains the creation of opportunities for students to gain practical experience. There is wide recognition of these issues and a strong interest from both the government and the institutions themselves to strengthen the effectiveness of agricultural education and training.

### 5.9.1 Universities

There are 23 public universities in Ethiopia; some 10 new ones are planned to emerge soon. The agricultural universities are highly focused on the role of producing large numbers of agricultural graduates. They have limited resources for this function and resources for engaging in collaborative research and making linkages with the agricultural research institutions are even more limited. Historically the curriculum has been largely technically orientated with less attention for the marketing, socio-economic and stakeholder facilitation aspects of agricultural development. Cognizant to this, a NUFFIC funded agribusiness and value chain programme is going to be established at Haramaya, Hawassa, Jimma and Ambo Universities and are expected to be part of the solution.

Despite resource constraints, there are encouraging examples of university staff working to support students in field learning activities. For example the link between Jimma and Hawassa Universities in the horticulture sector, Hawassa University and bread wheat research (examples 11 and 13 in Appendix 1) and Ambo University, which is supporting local women in dairy production.

### 5.9.2 ATVETS

There are 25 ATVETS across Ethiopia that provide diploma level training in the agriculture sector and which since 2000 have produced some 60,000 graduates (12 per cent women) who have mostly been initially employed as DAs. There are seven federal ATVETS managed by the MOARD, with the remainder under the MOE structure.

The focus of the ATVETS has been on animal science, animal health, plant science, natural resources and more recently cooperative development.

The ATVET system provides a strong foundation for the capacity development of field level extension staff. There are also innovative examples of ATVETS engaging in a wider range of service delivery and of actively linking with research, extension and NGO initiatives (see example 19).

Overall, however, there remain significant issues that need to be addressed. The curriculum remains highly focused on scientific knowledge and technical skills with limited attention for areas such as marketing, participatory approaches to extension, gender issues facilitation and communication. The ATVETS have a very high throughput of students for the available resources. This has implications for the availability of teaching facilities and resources and the ability of the institution to provide in-depth individual

guidance, particularly in relation to practical skills. Equipping graduates with the practical competencies needed to gain the trust and respect of farmers and to be effective in the field remains a major challenge. The high demand for trainers in the ATVET system means that it is not always possible to find staff who also have the necessary practical orientation and competencies. The feedback received in undertaking this assignment very much aligns with the conclusions drawn by the IFPRI/Gates Foundation Review of Extension (Davis, 2009).

### 5.9.3 Incentive Structures

In looking towards change in how universities and ATVETS function and link with research and extension, it is important to bear in mind incentive mechanisms. There are minimal reward mechanisms for staff to take such initiatives. Indeed, resource constraints and demands for large scale education make taking such initiatives very difficult.

## 5.10 Role, Functioning and Capacities of Agricultural Extension

Agricultural extension is foreseen to become more decentralized, agribusiness and market-oriented and farmer demand led in a change process as part of the AGP. This implies a key role for extension in multi-stakeholder processes for agricultural innovation. As yet public extension has not been heavily engaged in this role and has limited process management and facilitation capacity. Although curriculum change at AT Vets is planned, this has not yet been fully developed and implemented. In implementing the AGP, fostering a public extension system that is able to flexibly respond to the dynamics of local level situations is critical. As clearly articulated by the IFPRI/Gates study (Davis et al, 2009), significant challenges exist within the current extension system in relation to field level resources, incentives structures and 'soft' skills of extension agents. However, the enormous scope of the extension system offers much opportunity along with good examples of where it has been very successful.

No models or blueprints for extension exist, but a general consensus is developing for a decentralized, market-led and demand-driven extension system of public, private and civil society service providers (Swanson and Rajalahti, 2010, Davis and Heemsker, 2010). The application of these principles can be analysed in more detail in the Ethiopian context:

**Decentralization:** Agricultural extension is part of the agricultural development budget in each woreda in Ethiopia. The numbers of development assistants have centrally been established, but the operational budget is decided upon locally and is part of the formula-based allocation to each woreda. Extension officers become woreda staff members. Differences' in extension approaches at woreda level can develop, requiring strong mechanisms for sharing knowledge between wereda. This needs to be another dimension of the up-scaling component of the AGP.

**Deconcentration:** Although extension service delivery has been deconcentrated to the FTC level and the kebele (several in each FTC area of influence). Service delivery is still largely oriented from the top and follows T&V approach characteristics, although officially replaced by PADTES, the Participatory Agricultural Demonstration and Training Extension System. The PADTES approach, used by SG 2000, largely depended on agro-ecological zone wide blanket recommendations, demonstrated in FTC plots and farmers' fields, with little room for local demand orientation.

**Multiple service provision:** In different woreda other service providers are operational such as NGOs and private service providers, as well as services provided by the cooperative unions. Coordination is through the woreda, but since formal mechanisms such as ARDPLACS are not yet in operation this coordination is still weak. IPMS has experimented with other local service providers and the coordination at district level (see example 18 in Appendix 1).

**Farmer empowerment:** Farmers are encouraged to join primary cooperatives in order to get access to inputs and markets. The primary cooperatives sell their produce to cooperative unions. Some unions have federated (e.g. in coffee or in the SNNP Region). Only about 10% of the primary cooperatives have a share in cooperative unions, while only about 10% are women. Farmers have also joined RUSACCOs for savings and credit, these are being organized into Cooperative banks (Oromia Cooperative Bank, and the SNPPR Cooperative Bank in the process of being established). Interaction with Farmer Research and Extension Groups is promoted in relation to seed production and technology testing and demonstrations (see also example 10 in Appendix 1).

**Outsourcing services:** The realization that certain services are needed, which only exist outside the public sector has not been operationalized and is not supported at policy level. Although this was an option in the Rural capacity Building Project, RCBP), it was never implemented (Pers. Comm. CIDA).

**Partnerships:** Extension has developed relative good relations with research organizations (sometimes based on Memoranda of Understanding), although not at all levels and sometimes based on one-way relations and rather administrative (e.g. RELCs at National, regional and Zonal level). General partnerships with private sector actors in marketing inputs and outputs are limited, while relations with cooperatives remain limited to the primary cooperative level. Similarly limited formal relations exist (apart from some externally funded projects) between research service providers at federal, regional and University level.

**Extension approaches:** The overall extension approach has changed from a teaching mode (top-down) to a facilitating mode in which farmers are facilitated to express their needs, and demands towards other actors in the innovation system (Berhanu Gebremedhin et al., 2006). The capacity to do this has however not been created. Training in new skills and mindsets is needed.

**Capacities and Incentives:** Despite the large scale training of DAs, capacity at the FTC level is often weak. Further, there is a very limited incentive structure for DAs to stay in position and fully perform their role. These incentive issues relate to salary levels, career progression opportunities, equipment and resources to effectively carry out their tasks and supervision and mentoring.

## 5.11 Incentive Mechanisms

The development of agricultural research, education and extension in Ethiopia has historically focused to a large extent on the development of human capacities with less attention given to the incentive mechanisms necessary for this capacity to be effectively deployed. Most dramatically this is seen in relation to the functioning of the farmer training centres. The capacity of a very large number of DAs has been created through the work of the ATVETS. However at the field level the incentives for the DA to stay in their position and to perform as expected are often weak. Further, the incentives mechanisms for farmers to actively use the training centres are also not necessarily effective. To create an effective market linked innovation system, it is necessary to understand and manage the incentive mechanisms that drive the behaviour of the key actors in the system.

Overall, it is necessary to consider economic, social and moral incentives and how they interact. These are evident in all the innovation cases studied. Firstly, if there is no economic incentive in terms of new markets, higher income, greater cost efficiency etc. then a key driver of innovation is missing. However, many of the innovations also depend on strong social incentives in terms of how farmer groups work, communication and trust building between actors in the value chain and recognition for people who make a valued contribution.

At the interface between agricultural market development and the function of agricultural research, education and extension, it is important to recognise that there are very different incentives at play. Private sector players are very strongly driven by economic incentives while public sector players have a more complex set of incentive mechanisms.

From a public sector perspective, the following examples of incentive mechanisms are important to consider to create an overall enabling environment for innovation and to motivate individuals in the public sector to perform effectively:

- Clear policy directions and mandates.
- Motivating salary structures and career prospects.
- Funding and resources that enable required tasks/mandates to be effectively carried out.
- Effective management and leadership of public sector employees
- Management styles and approaches that encourage questioning, new ideas and risk taking.
- Transparent and effective monitoring and evaluation of programmes.
- Public recognition for good performance.
- Team work and management that hold individuals accountable for delivery on results

It was beyond the scope of this report to look extensively at incentive structures. However, it is clear that capacity development must be well balanced with creating an enabling environment with appropriate incentive mechanisms. The question of incentives was also a key issue raised by the IFPRI/Gates Foundation report on Extension.

## 6 Conclusions and Options

This section provides overall conclusions related to innovation systems, extension, capacity development and the AGP and then gives a set of recommendations for the Netherlands Embassy.

### 6.1 Innovation systems and Processes

The innovation systems concept was introduced in Chapter 2.7 as being a network of actors who interact with each other to experiment, learn and to create the enabling environment for new products and service to be put into use. Ethiopia has in place many of the key elements of an agricultural innovation system. These include extensive agricultural research, education and extension facilities and capacities, a nationwide network of cooperatives and unions, traders, input and service suppliers and active policy development.

The lessons drawn from this review reinforce the view, also articulated in other research reports and policy and strategy documents, that the large potential for agricultural innovation in Ethiopia remains constrained by insufficient linkages between the different parts of the system. In particular, between public and private sector, as well as between service providers in the public, private sector and civil society

In addition, the diversity of agro-ecological zones, geographical features, livelihood systems and administrative boundaries in Ethiopia, highlights the need for flexible mechanisms to facilitate specific, tailor-made innovation processes, emerging at local level. This requires a pluralist system of intermediary agricultural input and service suppliers based on a diversity of public, private and NGO actors.

The need and desirability for better linkages between the different actors for an effective market linked innovation system was clearly articulated by all key stakeholders. However, they were equally clear that there are many barriers in the current institutional arrangements and funding mechanisms that hinder such collaboration. There is a long-standing tradition to give priority to vertical lines of hierarchy within each sub-system and within organizations and entities active in such a sub-system. However, often the key to successful innovation processes is horizontal networking, and because of the aforementioned tradition, people and their organizations have relatively little experience in that respect.

Apart from local markets, the cooperative marketing system and the emerging ECX system, a limited independent marketing system exists. The developing market structure, now policy supported, plays however a role in triggering innovation, but not all other actors realize this importance. Political room has been created to involve the market actors earlier in innovation processes, but apart from the mindset, more emphasis is needed on skills and knowledge development for enhanced market orientation. Of particular importance in creating an overall conducive environment for agribusiness development that creates synergy between local and international players.

### 6.2 Pluralist Extension System

The Ethiopian public extension system has an impressive national network of support for smallholder farmers, 60000 extension workers, which is an enormous potential for rural development support. The structure of the system is based on Farmer Training Centres, SMS technical support at woreda level and coordination with other stakeholders at the level of zones and regions.

At present the system is changing its approach from the transfer of technology (TOT) mode, in which extension is considered to be the driver of innovation, towards a more participatory mode in which

extension is one of the necessities supporting innovation processes at local level and facilitating linkage with other actors. Extension has largely been operating in the campaign mode making use of recommendations specifically geared to the Agro-Ecological Zone it is working in and identified best practices. The transition to a provider of facilitation and brokering role is far from complete and requires massive capacity development, also though coordination and interaction with other (private, NGO, cooperative) service providers (see case on ATVET curriculum change).

Research institutes (EIAR, RARIs), Universities), market actors and donor supported programmes that bring in external knowledge resources as well as often contracting facilitation services, are the main drivers of innovation in agriculture in Ethiopia. This implies that extension staff, also at kebele level, needs to have the skills to interact with all these actors. The public, private and NGO service providers need to share their experiences, for example at woreda level, based on the case described for the woreda Knowledge Centre. There is scope for scaling up this approach. Coordination at this level (WERC/WEAC or ARDPLAC) needs to bring out the lessons to be learned, as well as support new innovation processes in the woreda. The wide variety of experiences of different projects, public and private actors further illustrate the potential to learn from the different approaches and experiences (appendix with cases).

Innovation processes can be driven by policies, as was the case with the emphasis on food security. Policies, however, also influence the way in which the above mentioned processes function and how lessons between different knowledge systems can be shared. The extension system has a role in linking learning at the local level with higher level policy-making (vertical interaction), as well as supporting the lessons and good practices of different local actors and service providers.

### **6.3 Capacity Development**

The need for enhanced innovation processes and the important role identified for a variety of demand-oriented and tailor-made services from a pluralist extension system has exposed some significant capacity gaps at all levels in the current, mainly public, extension, research and education system. Many examples in Appendix 1 illustrate the fragmented processes and show how key actors (e.g. market parties or financial services) are lacking key capacities.

The need for a flexible system of facilitation and bridge-building between actors in the innovation system and coaching of learning and innovation processes requires capacity development in the wider sense. Interaction among existing platforms and linkages need to become more balanced and reciprocal, organizations need to change allowing such interaction while supporting the flexibility in engaging with other actors, and individuals need to develop the skills and mindsets for such interaction. This also requires that the actual facilitators should upgrade their competence (e.g. public and private extension) and extension management at different levels (Woreda, Kebele, National).

The staff needed at FTC/Kebele (Diploma) and Woreda (BSc) level is trained by ATVETs and Universities, respectively. Training and education curricula and methodology of these entities should be adapted to accommodate for the newly required competences in terms of facilitation and brokerage of innovation processes, and enhanced market orientation/integration. These need to complement the existing and important attention given to technical capacities. New ways of classroom learning, practical training and field assignments, should be developed on the basis of concrete cases and actions to develop the required skills.

The overall framework and planning for local agribusiness development and the required services is limited. At the same time, the innovation examples illustrate a general demand for market-oriented services. Complementing of the mainly technical competences of the public extension workers (Development Agents and SMS staff) with business development competence can be further enhanced by facilitation and brokering skills. Simultaneously room for institutional change needs to be created based on

discussed existing examples, such as introduction of more effective bottom up and participatory processes, as well as involving other service providers, which have the required competences on business development and facilitation of innovation processes.

Capacity development is an important element for all actors across the sector, including the private sector. The training given at universities and ATVETs is the basis for expertise and capacity in the sector. However this needs to be complemented by other forms of short course and on-the-job capacity development across the sector.

## 6.4 Implications for the AGP

The agricultural production and commercialization component of the Agricultural Growth Programme has three subcomponents:

- (i) Institutional strengthening and development;
- (ii) Scaling up of best practices;
- (iii) Market and agribusiness development. For each of these three subcomponents the above made conclusions have some implications.

A main element in the drive for institutional strengthening and development is the establishment of multi-stakeholder coordination committees (ARDPLAC) at woreda, regional and federal levels. These platforms are important for coordination, but for innovation processes at that level more flexible structures are needed, as well as a capacity to facilitate such multi-stakeholder processes.

The AGP has identified the need to learn from good practices by individual farmers and others actors in the innovation system. Apart from making inventories of such good practices (innovations at a limited scale), which is being done by regional bureaus of agriculture, more comprehensive stocktaking in terms of systemic analysis of the institutional context is needed. It is also important to learn from best practices in terms of local innovation processes, as illustrated in Appendix 1. These practices should be analysed and discussed in Woreda ARDPLACs, which should coordinate and oversee further strengthening of local innovation processes.

The component on market and agribusiness development requires capacity development and promotion of/ support of service providers for development of local businesses. The existing experiences, like the ones from IPMS, SNV, Agri-ProFocus, including the services provided by cooperative and private input suppliers and output market actors, need to be used for learning from experiences, curriculum development and case study use.

## 6.5 Recommendations for Dutch Support of the AGP

Previous Dutch support for agricultural development in Ethiopia aligns well with the ambitions of the GTP and the AGP and provides a good base of knowledge and experience on which to build in supporting the AGP's implementation. In particular, the Dutch support for value chain development initiatives, public private partnerships, innovation in seed supply and capacity development of agricultural education are important elements on which to build.

The Key areas of the AGP where the Netherlands may have most to offer are:

- Sub component 1.1 – Institutional Strengthening
- Sub component 1.2 – Scaling Up Best Practices
- Sub component 1.3 – Market and Agribusiness Development

### Sub component 3.2 – Monitoring and Evaluation

Overall it is suggested that the Netherlands would focus on supporting the elements of the AGP which are closely linked with knowledge management and capacity development.

Based on the findings of this study the following eight recommendations are made in terms of how the Dutch Embassy could most effectively support the AGP:

**Recommendation One:** Promote and Support an Innovation Systems Approach to the Overall Implementation of the AGP.

Realisation of the ambitions of the AGP will hinge on successful integration of market demands with technological and production capacity, effective input supply, local agri-business development and the creation of entrepreneurial producer organisations. Further, scaling up of success goes beyond rolling out standard practices, and also requires the tailoring of lessons to the specific requirements of particular locations and situations. Collaboration and coordination between different actors across value chains and between public, private and civil society organisations is also critical. All of these developments call for an innovation systems approach to realising agricultural growth. Following the World Bank (2006), an innovation system can be understood as a network of all the public, private and civil society actors involved in the agri-food sector collaborating in ways that enable new products and services to be developed **and** brought into use. It involves not just the creation of knowledge but also the creation of the capacities, learning processes, policies and incentives mechanisms that make problem solving and market development possible. Key to an innovation system is brokering linkages between actors who otherwise may not engage with each other. Market linked innovations systems give particular attention to innovation at all points along a value chain. The importance of innovation in marketing, local agribusiness development and entrepreneurship is well recognised in the AGP. However, historically the sub-systems for agricultural research, education and extension have been mainly focused on aspects of production technology. Further, understanding of the innovation systems approach remains limited and fragmented and there are significant gaps in the capacities and incentives required for this approach to be widely operationalized across the sector.

There is however existing expertise on innovation systems thinking in the research system (based on ICRA and CTA training and client-oriented research programmes in previous years) that can be mobilized in capacity development. Such programmes can also make use of the examples documented for this study and presented in Appendix 1.

Options for consideration:

- Establishing a working group on strengthening capacities for implementing an innovation systems approach linked with the implementation of the AGP;
- Producing a guide on innovation systems approaches, specifically tailored to the Ethiopian context, to support the AGP;
- Integrating innovation systems criteria into planning specific AGP components;
- Integrating indicators and evaluation questions about innovation systems into the AGP monitoring and evaluation system;
- Strengthening linkages between Ethiopia and other countries working to develop an innovation systems perspective.

The following recommendations are all designed to contribute to or link with this first recommendation.

**Recommendation Two:** Strengthen the facilitation and innovation brokering capacities of key public, private and NGO actors.

Facilitation and innovation brokering capacities are critical for agricultural development. Brokering refers to the process of creating the linkages, relationships and trust that enable different actors to work together on innovations. Such brokering generally is carried out by an individual or party who is seen to be acting in the interests of all stakeholders or the effective function of an entire value chain. This reflects wider international experience related to the development of innovation systems, value chain development and participatory technology development. Such capacities are needed at two levels. One is directly with farmers, because working with farmers in a participatory way induces their active involvement in identifying and solving their own problems, which is key to creating the conditions for sustained improved productivity and links with markets. Two is across the entire value chain where it is necessary to bring different stakeholder together to find ways of improving the performance of value chains by developing mechanisms that allow small scale producers to effectively engage. There has been very limited development of facilitation and innovation brokering capacities in Ethiopia and the development of such capacities is largely non-existent in the educational curriculum. However, an underlying tenant of the AGP is effective multi-stakeholder engagement and learning. Not filling this capacity gap could be a major constraint to the ambitions of the AGP, as evidenced by the identification of the constraints in the innovation cases presented. No capacity exists with extension, and private actors in this field are few (see case 16 and 20 on pineapples and honey in particular). Strengthening capacity within this area needs to occur within universities and ATVETS and also as professional development programmes for researchers, extension staff, cooperative and union staff, NGOs and interested private sector actors.

Options for consideration:

- Establish a set of short courses on facilitation and innovation brokering for research, extension and university/ATVET staff in the AGP areas;
- Provide support for ARDPLACS to operate with a facilitated participatory 'learning' based workshop methodology in place of formalised meeting procedures;
- Establish an agricultural development facilitators network;
- Support the development of facilitation skills within ATVETS and universities as a pilot initiative ( this could be in the form of a Niche programme on facilitation/brokering/innovation systems to complement the market development Niche programme);
- Support effective use of participatory rural appraisal methodology by extension staff in a restricted number of FTCs; which could be combined with
- Producing instructive manuals/guidelines/videos that show how effective facilitation can enhance the performance of multi-stakeholder processes and innovation systems.

**Recommendation Three:** Support an AGP wide initiative that would identify and scale-up effective innovation processes, particularly related to best-fit strategies and complementing technical innovations with market and institutional innovation.

Subcomponent 1.2 of the AGP focuses on scaling up best practices. Engaging heavily in this area of work is suggested as a potential niche area for the Netherlands. This would mean taking an innovation systems perspective to assess and support scaling-up opportunities. As explained before there are many examples of innovations and 'best practices' emerging in the sector. However, much more effort and investment is required to identify, learn from and then scale-up these examples. In particular there is a need to combine identification of technical 'best practices' with an understanding of the overall social, policy, market, and financial setting and innovation brokering factors that have created the conditions for successful market linked agricultural development. Experience both in Ethiopia and internationally is creating new insights about the scaling up of successful initiatives. Of particular importance is acknowledging that scaling up occurs most effectively when it involves processes of adapting lessons

from other locations to the unique circumstances of a new context. Therefore those ‘scaling up’ should develop the capacity to do just that: learn from insights and principles from elsewhere to create innovations in their own context. The variation in agro-ecological, market, infrastructure and socio-economic factors between different locations is enormous. This means there is generally little scope for rolling out on a wide scale technologies and management practices without the need for adaptations to local situations. This implies the need for knowledge and capacity intensive approaches for ‘scaling up best practices’.

Options for consideration:

- Supporting a small national level task group of key researchers, policy makers, leaders of education institutions and private sector leaders, linked with a specialist research team, to identify, analyse and promote innovations and innovation processes.
- Piloting an innovation and up-scaling process with a number of ARDPLACS in the priority areas for the AGP.

**Recommendation Four:** Combine direct support for the AGP with complementary activities that enhance innovation capacity and respond to market opportunities.

The cases in Appendix 1 indicate that significant innovations materialized when actors from outside the formal extension structure get support to take initiative, like NGO and research actors, getting support from different development partners. In many cases they have then partnered with the extension staff at district or FTC level to implement and scale up their work. Examples include: the seed sector initiative, Canadian CIDA IPMS, ASARECA competitive grant scheme, GTZ supported sesame value chain, honey and fruit sector development supported by SNV, etc. These are all examples in which donor funding was used to support complementary initiatives that serve as pilot innovations and also contribute to strengthening the capacity of government funded research and extension activities.

The Dutch Embassy should balance its contribution to agricultural development in Ethiopia between direct support for the AGP and complementary activities. These complementary contributions should respond to opportunities for innovation and market development in a flexible way. It is however critical that such activities are well aligned with other developments within the AGP.

**Recommendation Five:** Contribute to the establishment of an effective monitoring and evaluation (M&E) system for the AGP.

Considerable emphasis has been placed in the AGP on the M&E system. A M&E system that supports effective learning and ‘scaling up of best practices’ has to comply with particular requirements. In particular it needs to combine effective stakeholder learning approaches with quantitative and qualitative statistical analysis. Further, it is critical to understand why there has been success or failure, in order to use this understanding for improvements. This generally requires more in-depth qualitative analysis. Over recent years, a wide range of new methodologies have been developed that could assist to put in place a ‘state of the art’ sector-wide M&E system that also makes use of simple ICT-based support tools.

Options for consideration:

- Support for a learning oriented sector wide M&E approach be provided;
- Advice and training for such an approach be provided;
- Support learning from sector-wide M&E approaches in other countries;
- Designing the M&E system in a way that ensures it contributes to the practical ‘learning of lessons’ that can be used by all stakeholders to ensure ‘best-fit’ scaling up of success.

**Recommendation Six:** Encourage the use of an integrated value chain approach in the implementation of the AGP and contribute to developing the required capacities of key players for this to occur.

Many of the cases presented involve market parties at a late stage in the development of new production knowledge, even when they are aimed at increased market sales. Rather than starting with production, experience needs to be gained with innovation, which is driven by the market. The carrot, pineapple and haricot beans cases illustrate this.

Options for consideration:

- Involve market parties in some major domestic and export value chains and finance innovative activities which are initiated by the markets towards small-scale producers
- Making market linkages and value chain integration an explicit part of research design.
- Develop the capacities of research and extension institutions to support and facilitate an integrated value chain approach to agricultural development.

**Recommendation Seven:** Support pilot innovation outreach programmes that strengthen linkages between research, education and extension and are linked with the work of ARDPLACS.

There is widespread recognition among people working in research, education and extension that linkages are weak and need to be strengthened. This is also the main lesson of the innovation cases presented in Attachment Two. However, the motivation and resources for this to happen is limited. The need to strengthen the practical competence of graduates also points to the need to create more opportunities for students to engage in 'real world' project activities. There is ample evidence that when research, education and extension do collaborate, often linked with donor supported initiatives, that much innovation and synergistic development does occur.

Options for consideration:

- Providing resources to enable pilot innovation and outreach programmes that bring research, education and extension together to work collaboratively on priority areas for the AGP such as market and agribusiness development and water management.
- Establish a series of graduate research programmes that are action research based and focus on the practical issues of extension and innovation systems.

**Recommendation Eight:** Continue and enhance the support for capacity development of Universities and ATVETS with a particular focus on complementing technical competencies with those for marketing, agribusiness, facilitation and innovation brokering.

The Netherlands is already active in a range of programmes aimed at strengthening Universities and ATVETS. Enhanced capacity to produce the type of graduates needed for realization of the AGP will be critical and it makes sense for the Embassy to continue its work in this area. However, it is suggested that such capacity development should be especially focused on capacitating graduates who can act from an innovation systems perspective and on assisting educational institutes to interact more directly with research and extension. Specific focus is needed on:

- A proper balance in the curricula between knowledge and skills in the domains of technology and farming systems, market development, socio-economic, institutional issues and facilitation.
- Effective linkage between theoretical/conceptual knowledge, practical skills and attitude for graduates to have a well-balanced overall competence.
- Bringing in more practical examples into the course programmes, including relevant field assignments (e.g. small scale irrigation in the communities around Alage ATVET, rather than large scale irrigation on campus), as well as bringing practitioners from research and extension from the

public and private sector for innovation cases presentation, based on examples such as in Appendix 1.

Resource constraints have meant that education institutions have at times struggled to offer the type of all-round practical and utilization-focused training needed under pressure to provide as soon as possible graduates to farmer training centres or for other functions within the sector. Given the focus of the AGP, it may be fruitful to strengthen education institutions focusing on piloting new approaches in the priority areas for the AGP.

**Recommendation Nine:** Strengthen mechanisms for Netherlands-Ethiopia business and technical co-operation particularly related the dairy, horticulture, water and seed sectors.

There is a range of issues and opportunities where specific business linkages and support from Dutch expertise could provide direct benefits for implementing aspects of the AGP. These areas may include for example the horticulture, dairy and seed sectors and water resources management. These are all areas where the Netherlands has world-leading technical expertise and proven business models.

Options for consideration:

- Creating specific programmes or a funding pool to enable such cooperation;
- Strengthening 'match making' between Ethiopian and Dutch stakeholders;
- Further development of Dutch Public Private Partnership initiatives in the Ethiopian agriculture sector.

## References and Resources

- Abera Deresa (2010). *Accelerated Growth in Ethiopian Agriculture*. MOARD, Addis Ababa, Ethiopia.
- Anandajayasekeram, P. and B. Gebremedhin, 2009. *Integrating innovation systems perspectives and value chain analysis in agricultural research for development: Implications and challenges*. Nairobi, ILRI.
- Anandajayasekeram, P., Puskur, R., and Zerfu, E. 2010. *Applying innovation system concept in agricultural research for development. A learning module*. ILRI (International Livestock Research Institute), Nairobi, Kenya.
- ASARECA and KIT (2007). *Plan for Regional Capacity Strengthening on Integrated Agricultural Research for Development (IAR4D)*. Entebbe.
- Berdegúe, J. A., 2005. *Pro-Poor Innovation Systems*. Rome, IFAD.
- Berhanu Gebremedhin, Dirk Hoekstra and Azage Tegegne, 2006. In: Tsedeke Abate, 2006. Successes with value chain. Proceedings of scaling up and scaling out agricultural technologies in Ethiopia: an International Conference, 9-11 May 2006, Addis Ababa.
- Berhanu Gebremedhin, Hoekstra D. and Azage Tegegne. 2006. *Commercialization of Ethiopian agriculture: Extension service from input supplier to knowledge broker and facilitator*. IPMS (Improving Productivity and Market Success) of Ethiopian Farmers Project Working Paper 1. ILRI (International Livestock Research Institute), Nairobi, Kenya. 36 pp.
- Berihu Assefa, 2009. *Business Process Re-engineering in Ethiopia*. May 2009.
- CAADP (2009). *Ethiopian CAADP Compact: To support the successful implementation of CAADP-Ethiopia within Ethiopia's plan for accelerated and sustained development to end poverty (PASDEP)*. Addis Ababa, Ethiopia.
- Central Statistics Authority (2009). *Agricultural Sample Survey Reports on area, Production for Major Crops (Private Peasant Holdings for Meher Season)*. The FDRE Statistical Bulletins (1990-2009, Addis Ababa, Ethiopia.
- Chema, S., E. Gilbert, and J. Roseboom. 2003. *A critical review of key issues and recent experiences in reforming agricultural research in Africa*. ISNAR research report no. 24. International Service for National Agricultural Research. The Hague, The Netherlands.
- Christoplos, I, 2010, *Mobilizing the potential of rural and agricultural extension*. Food and Agriculture Organization (FAO) and the Global Forum for Rural Advisory Services (GFRAS). Rome: FAO.
- DFID. 1999. *Sustainable Livelihoods Guidance Sheets: Introduction*.
- Davis K. and W. Heemskerk, 2010. *Agricultural Innovation Systems Source Book; Module 5: Extension, overview, thematic notes and activity profiles*. Draft for the World Bank.
- Davis K., B. Swanson, D. Amudavi 2009. *Review of agricultural extension in Ethiopia*. Bill and Melinda gates Foundation (BMGF) For the Government of Ethiopia. IFPRI, June 26 2009.
- Dorosh Paul and Emily Schmidt. 2010. *The Rural-Urban Transformation in Ethiopia. Development Strategy and Governance Division, International Food Policy Research Institute, Ethiopia Strategy Support Program 2 (ESSP2)*. Working Paper 13 Ethiopia. IFPRI-Addis Ababa, June 2010.
- Dorosh, P. and E. Schmidt (2010). *The Rural-Urban Transformation in Ethiopia*. Washington, IFPRI.
- Easterly, William. 2006. *The White Man's Burden: Why the West's Efforts to Aid the Rest Have Done So Much Ill and So Little Good*. Penguin Press.

- Engel P., and Salomon, M. 1997. *Facilitating Innovation for Development*. Royal Tropical Institute. Amsterdam.
- Ethiopia, *Diversifying the Rural Economy: An Assessment of the Investment Climate for Small and Informal Enterprises*, October 6, 2009.
- FAO. 2006. *Building on Gender, Agro biodiversity and Local Knowledge a Training Manual*. FAO, Rome.
- Gebremedhin, B., D. Hoekstra, et al. ,2006. *Commercialization of Ethiopian Agriculture: Extension service from input supplier to knowledge broker and facilitator*. Nairobi, ILRI.
- Hall, A., 2008. *Embedding Research in Society: Development Assistance Options for Supporting Agricultural Innovation in a Global Knowledge Economy*. Maastricht, United Nations University.
- Hall, A., 2007. *Challenges to Strengthening Agricultural Innovation Systems: Where Do We go From Here?* Maastricht, United Nations University.
- Hawkins, R. W. Heemskerk, R. Booth, J. Daane, A. Maatman and A.A. Adekunle 2009. *Integrated Agricultural Research for development (IAR4D). A concept for the Forum for Agricultural Research in Africa (FARA) Sub-Saharan Africa Challenge Programme (SSA-CP)*. FARA, Accra, Ghana. 92 pp.
- Heemskerk W., 2007. Ethiopia IAR4D Review Study Annex 10 of: Heemskerk W., S. Nederlof, B. de Steenhuijsen Piters and B. Wennink 2007. *Integrated Agricultural Research for Development Capacity Strengthening: IAR4D Needs Assessment, Strategy, Programme 2008-2012 and Operational Plan 2008-2010*. ASARECA, Entebbe, Uganda.
- Heemskerk W., N. Lema, D.Guindo, C. Schouten, Z. Semgalawe, H. Verkuijl, B. de Steenhuijsen Piters, P. Penninkhoff (2003). *A Guide to demand-driven agricultural research: The client-oriented research management approach*. IER Mali, DRD Tanzania, KIT. KIT Publishers, Amsterdam.  
<http://www.kit.nl/smartsite.shtml?id=SINGLEPUBLICATION&ItemID=1500>
- Heemskerk W., S. Nederlof, B. de Steenhuijsen Piters and B. Wennink 2007. *Integrated Agricultural Research for Development Capacity Strengthening: IAR4D Needs Assessment, Strategy, Programme 2008-2012 and Operational Plan 2008-2010*. ASARECA, Entebbe, Uganda.
- IFAD 2010. *Rural Poverty report 2011*. International Fund for Agricultural Development, Rome.
- IFAD (International Fund Agricultural Development) (2009). *Federal Democratic republic of Ethiopia: Country Program Evaluation. Report No. 2045-ET*.
- IFPRI, 2009. *Review of Agricultural Extension in Ethiopia. Bill and Melinda Gates Foundation (BMGF). For the Government of Ethiopia. 26 June, 2009*. IFPRI team: Kristin Davis, Burton Swanson, and David Amudavi with valuable assistance from the McKinsey & Company Team: Kathryn King, Aaron Flohrs, and Jens Riese.
- KIT and IIRR, 2008. *Trading up: Building cooperation between farmers and traders in Africa*. Royal Tropical Institute (KIT) and International Institute of Rural Reconstruction, Nairobi (IIRR). KIT Publishers.
- KIT and IIRR. 2010. *Value chain finance: Beyond microfinance for rural entrepreneurs*. Royal Tropical Institute, Amsterdam; and International Institute of Rural Reconstruction, Nairobi.
- KIT, Faida MaLi and IIRR. 2006. *Chain empowerment: Supporting African farmers to develop markets*. Royal Tropical Institute, Amsterdam; Faida Market Link, Arusha; and International Institute of Rural Reconstruction, Nairobi. KIT Publishers.
- Liverpool, L. S. O. and A. Winter-Nelson, 2010. *Poverty Status and the Impact of Social Networks on Smallholder Technology Adoption in Rural Ethiopia*. Washington, IFPRI.
- Mellor, J. W. and D. Paul, 2010. *Agriculture and the Economic Transformation of Ethiopia*. Washington, IFPRI.

- Mengistu, F. T., 2009. *Problems and Prospects of Farmers Training Centres: The Case of ADA'A Woreda, East Shewa, Oromia Region*. Haramaya, Haramaya University.
- MOARD (Ministry of Agriculture and Rural Development) (2010). *Agricultural Growth Program (AGP): Program Implementation Manual (PIM)* (main text). Addis Ababa, Ethiopia.
- Moti Jaleta, D.S. Virk and Belete Gebru (Eds.), 2007. *Operational Research and Capacity Building for Food Security and Sustainable Livelihoods. Proceedings of Irish Aid Supported Operational research Project Review Workshop*. 11-13 January 2007. Hawassa University, Hawassa.
- OECD. (2006) *The Challenge of Capacity Development: Working Towards Good Practice*, OECD Development Assistance Committee, Paris.
- OECD. (2008) *Accra Agenda for Action*. ed. O-DC Directorate: OECD Third High Level Forum on Aid Effectiveness.
- Paulos Dubale, Asgelil Dibale, Asfaw Zeleke, Gezahegn Ayele and Abebe Kirub, 2001. *Advances in vertisols management in Ethiopian Highlands*. Ethiopian Agricultural Research Organization. Proceedings of the International Symposium on Vertisols Management, 28 November to 1 December, 2000, Debre Zeit, Ethiopia.
- Seid Ahmed, Fasil Kelemework and Tsedeke Abate, 2006. In: Tsedeke Abate, 2006. *Successes with value chain*. Proceedings of scaling up and scaling out agricultural technologies in Ethiopia: an International Conference, 9-11 May 2006, Addis Ababa.
- Rajalahti, R., J. Willem, et al., 2008. *Agricultural Innovation Systems: From Diagnostics toward Operational Practices*. Washington, World Bank.
- Spielman, D. J., 2005. *Innovation Systems Perspectives on Developing-Country Agriculture: A Critical Review*. Washington, IFPRI.
- Spielman, D. J., J. EKboir, et al., 2008. *An innovation systems perspective on strengthening agricultural education and training in sub-Saharan Africa*. Agricultural Systems 98: 1-9.
- Swanson, B and R. Rajalahti. 2010. *Strengthening Agricultural Extension and Advisory Systems: Procedures for Assessing, Transforming, and Evaluating Extension Systems*. Agricultural and Rural Development Discussion Paper 44. Washington, DC: The World Bank.
- Tsedeke Abate (Ed.) 2006. *Successes with value chain*. Proceedings of Scaling up and scaling out agricultural technologies in Ethiopia: an International Conference, 9-11 May 2006. Ethiopian Institute of Agricultural Research, Addis Abeba.
- Vermeulen S, Woodhill, J., Proctor, F., Delnoye, R. 2008. *Chain-wide Learning for Inclusive Agrifood Market Development - A Guide to Multi-stakeholder Processes for Linking Small-scale Producers to Modern Markets*. International Institute for Environment and Development, and Wageningen University and Research Centre.
- World Bank, 2010a. *Agricultural Growth Project: Project Appraisal Document*. Federal Democratic Republic Of Ethiopia. September 3, 2010.
- World Bank, 2010b. *Designing and implementing agricultural innovation funds: Lessons from Competitive Research and Matching Grant Projects*. Report Number 54857-GLB.
- World Bank. 2006. *Enhancing agricultural innovation: How to go beyond the strengthening of research systems*. Washington, DC: The World Bank.
- Woodhill J. (2008) *Shaping Behaviour - How Institutions Evolve*. The Broker 10:4-8.
- Zalf, 2010. *Scaling up assessment tool*. By Leibnitz Centre for Agricultural landscape research, In: Rural21: The International Journal for Rural Development. No.2/2010. Volume 44.

## Appendix 1- Examples of Agricultural Innovation

No	Name Location	Description and Impacts	Key Actors and Implementation Mechanisms, driving forces facilitation	Key Innovations and Main Lessons Learned
1	Potato Variety Development and Marketing	<p>The Ethiopian agricultural research system has been developing and promoting potato technologies since more than four decades. The major potato technology developing and releasing centres are Holleta and Adet Agricultural Research Centres as well as Haramaya University. Other centres are extending the proven potato technologies through adaptation and on-farm evaluation as well as scaling up best practices together with District level Bureau of Agriculture.</p> <p>The agricultural research centre (Holeta) has been supporting local farmers to improve and market new potato varieties such as Jalane, and gudane which have superior. Through a participatory process with researchers farmers have tested and selected desirable varieties and found ways to maximize yield. Because of the market opportunities and superior merits of the variety in terms of high yield, better shelf life, ease of cooking and higher prices, the new potato seed production is expanding where there are now over 900 farmers in one cooperative and others are developing. A farmer reports that he has shifted his household's food insecure situation to a situation where they are now able to afford to feed for the whole year, build a new corrugated house, new housing and purchased assets (oxen and farm implements).</p>	<p>The key actors in this innovation have been the local researchers, the local farmers and the farmers' cooperative, development agents (district agriculture office), NGOs, agriculture office (linking with NGOs) and traders. Women are also key players as they have been organized into cooperatives producing potato seeds. Women are responsible for managing the food aspect of potato and storage.</p> <p>The main driver for supporting this innovation has been the researchers from the research centre who have worked with the farmers in a highly participatory and helped them to identify and access markets. The market opportunity has driven the rapid growth in the number of farmer engaging in the initiative.</p>	<ul style="list-style-type: none"> <li>• Through potato innovation, the farmers income improved, assets built, living conditions improved though better housing, nutrition clothing, etc.</li> <li>• Farmers' research group and farmers' extension group are the major sources of biological and physical inputs as well as knowledge and information as means of enhancing the adoption of the potato technologies in the target areas.</li> <li>• Key innovations include participatory variety evaluation, diffused light potato storage and formation of potato tuber seed cooperatives as well as farmer-to-farmer potato tuber seed exchange. However, such cooperatives like business plans and lack market linkage to areas where the seed could attract reasonably high demand. Working with researchers and trying the technology enhanced the innovation capacity of the farmers in terms of improved agronomy and variety selection.</li> <li>• Farmers who could access market linkage could generate good income. This implies that market is a key component of innovation development</li> </ul>
2	Malt Barley	<p>Malt barley technology development and promotion is largely done by Kulumessa Agricultural Research centre (it is the main source of barely research). Other centres like Adet, Sinana and Holeta also do research on malt barely. The number of available malt barley varieties is limited compared to that of food barley. In response to slow rate of adoption, Holeta Agricultural Research Centre has now taken the initiative to facilitate the linkage between malt barely value chain actors. It started distributing the variety to farmers (about 830) and linked them to malt factory for sale. The value chain actors especially the beer factories and malt barely factory has now committed research fund.</p> <p>In Arsi and Bale zones of Oromia, the farmers who have been linked to malt factory earned relatively higher prices and their livelihood improved.</p>	<p>Holeta agricultural research centre (representing the Research system) as a key facilitator, Asela Malt Factory, Brewing factories, Regional Bureaus of Agriculture (zonal as well as district levels), Primary producer cooperatives, individual farmers, NGOs (in some areas like Arsi involved in organizing malt barely producers).</p> <p>In the southern part of the country, Kulumessa, Assela Malt Factory and Zonal and District Bureaus of Agriculture worked together to promote adoption of malt barley technologies in Arsi and Bale Zones.</p> <p>Promising effort is also being proceeding in Gonder by the Amhara Agricultural Research Institute. The major achievement made so far is meeting nearly all the Malt Factory demand from domestic production, thereby saving foreign currency that would have been spent for import of malt barley.</p> <p>Joint planning and responsibility sharing, resource mobilizations, promoting the production by granting quality from the research and</p>	<p>Malt barley technology, partnership with private, public and community, focusing on commodities of good market potential are important innovations. It is also understood that financial resources and knowledge are important elements where the research and the processing factory have respective strong drive for success.</p> <p>Key lessons learned include: availability of limited varieties with desirable factory quality requirements. That quality is largely influenced by environmental factors such as altitude, rainfall, and soil conditions as well as agronomic management practices. Associating pricing and contractual loyalty as well as timely collection of the grain from contractual farmers stimulates innovation and adoption of technologies.</p>

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			farmers side market from the factory side was instrumental for the success. The major driving force for the innovation is the market. There is scarcity of malt barely in the local market, increasing shortage of foreign currency to import, and growing number of breweries in the country to compete for this scarce resource.	
3	Dairy SNV	SNV Ethiopia is facilitating the dairy multi-stakeholder platform pursuing an upgrading strategy of diversified milk products and addressing identified bottlenecks related to quality systems for hygienic milk supply, a demand for quality processed and packed milk products, animal feed production and artificial insemination services and sector steering. eleven private sector processors with business planning, technical training for processing staff and other direct advice (private sector strengthening) and facilitates the development of business arrangements between processors and cooperatives involving 1500 dairy farmers (business to business) in out grower schemes with embedded services.	The process has involved a wider range of stakeholders from local producers and service suppliers through to the Ethiopian Milk Producers and Processors Association and government policy makers. An investment fund is facilitated for innovations and up-scaling value chain financing involving five companies and cooperatives. Furthermore, two cooperatives with 1800 members have been strengthened with business and financial management, and training producers on hygienic milk production and handling (producer group strengthening).	The case illustrates how bringing a range of stakeholders together can lead to opening up new market opportunities and overcoming blockages in the value chain that are stopping opportunities for small scale producers.
4	Honey SNV	SNV Ethiopia develops the capacities of private sector processors with business planning, HCAAP/ISO certification, product diversification (propolis, royal jelly, comb honey) and traceability (private sector strengthening) and facilitates the development of business arrangements between 8 processors and export partners and 8000 beekeepers (business to business) in out grower schemes with embedded services 2010: First regional coordination group organised by the Ethiopian Apiculture Board; honey value chain integrated in Agricultural Growth Strategy; honey export reached 109 tons and 400 tons is expected by the end of 2010.	. An investment fund is facilitated for innovations and up-scaling (value chain financing) involving 10 companies. Furthermore four beekeepers cooperative unions with 19,000 members are strengthened with management, business orientation and planning, Fair Trade Labelling Organisation certification, training in beekeeping skills and linked to formal markets, which resulted already in production increases of 200% of 1,160 trained beekeepers (producer group strengthening). EU Third Country listing and residue monitoring plan submitted and approved in 2008; introduction women friendly transitional beehives.	2009: Ethiopian Apiculture Board takes over the organisation of coordination group meetings from SNV-Ethiopia; out-growers-processors relationships strengthened with additional embedded services and linked to inputs reaching a critical mass of 8000 beekeepers; documented income increase of beekeepers of 150\$/yr.
5	Sesame GTZ	As part of the Ethiopian Engineering Capacity Building Programme (ECBP), GTZ has provide support for the sesame value chain. The aim of the ECBP is to improve the competitiveness of Ethiopian industries that have high potential for employment. This initiative has led to a substantial increase of sesame oil exports involving a significant number of small scale producers.	The main actors have been GTZ, the local exporters and the small scale producers. The driving force has been the opportunity for capturing a profitable export market	Mobilising and supporting local value adding and export businesses who then drive innovation with the other actors and small scale producers. The support provided by GTZ has been critical
6	Fruit grafting	Experiences indicate that the different agro-ecologies of the country provide suitable climatic and edaphic conditions to produce these fruit crops, which are in high demand both in domestic and international market. Major grafted fruits provided for smallholder farmers of Ethiopia are mainly orange, avocado, apple and mango. The technologies are primarily provided by Melkassa Agricultural Research Centre (esp. mango), apple growing cooperatives of Chencha in SNNPR as well as by certain NGOs largely for apples.	Agricultural research system which focuses on technology development, Regional Bureaus of Agriculture (focussing i=on extension), small holder farmers, primary producer cooperatives, Traders, NGOs, Universities, International Agencies (like ILRI through IMPS project, SNV, FAO, etc.) The current focus is on technology dissemination to increase production, capacity building for the extension staff and farmers. Efforts are a bit fragmented.	The major lesson is that fruit trees provide multiple benefits to the farmers including income, food and environmental protection. As the productivity of the crop increases and there is good market for the fruits, the adoption rate is high. Farmers participation in the innovation processes enhance knowledge sharing, and adoption. Market is crucial component for success. As fruits are perishable, value addition is crucial. This element is yet to be developed.

No	Name Location	Description and Impacts	Key Actors and Implementation Mechanisms, driving forces facilitation	Key Innovations and Main Lessons Learned
		<p>Jimma Agricultural Research Centre is also developing and distributing avocado seedlings to the neighbouring farmers. The centre also multiplies pineapple planting materials using tissue culture in partnership with private investors. The regional bureau of agriculture is playing a significant role in distributing the seedlings to needy farmers in suitable agro-ecologies. Universities, esp. Jimma university, are playing a key role in human resource development and knowledge creation.</p> <p>The positive impacts of adoption of these fruit crops include income generation and better household nutrition (esp. in terms of vitamins and minerals) as well as natural resource conservation on high sloppy areas, which otherwise are vulnerable to severe soil erosion. Adopters of fruit innovations are earning good income though market linkage and participation in value chain is the weakest</p>		<p>Farmers act on the lowest level of the value chain. Key constraints are shortage of planting materials and varietal options for different agro-ecologies as well as limited research experience and capacity in the country as well as weak value chain development, particularly in terms of post-harvest handling and quality.</p>
7	Zero Tillage	<p>Zero tillage, also known as conservation tillage, has predominately been promoted in Ethiopia by the SG2000 in partnership with research centres and regional bureaus of agriculture. The central aim is to minimize disturbance of soil structure, which otherwise leads to soil erosion by runoff water during the rainy season. The soil cover is first killed by using herbicides and planting is done with a minimum soil disturbance. After harvest crop residue is left on the farm to add back organic matter into the soil.</p> <p>The major impact is soil stability, use of labour for alternative purpose than for weeding, reduced need for drought power, a situation suitable when the environment does not favour oxen rearing and increased crop productivity in moisture stress areas. Zero tillage encompasses reduced cost of production and environmental benefits, without sacrificing yield.</p>	<p>The research system is the driver of this innovation. Programs implemented by non-government organizations such as SG2000, ILRI-IPMS, Regional Bureaus of Agriculture, farmers, input suppliers/ Traders (especially of chemicals) are key actors. ILRI-IPMS created the knowledge basis to provide alternative input supply (including chemicals) and established linkage with the input suppliers.</p>	<p>Key lessons include that zero tillage is more useful in increasing crop productivity in moisture stress areas than in areas receiving adequate rainfall. Indeed, in moisture stress areas, use of zero tillage is superior to use of chemical fertilizers in boosting crop productivity, probably because of the moisture conservation feature of zero tillage on one hand and the undesirable effect of chemical fertilizer under moisture on the other hand.</p> <p>Access to herbicides on time is the major constraint in sustainable adoption of zero tillage by small holder farmers. This innovation is used at smallholder level.</p>
8	Onion seed production	<p>Improved varieties of onion for seed production are largely provided for the seed producers by Melkassa Agricultural Research Centre (MARC). The centre is the source of innovation where government and non-government programs extend the innovation through capacity building. Farmers Research Group in the refit valley and around Melkassa and IPMS project beneficiary farmers in Amhara region are among the few examples involved in onion seeds production and marketing.</p> <p>Another impact is that the use of seed technology reduced the need for bulky bulbs of onion for planting. Labour need for planting is intensive contributing to increased rural labour employment. The seed multipliers benefited a lot from the financial income.</p>	<p>Research system, Regional Bureaus of Agriculture, business oriented farmers especially the youth, Traders and NGOs. Innovative farmers needed only the opportunity. The research/project has taken the drive to introduce the available technology, created knowledge with the farmers, showed the existence of demand for the product, and established market linkage so that the system worked.</p>	<p>The improved onion seeds are mostly produced in the Rift Valley and in eastern Hararghe where vegetables are commonly grown in Ethiopia and different parts of the country as minor products. The key lessons include the innovation system is driven by research and required varieties, knowledge and information are provided by the Melkassa Agricultural Research Centre through its extension research program using farmers extension group.</p> <p>Awareness about the seed technology was induced through development program. Then partnership between seed producer and farmers was demand driven and internal rather than externally induced. The increasing demand for onion in Ethiopia is a motivating factor for the onion seed production success benefiting those involved in the seed chain.</p>

No	Name Location	Description and Impacts	Key Actors and Implementation Mechanisms, driving forces facilitation	Key Innovations and Main Lessons Learned
9	Haricot Bean (	In Ethiopia, haricot bean technologies are mainly provided by Melkassa, Awassa, and Bako Agricultural Research Centres and Haramaya University. Haricot bean is one of the export commodities of Ethiopia. It is also important relish item in the Ethiopian daily diet. The crop is grown under different agro-ecology. It is also used as part of the crop rotation system to maintain soil fertility. Thus, as far as the productivity and price are attractive, the extension system has less pressure to extend the technology.	Research system, Regional Bureaus of Agriculture, business oriented farmers, local traders, exporters and NGOs. Market is the most important driving factor for the innovation uptake. Participatory approach which involved haricot value chain actors enhanced the innovation and its adoption. Some NGOs like the Catholic Relief Service provide financial resources for accessing the seed.	Partnership by the haricot bean chain actors enabled farmers to acquire knowledge to produce needed product quality for export. The varieties of haricot bean grown by the farmers are guided by agro-ecological suitability, demand (local consumption, local market or export) e.g. the farmers in the southern and south western Ethiopia produce haricot beans of different colours which are used for local market and consumption while farmers in the Rift Valley and eastern parts of the country produce white seeded haricot bean primarily for export. For the export haricot bean, there is good integration among technology generators, producers and local and export traders
10	JICA FREGs	JICA supported Farmers Research Group (FRG) have been implemented by Melkassa and Adami Tulu Agricultural Research Centres in the Rift Valley of Ethiopia. The FRG piloted in the area has been documented, guidelines prepared and being scaled up in all research centres in Ethiopia. The approach involves working with farmers, creating awareness of technology availability so that group of farmers try the technology themselves on their fields and choose the best fit, provision of inputs for the piloting, creating access to market information. Crop and livestock technologies and knowledge are key in the intervention. The FRG project created research capacity, enhanced significantly the adoption of crop and livestock technologies and promoted substantially diffusion of agricultural knowledge and information among researchers, farmers and between farmers and researchers. The major impacts include increased production and productivity of crops and dairy, increased marketable product, increased market participation, farmer to farmer technology transfer, improved income of the participants	Research centres, JICA, zonal and regional agriculture offices, development agents, farmers, Research, Extension Farmers Linkage Advisory Council (REFLAC). JICA provided technical support through assignment of professionals, researchers changed their approach of technology transfer and worked with farmers in a participatory manner, the farmers' knowledge given value and the system proved to be effective	Participatory technology promotion and evaluation with strong internal monitoring and evaluation is crucial for success. Giving place to farmers in the innovation process built the confidence in research results uptake. Due emphasis had also been given to capacity building in terms of facility building, logistics and human resource development. This indicates that technology, institutions and human capacity building are equally important to bring about tangible result. Documentation of best practices is a step for scaling up.
11	Flower Company (Florensis PLC)	Florensis PLC at Koka is a part of the Netherlands-based Florensis Company based in Hendrik Ido Ambacht. The company specializes in propagation of ornamental and flower plants cuttings, as well as plantlets raised from seed for the export market. The demand from the local market is largely from commercial farmers who rather pay for sound plantlets than risk having few plantlets surviving from expensive seed if they do it themselves, this demand concerns both plantlets from seed from vegetables, but also cuttings from passion fruits and others. Florensis has relations with a number of actors in the system: Banks; Regulatory authorities; Research, Ethiopian airlines; Universities; IPM input providers; Services of the Ministry of Agriculture; and the Environmental Protection authority. The Horticultural Development Agency in the Prime Ministers Office facilitates the interaction.	The Ethiopian Horticultural Producers and Exporters Association (EHPEA) is the platform, which could gradually take over the coordination in the sector. The Horticultural practical Training Centre at Melkassa is being established by the Ethiopian Horticulture Development Agency with technical assistance from WUR and JU and PTC+. The Centre will aim at capacity development of commercial producers. Florensis receives students for field attachments from Jimma and Hawassa Universities e.g. on testing different sorts of substrate (coco peat, coffee husk based peat etc.). Jimma University is particularly involved in the IPM research on trips and whitefly control. The interaction with smallholders or medium-scale producers is very limited and no competition for the enterprise mainly due to its high knowledge intensity is expected	Highly innovative sector based on external expertise and knowledge adapted with support of Jimma University. Interaction is the sector needs improvement, also due to poor facilitation. Very little interaction with smallholders and interaction with the public sector mainly through regulatory services. Universities have an important role in research and provide students, but it is not clear how and if the practical lessons are used in curriculum improvement.

No	Name Location	Description and Impacts	Key Actors and Implementation Mechanisms, driving forces facilitation	Key Innovations and Main Lessons Learned
12	Goat Farming in Sidamu	A farmer in Sidamu's Woreda Dorebafan, Kebele Tankakambulo, works with two MSc students (one on beans and nitrogen fixation, and one on agro-forestry in maize), both from Hawassa University (HU). He and his wife have adopted goat milk use (as a 'medicine' particularly for the children). He also adopted enset leaves feeding for goats, as a result of research with the HU. He and his wife have the main income from the sale of potatoes, beans and maize, goat milk is not sold, but sometimes goats. He gets some inputs (fertilizer, seeds) from the Woreda Office (no FTC), which he claims he has to pay cash, not being a cooperative member.	His contact with the DA is limited; his wife claims she has had no contact. The DA facilitated in a meeting with other farmers that he told his story about the goat feeding with ensete, so that others could learn from him. He has learned from other farmers the use of fertilizers and seeds. He himself tested different maize varieties and he has adopted the hybrid maize (BH 540 and BH 140). In general he relies mostly on his own and he claims to have learnt nothing from the DA. The market info he gets from the local market only. The wife has learnt on crops from women in other villages but not on processing.	Through interaction with the HU, the farmer has intensified his goat farming, but he does not produce milk for the market. The farmer is an innovator in maize production, after testing on his own. He and his wife learn from other farmers also on market orientation and information.
13	Bread Wheat	The research resulted in seed multiplication for selected varieties for bread wheat, which were multiplied by 133 farmers of the cooperative, and sold to members, also through the cooperative union. Specific learning moment was the failure to introduce durum wheat (market transaction costs low, low yields and low prices), while farmers wanted bread wheat varieties. Interaction with pasta factories, traders and NGOs could not resolve the durum wheat issue. Operational Research project was implemented through a consortium between Hawassa University, SARI, BoARD (now BoA) and Self Help Africa, supported by Irish Aid and an International Consortium (for backstopping). A MoU was developed between HU and the BoA; together they facilitated the interaction in the consortium. SARI tested the varieties; BoA did follow-up at village level; Hawassa University contributed with graduate students and capacity development of SARI staff; Self-Help Africa organized farmers.	Hawassa University participated in the Operational research project (funded by Irish Aid) in partnership with Self Help Africa (NGO), SARI (research), BoA, and farmers (eventually the Seed Cooperative). The following mechanisms were used in the interaction with other stakeholders in above mentioned case of introduction of bread wheat varieties: (i) Initial workshop in which it was decided that baseline and PRAs would indicate the priorities; (ii) Establishment of a taskforce (steering all activities) at Woreda level (Heads of sector Bureaus, NGO and Students); (iii) Use of University's own fund for funding project proposal; (iv) Council level (University and BoA for coordination); (v) development of scaling-up strategy. The University had the project coordination with two assistant coordinators (Hawassa Research Centre and College of Agriculture). Farmer organizations were not part of the consortium.	Apart from the adoption of the new bread wheat varieties by farmers, an additional outcome was that the regional seed policy was influenced through the use of the cooperatives for bread wheat seed production. All actors involved and notably those from the public sector (research, extension and universities) have realized the importance of involvement of the private sector based on the durum wheat experience. Based on PRA and the subsequent variety selection programme, special modules were developed for use in various course programmes. This was reinforced by guest lecturers. Undergraduates were exposed to the programme through short field attachments while MSc students were encouraged to do their MSc thesis in the programme. Students were also involved in some of the training activities at the FTCs.
14	Taro variety dissemination	The Southern Regional Research Organization runs four research centres in the region and collaborates with a Federal Research Centre. SARI has four research centres and some 100 scientific staff. In the region National Agricultural Research of EIAR also exists (Tepi) with e.g. spice research. The export crops in order of importance in the region are: Coffee, Skins and hides, Red beans, Spices (Cardamom, Coriander), and honey and wax, others such as essential oils are developing.	Introduction of a new TARO variety (Meloso 1), which after on-station (Areca Research) selection from local materials and testing on farmers' fields through RMRI trials (Research managed and research implemented) and RMFI trials (research managed and farmer implemented) was released through the National variety release committee. No relation with Unions and very limited with NGOs.	The variety was multiplied by FRGs, extension and some NGOs and spread like wildfire largely also through farmer-to-farmer contacts, even beyond the region and well before it was officially released by the national variety release committee. Farmers like it for its taste, and productivity
15	Dairy with extension	The BoA in the SNNPR, with support from ILRI, has developed a three pronged dairy development strategy i.e. the enhancing of: (i) milk production in urban and peri-urban areas; (ii) urban-rural links for milk and fodder trade; (iii) rural butter production and trade. Some of the major innovations the BoA staff referred to were livestock development in peri-urban areas (Artificial Insemination, and fresh milk sales, cut and carry fodder production) and rural areas (natural mating and breeding, butter production, improved grazing	Although the emphasis in dairy production is also on trade and marketing the interaction between BoA and the commercial private sector is non-existent. Links do exist with the cooperatives which are running the milk collection centres in peri-urban and rural areas. Other options for improved links are according to the BoA with the Hawassa University, such as e.g. on the technology village concept, which is being promoted by HU. Regular contacts existed in the context of the Operational research Project, but are now less.	The BoA's extension system has moved from the traditional T&V ('train and vanish') to the more participatory PADTES (Participatory Agricultural Demonstration Training and Extension System). Documentation of best practices has been done and some of these practices will be scaled up in the same agro-ecological zone.

No	Name Location	Description and Impacts	Key Actors and Implementation Mechanisms, driving forces facilitation	Key Innovations and Main Lessons Learned
		through supply of forage seeds) and the addressing of animal health as a crosscutting issue.		
16	Pineapple SNV	In the pineapple case a Consultative Group (CG) was formed some years ago. The platform organized the introduction of a new variety of pineapple with export or canning industry quality: Smooth Cayenne. The material was multiplied by Jima University in its tissue culture lab, but progress was so slow and the CG decided that it should go to private propagators (i.e. Alleje tissue culture lab based in, Mekelle, Tigray). At Woreda level the material is now being grown (18 months). Meanwhile a company in Nazreth has been found interested to process pineapples as slices and for drying, but has meanwhile gone bankrupt; another is being identified in Addis. Six private investors (one of which chairs the CG Pineapples) are investing in the plant multiplication, and possible processing.	The mechanism used for this is the Coordinating Group i.e. is a multi-stakeholder (chain actor group) group composed of: research, Private farmers and farmers' organizations/cooperatives, BOA/extension department, local traders, Financing institutions, Technical service providers, other NGOs, local platform representatives, etc. These CGs are facilitated by contracted local business development consultants, mainly from Addis, in collaboration with SNV staff. The CG meets initially every three months but presently only very six months. The chain development goes in two main, almost simultaneous steps: (i) Joint development of the production; (ii) link the wholesalers, processors, exporters for the required price arrangements.	The market research which is implemented by local consultants was financed by SNV. Who is going to pay for this in the long run (Public sector, Universities, the sector, rural finance institutions)? The CG is not likely to pay in the foreseeable future. In general financing is an issue. Cooperatives get financing from RFIs, Local traders from MFIs and Processors from Development Bank of Ethiopia. Up scaling approach to be followed: SNV and Mercycops are agencies that provide support for market linkages and value chain development coaching, but not many such agencies exist. The availability of local BDS is a major issue and constraint.
17	Hybrid maize seed	EIAR presents the introduction of hybrid maize varieties as a major innovation. Seed production was identified as a constraints and research has also gone into addressing the seed system constraint. Some of the most accepted hybrid varieties are BH 660, others are.....	EIAR in partnership with CIMMYT, MoA, Sasakawa G2000 and Ethiopian Seed Enterprise and other seed producers identified seed production for the new hybrids as one of the major constraints. Large-scale farmers (e.g. Jittu Horticulture), but also Alage ATVET training centres, were seen to be producing hybrid seed.	Farmers get access to hybrid seed through the cooperative system, reaching some 40% of farmers. One farmer visited acquired the hybrid maize seed himself after having tested the different varieties on his farm, even without being linked to a cooperative.
18	Small scale private service provider	In its programme on capacity development of farmers and private sector partners, ILRI's IPMS programme has introduced the concept of the small-scale service provider. Training is targeted at specialized producers of inputs for some of the main commodity chains.	The small-scale service providers the programme focuses on: (i) nursery operators for fruits and coffee; (ii) seed producers for cereals, beans/pulses and vegetables; (iii) paravets; (iv) private crop spraying; and, (v) irrigation pump maintenance. IPMS also provides for training in small-scale dairy and agricultural processing and retail marketing.	In Halaba the programme is successful in the sense that now privately operating crop protection service providers are operating, who spray for a fee. The initial experience with this type of small-scale private services was the paravets. The programme is supported through the FTC Halaba. Small-scale business development services provision responds to an existing demand.
19	Curriculum change in ATVETs	The Alage ATVET enrolls 4500 students (11% females) and has trained over 17000 DAs for a three year course (2 years theory and 1 year practical training). Although providing short courses for third parties is an option, so far only 39 NGO students have been trained. Based on the operational standards of the Ministry of Education, the curriculum has been changed from an input-oriented curriculum to an outcome-based curriculum, based on competency-based learning. The new curriculum is particularly meant for the post-DA capacity development period, in which the focus is on self-employed graduates, with emphasis on agribusiness development and entrepreneurship development.	ATVET has no formal linkage with universities nor with FTCs, but in particular with the latter many informal contacts exist. Alage ATVET is part of the Ministry of Agriculture (BoA), but follows the operational standards of the Ministry of Education. The BoA is involved in the demand analysis and needs assessment on which the new curriculum is based.	Although the new curriculum is presented as an innovation, it is not yet put into practice due to delay in the start of the new outcome-oriented course programme. The delay is caused by the fact that the number of DAs is not yet sufficient, also due to the high annual turnover of 10% (i.e. between 4500 and 6000 graduates) Change to outcome oriented curriculum Skills (on facilitation) development and self-employment orientation, as well as agribusiness orientation are already part of some of the short courses, but are not yet part of the DA courses, while this is the new way of working of DAs in the Agricultural Growth Programme
20	Honey production in Oromia	ILRI through kits IPMS programme introduced transitional and modern hives for beekeeping in areas with a high potential for commercial beekeeping. IPMS also introduced a new way of processing the honey combs	The programme was integrated in the sense that the emphasis was not only on production (new beehives) and value chain development (enhanced processing). Different cooperative and private enterprise models were used for the marketing of the honey and the wax and to supply the inputs. Credit was also provided for	The introduction of the new technology led to innovation in beekeeping due to: (i) Area had potential for commercial beekeeping and demand for improved apiculture technologies; (ii) Farmers were trained in manufacturing the beehives, and, (iii) Interaction took place with all actors in the honey and wax

No	Name Location	Description and Impacts	Key Actors and Implementation Mechanisms, driving forces facilitation	Key Innovations and Main Lessons Learned
21	Carrots for the urban market	Small-scale farmers near Lake Hawassa have started growing carrots for the urban market. The easy access by a good road to Addis has made this trade possible.	the stimulation of the input supply system Director research gave this as an example of an innovation which was completely triggered by the market. Traders from Addis have not provided the market incentive to farmers, but also supply them with seed and advice on growing and processing (bundling and washing in Lake Hawassa)	innovation system. Nice illustration of a market triggered innovation, without any interference from research or extension. The important element is also that this is perceived as such by both public research and public extension.

## Appendix 2 – Persons Met

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## Appendix 3 – Cases from Sub-Saharan Africa on Agricultural Advisory Services

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### Ghana: Early adopter of liberalization and privatisation for delivery of extension services

#### *Background data*

In Ghana the agricultural sector contributes some 36% to the GNP. Agricultural production accounts for more than 50% of foreign exchange earnings, being cocoa, cotton and timber amongst the most important commodities. Family-operated farms employ 70% of Ghana's economically active population and produce 80% of the total agricultural production.

Ghana possesses a wide range of agro-ecological zones and soils suitable for arable cropping in the northern regions and permanent crops in the south. A large variety of crops is grown and if a strategy of regional differentiation is according to ecological suitability is applied the potential for area expansion is promising. Nevertheless, in the comprehensive Report on Food security & Vulnerability analysis WFP states (2009) that 5% of the Ghanaian population (1.2 million) has very limited access to sufficient and nutritious food; 35% of the rural population is below the national poverty line, most of whom are dwelling in the northern regions. Major constraints to accelerated development in that part of the country are deficient infrastructure, limited alternative income opportunities and smallholders lack proper technologies for production under low rainfall conditions.

Growth in agriculture is necessary to stimulate growth in other sectors of the national economy. Increasing productivity in agriculture must play a central role in rural poverty reduction, and this is particularly important in the more remote areas where poverty levels tend to be highest. Improvement of the rural infrastructure can play an important role, just like promotion of trade, reform of land tenure customs and legislation, and improved access to production inputs for smallholder producers.

#### *Innovation in the Agricultural Sector*

From 1990 onwards the DAES<sup>1</sup> introduced the T&V system through the National Agricultural Extension Project (1992-1999)<sup>2</sup> aiming at more efficient management of service delivery, enhanced relevance of the (technological) extension subject matter and to strengthen the technical departments of MoFA. Parallel to NAEP, there was also a national project on Agricultural Research<sup>3</sup> aimed at improved production technologies through development of the agricultural research system. Whilst T&V was abandoned under pressure of Structural adjustment, DAES is experimenting with extension approaches like PTD and FFS with backstopping from agencies like FAO and GTZ, whereby Agricultural Extension Agents facilitate learning among farmers in addition to their tasks to supply information and to give instructions on improved production practices.

Introduction and use of ICT for extension seems to be promising: the cell phone density in Ghana is the highest in Africa and there is already quite some experience accumulated from previous projects. MoFA makes a continuing effort to integrate ICT into its extension advisory services and in several districts

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<sup>1</sup> Department for Agricultural Extension Services.

<sup>2</sup> NAEP; by World Bank funding.

<sup>3</sup> NARP (1991-1999).

information centres provide agricultural information using ICT. Many NGOs and research organizations use ICT in the effort to make their extension efforts more effective and efficient.

### *Networks and alliances*

Enhancing market-oriented agricultural production is one of the main goals of the Agricultural Extension services in Ghana. However, the performance of public or private extension services is only one factor in the complex reality of agricultural and rural development and it rarely is the most decisive component to influence the farmers' decision-making.

In 1991 Research Extension Liaison Committees (RELC) were created in the five major ecological zones to upgrade the relevance and quality of research and extension programmes. These RELCs have played an important role in forging a link between farmers, extension staff and researchers, and in staff training. However, little progress was made in developing the capacity to differentiate farmer needs in a location-specific way accounting for the constraints and conditions farmers are facing in the various districts or regions.

For long, both public and private extension advisory services have focused almost exclusively on production and farm management: both vital issues in the livelihood strategies farm families apply to secure their existence. However, extension service providers should take into account that the institutional context in which farmers live and work is at least as important as, if not more important than increases in productivity that can be brought about by adoption of technical innovations. For more sustainable impact, the services provided should be better attuned to the complex reality farmers have to cope with. Extension efforts to boost farmers' capacity to organize themselves in groups can be seen as a first step in that direction.

CIDA coordinates donor support to the agricultural sector in Ghana. In addition to programme support as well budget support about USD \$ 22 million is earmarked to improve extension services for adoption of new technologies (- originating from CSIR -) with a rather limited rate of success.

### *Policy environment*

Under the Accelerated Agricultural Growth and Development Strategy (AAGDS) the average annual growth rate for the agricultural sector between 1997 and 2007 was set at 6%. In line with CAADP, the Government decided to increase the budget for Agriculture to boost investment in the sector to just over 10% of the total budget between 2003 and 2008 and the development plans for the food and agricultural sector (FASDEP). In June 2003 DAES issued policy guidelines to develop agricultural extension with a range of stakeholders from the sector. The strategic objectives for FASDEP II<sup>4</sup> are:

- Food security and emergency preparedness
- Improved growth in incomes and reduced income variability
- Increased competitiveness, enhanced integration into domestic and international markets
- Sustainable management of land and environment
- Science and technology applied in food and agriculture development
- Enhanced institutional coordination

Investments certainly increased, but the 6% annual growth rate aimed at was not achieved<sup>5</sup>. Recalling previous changes in the national economy since the 80-ies (market liberalization, decentralization of

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<sup>4</sup> Five categories are distinguished : large-scale commercial farmers, small commercial farmers, semi-commercial farmers, non-poor complex diverse risk-prone farmers, and poor complex diverse risk-prone farmers.

<sup>5</sup> 53% of the resources were spent on recurrent expenditure and only 47% on investments. How much of the latter volume was made in favour of the smallholder farmers could not be traced.

governing structures, increased participation of the private sector in service delivery, and a focus on poverty reduction) the policy objectives cover four main categories:

1) Promoting farmer demand-driven extension, 2) Enhancing efficiency and effectiveness of management and operation of agricultural extension; 3) Capacity building in extension, and 4) The need for agricultural extension to encompass emerging issues.

### *Institutional conditions*

It seems that at policy level the importance of the institutional setting which dictates the conditions in which farmers have to operate is clearly acknowledged. In 1997 District Assemblies were put in charge of administration and supply of agricultural extension services, but the mandate for policy planning, coordination, M&E and technical backstopping stayed with the Regional Departments of Agriculture and MoFA at national level<sup>6</sup>. For more than a decade now, policy guidelines are consistently indicating in which way extension services should be developed: extension should be responsive, needs- and client oriented, and demand-driven. Extension workers should apply participatory, systemic, holistic approaches, using methods that stimulate ownership, transparency and accountability, with a focus on capacity building and organizational skills. However, the mandate and the volume of resources, equipment, financial means and staff capacity made available at operational level reveal that – also quite consistently - policy goals are not backed up by adequate follow-up measures thus leaving the ungrateful task to the extension field staff to achieve the goals set without the necessary means to do so.

Agricultural extension is acting in an institutional context, and to be effective the suppliers of extension services should take this context into account, if they strive for sustained impact. Most probably this is the biggest challenge for all parties involved in the design, implementation and operation of extension advisory services in Ghana.

### *Drivers for change*

Since the Economic Recovery Programme in the early 80-ies, the national development policies continuously advocated promotion of the private sector to provide support services and redefinition of the tasks of government in order to stimulate, enable and facilitate the sector to do so. At present, the private sector contributes some 22% to the GDP. Government strategies to develop the private sector seek to create a favourable investment climate and enhanced competitiveness of Ghana's businesses, which largely consist of micro, small and medium-sized enterprises<sup>7</sup>. Such enterprises constitute the main source of employment and income for most Ghanaians<sup>8</sup>. The importance of the MSME is enormous and policy makers see strengthening MSMEs as top priority to poverty reduction and economic empowerment.

### *Financial sustainability*

Over the last decade the private sector got more involved in provision of extension advisory services. At present, many extension activities are implemented as projects by private consultancy enterprises, project

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<sup>6</sup> In 2003 the DA authorized the producers recipients of the extension advisory services to monitor service delivery as a mechanism to warrant its quality.

<sup>7</sup> NBSSI classification: micro-enterprise (1-5 workers), small-scale enterprise: up to 29 workers; medium enterprise: 29 – 99 workers; large scale enterprise; employing 100 workers or more (source: Private enterprise foundation, 2009).

<sup>8</sup> Small-scale and micro-enterprises comprise 96% of all private manufacturing businesses, medium scale enterprises comprise 3%, and large scale enterprises 1%.

management units or national or international NGOs with funding and various degrees of technical assistance from international donor agencies (like e.g. MOAP, TIPCEE and ADVANCE)<sup>9</sup>.

For specific commodities (like cocoa, mango, pineapples, high value vegetables, rice and maize) producer organizations, processing units and export companies and buyers offer extension services on cost-recovery basis, deducting service charges from payments to farmers at the time of sale. Also promotion and operation of the nucleus farm production mode whereby smallholders in the vicinity of a bigger farm sell their produce to the bigger production unit, facilitates the dissemination of production advice. This type of advisory services tends to focus on high-value crops like cocoa, cotton, oil palm, cashew, pineapple, other fruits and vegetables.

The level of success achieved by the three aforementioned programmes is heavily dependent on intensive collaboration between the national Government institutions involved, the national private sector and NGOs, and international development support agencies. Also, external financial support from international agencies sustained over a long period of time is essential the outcomes of these sector-wide development efforts to strengthen the agricultural sector.

Extension services could improve their performance if its staff would be able to build effective linkages with the functional FBOs in the various districts in Ghana. Formation of farmer groups and associations however should not be promoted as a goal in itself, as seems to have occurred quite often in the past unfortunately. Such organizations are a means to an end, and extension staff should be properly trained and knowledgeable on how to contribute to effective empowerment of the farmers.

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<sup>9</sup> MOAP: market-oriented agricultural programme (2004-2013) supported by GTZ and DED.

TIPCEE: Trade & Investment Programme for Competitive Export economy (2006-2009) sponsored by USAID.

ADVANCE: the Agriculture Development & Value Chain Enhancement project (2009-2013) funded by USAID.

## Agricultural advisory services provided in Mozambique by the public sector, the private sector

### *Background data*

Mozambique is a subtropical country with a surface area of 799,380 km<sup>2</sup>. Between 1992 and 2003, average annual growth in agricultural GDP reached 6.2 per cent, well above the level for most African countries. However, crop production, mainly rainfed, is subject to significant periodic fluctuations due to droughts and floods.

Approximately 65 per cent of Mozambique's population and 80 per cent of the nation's poor live in rural areas. Between 1997 and 2003, the national poverty incidence declined from 69.4 per cent to 54.1 per cent and the poverty gap was reduced from 29.2 per cent to 19.9 per cent, implying that also those who remained poor increased their consumption. Poverty in rural areas was reduced by 16 points from 71.6 per cent to 55.2 per cent, while urban poverty incidence declined by 12 points from 63.9 per cent to 51.6 per cent. Among farmers, the poverty incidence fell from 72.6 per cent to 58.2 per cent. By 2010, an estimated 2 million people will be infected, reducing life expectancy to some 37 years as compared with 50 years for those without AIDS.

Agriculture (including forestry and fisheries) has the lowest sector share of GDP (23 per cent), which is unusual for a low-income country. The services sector is the biggest contributor to GDP (47 per cent) followed by industry (30 per cent). Despite the relatively modest contribution of agriculture, the sector employs about 80 per cent of the population, an indication that agricultural productivity is very low compared with productivity in other sectors. Mozambique's average annual public expenditure on agricultural development was estimated at 3.5 per cent in 2007 and 7.5 per cent in 2008, i.e. less than the target of 10 per cent agreed at the Ministers of Agriculture of the African Union Conference in Maputo in 2003. Annual official development assistance (ODA) commitments in Mozambique averaged US\$900 million during the 1990s; since 2004, they have averaged US\$1.3 billion, of which about one third is provided by multilaterals. In the period 1996-2006, only 5.6 per cent of ODA was dedicated to agriculture (including forestry and fisheries). However, a part of the General Budget Support (GBS) is also being dedicated – through the national allocation system – to agriculture and rural development (IFAD's country evaluation 2009).

### *Innovation in Mozambican agriculture*

The far majority of farmers (99%) are smallholders (3.2 million), others are medium-scale (10 000) commercial farmers and large scale commercial farmers (600), often estates and large companies. Of the smallholder farmers only a minority (22%, Extension Master Plan) is considered to be an emerging farmer to some extent market-oriented, using improved seeds, using fertilizers or having Access to extension. Some 33% of the smallholders is not yet emerging, while 45% are the poorest subsistence farmers with a non-agricultural income source larger than agriculture (TIA, 2008). Examples sectors that has been most innovative in recent years and have shown to be competitive is the cashew value chain and the sesame value chain, these innovation process have been driven by the private sector and NGOs.

### *Networks and alliances*

An important instrument in fostering innovation through coordination is the formation of the National Innovation Platform between all agricultural research organizations (Ministry of Agriculture, Universities and International research), as well as the National Extension Directorate and other actors). The aim of this platform is also to coordinate platforms for major commodities with wide stakeholder participation. This has however hardly been realized yet. The extension system has become pluralistic in the sense that roughly one third of extension officers are from the public sector (district-based officers from the Ministry of Agriculture), one third from NGOs (including from farmer organizations, all mainly operating at District level) and one third from the private sector (tobacco companies, cotton and cashew sectors and others).

One national annual meeting brings all these stakeholders together, mainly for very general coordination and lessons learning purposes. Real coordination between all types of extension service providers takes place at district level. At the district level the district advisory councils are composed of farmer representatives and other district level actors, also from the private sector, which advise amongst others on extension priority setting, investments and coordination. Interaction between public research and extension (public and private) takes place mainly at zonal and provincial level through the Zonal Agricultural Research Centres (covering about 3 provinces each).

### *Policy environment*

Mozambique's Science, Technology and Innovation Strategy (MOSTIS) (GoM, 2006) aims at fostering a culture of innovation throughout Mozambican society, it aims at the following main outputs (i) Popularizing science and technology throughout Mozambican society, enabling Mozambicans to feel confident in participating in the knowledge and technology-oriented global society; (ii) Promoting an entrepreneurial outlook and innovative orientation throughout the S&T system; (iii) Bringing awareness of science and technology and their role in innovation. To this effect the national agricultural research strategy and the national extension master plan of the Ministry of Agriculture have both adopted innovation systems principles. In the Extension Master Plan innovation system facilitation is considered one of the main tasks of the extension system. This to be achieved through a gradual transformation of the extension system from a teaching mode to a facilitating mode, from technology oriented only to market-oriented and business plan development mode and from top-down extension planning to demand driven, district-based extension systems.

The main principles applied in the extension system are: decentralization (extension budget part of district budget and subject to budget planning); deconcentration (national policy and regulatory support and M&E for learning: provincial coordination and technical support, district level planning, implementation and M&E); pluralist extension system (coordination at district level between all extension, public, private and civil society); outsourcing (contracting in specific services which are not available in the public system); partnership (extension develops partnerships with other actors in the innovation system: financial services, market parties and research); farmer empowerment (support for association formation and involvement in planning, resource allocation and extension); extension approaches (increasingly based on facilitation of learning processes as in the Farmer Field Schools).

### *Institutional conditions*

In general support for smallholders at district level remains limited. Services are improving, access to financial services is improving through the District development Funds, but market transaction costs remain high (poor local infrastructure), policy environment is sometimes poor and urban-biased (e.g. recent abolition of rice import duties as a reaction to the food riots), while local business development services are hardly available. Farmers are often member of an association, but 'modern' cooperatives are few, and although credit and savings associations exist widely, these have remained informal and have not developed into SACCOS on which basis a cooperative bank could be formed. The national farmer organization (UNAC) is as a lobby organization politicized and does not play a major role in lobbying for an economic enabling environment for smallholder farming.

### *Drivers for change*

Examples sectors that has been most innovative in recent years and have shown to be competitive is the cashew value chain and the sesame value chain, these innovation process have been driven by the private sector and NGOs. Particularly in the cashew sector the policy environment has been crucial for the restart of the national, relatively, small-scale cashew processing units. The general main driver for change remains the market, the fact that cotton prices remain low and sesame prices are good, will the chain has managed to adapt to market demand led to relative fast change from cotton to sesame for most northern farmers. In general the private and NGO extension officers are operating more market oriented often in a certain value chain, while the public sector is still mostly production oriented.

### *Financial sustainability*

In order to make available investments for local economic development at district level (not available due to the absence of a rural development bank) has made considerable amounts of funds available through the District Development Funds in each of the 128 rural districts. Farmers and farmers' associations can access these credit funds (at 10% annually) on the basis of a presented business plan, which needs to be in line with the District Strategic Development Plan. Extension officers (both public and private) play an important role in facilitating the development of these plans. The National extension programme has had some limited experience with contracting in services (outsourcing), and is planning to expand this facility to each district. Services can then be contracted in on the basis of complementarity (e.g. more market-oriented services) and based on identified needs at district level.

The public extension system itself is financed through the agricultural sector plan and through district level funding (as part of the district budget from the treasury). Sometimes public extension is co-financed by NGOs and private sector. Limited or no experience exist with fee-based extension, but a large number of farmer service providers are involved at district level, who get payments from farmers for services provided (cashew spraying, chicken vaccination, farmer field school facilitators, etc.).

Capacity development (main emphasis of the national programme) remains the main challenge for the sustainability of the district level extension programme both in terms of extension management and coordination, service provision (in public and private sector, market-orientation, facilitation, etc.) and empowerment of farmer associations in economic activities and district-level participation.

## South-Africa: Overhaul of public extension services and public-private partnerships to provide extension advisory services

### *Background data*

In South-Africa primary agriculture contributes about 2.6% to the GNP and almost 9% of formal employment, whilst the agro-industrial sector is estimated to comprise 15% of GDP. The agricultural sector is characterized by about 50.000 commercial farms using about 80% of the total cultivated area for their production activities rendering some 95% of the marketed output officially registered.

About 13% of South Africa's surface area can be used for crop production, of which just 22% can be classified as high-potential land. The most important factor limiting agricultural production is the availability of water: 90% of South Africa can be regarded as arid, semiarid and dry sub humid, and in these areas desertification can occur. Rainfall is distributed unevenly with almost 50% of water being used for agricultural purposes. Some 1.3 million hectares (ha) are under irrigation.

In general, South-Africa can meet its own food requirements, with considerable food exportation. Agricultural exports contribute on average approximately 8% of total exports. The country is self-sufficient in primary foods, except for wheat and oil-seeds. However, the inherent limitations of the natural resource base and variable climate require land users to be very circumspect in how they use and manage these resources so as to retain their productive capacity.

The largest area of farmland is planted with maize, followed by wheat, sugar-cane and sunflowers. Maize is the largest locally produced field crop and most important source of carbohydrates for human and animal consumption. Average production per year is approximately 9 million tons, of which some 7.4 million tons is locally consumed.

Livestock is common in most parts of South Africa. The latest estimates for cattle and sheep are 13.5 million and 28.8 million respectively. South Africa normally produces 85% of its meat requirements. The dairy industry is an important employer with 4,300 milk producers employing about 60,000 farm workers and indirectly providing jobs to some 40 000 people. Milk production for 2001/02 was estimated at 1.97 ml.

Poultry meat production is estimated at 980 000 t. The gross value of broilers and other fowls slaughtered in 2001 was some R9.3 billion, which makes it the most important contributor to the value of agricultural production in South Africa.

The largest export groups are raw sugar, fresh grapes, citrus, nectarines, wine and deciduous fruit. Other important exports include avocados, plums, maize, black tea, groundnuts, meat, pineapples, tobacco, wool and cotton. Deciduous fruit export earnings account for 15% of the country's total earnings from agricultural exports.

South Africa has an essentially dual agricultural economy, comprising a well-developed commercial sector and a predominantly subsistence-oriented sector. While commercial agriculture became gradually more and more capital intensive, large numbers of people were excluded from the benefits of modernisation. Among the rural population living in regions where this large scale modern agriculture is being practiced there are some 3 million small scale farmers with an average farm size of less than 200 ha. Together, these smallholders occupy 13% of the total cultivated area and they earn about 10% of their total household income from selling agricultural products.

Excluded from the commercial land market, in the former homeland areas there were hardly any opportunities to make a decent living through farming. Most rural people were unskilled farm workers, employed in the industrial and service sectors as migratory workers or left the countryside to go and live near the centres of urbanization.

### *Innovation*

This situation calls for a huge effort in terms of capacity building, training and education and R&D that meets broader economic and social objectives. Applying the ARD approach requires a collaborative effort to build the competencies (knowledge, skills and mindsets) that professionals in the sector need, accomplished by collective (rather than individual) involvement; focusing on problem solving capabilities; creating an interface between disciplines and institutions (research, extension, farmers) and integrating practical field investigation through action research.

### *Networks and alliances*

The policy environment is in favour of ARD focusing on strategic alliances, integrating rural services, lower production cost and supply chain agreements, but improvement in rural livelihoods is limited. Most institutions and organizations seem to be willing to network or enter in alliances only occasionally and on their own terms. Lack of effective regulatory mechanisms to assure compliance with the legislation ruling contracts and partnerships, and acute shortage of competent staff are serious obstacles to overcome, aggravated by lack of accountability and transparency in collaboration agreements.

### *Policy environment*

The social, political and economic conditions prevalent in the past have set the scene for the challenges South-Africa is facing nowadays. A major policy objective is equitable access and participation in a globally competitive and sustainable agricultural sector; with as priority focus area transformation of research, technology transfer and specifically Human Capital Development. The top priority for the agricultural sector is to support the emerging black farmers in such a way that they can become active producers in the commercial farming sector. The provision of good quality extension advisory services plays a major role in this endeavour.

Since 1994, when the agriculture sector was deregulated, the structure of agribusiness has changed substantially, with many co-operatives transforming themselves into private companies. Several processes have reversed the impact of discriminatory legislation, while other initiatives have deregulated and liberalized the sector. The main policy shifts include:

- Liberalizing agricultural trade and deregulating the marketing of agricultural products
- Implementing land reform policies and programmes<sup>10</sup>
- Abolishing certain tax concessions and reducing direct subsidization
- Introducing a minimum wage for farm workers.

At present the government is not in a position to provide the enabling environment which needed by the public sector, the private sector and the civil society to forge alliances. Institutions and networks already in existence are most interested in securing their turf, defending vested interests and hesitate to engage in new initiatives which might be threatening their position.

### *Institutional conditions*

Household food security and poverty alleviation are both very critical for the development of the agricultural sector in South-Africa. The Government is promoting the establishment of a framework for partnerships to implement Land Reform and build farm production skills among the beneficiaries of this policy. The key action initiatives are taken up by the Farmer Support & Development (FSD) divisions of the Provincial Directorates for Agriculture and Rural Development. FSD tasks include:

- (i) Post-settlement support to beneficiaries from land restitution, redistribution and tenure reform

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<sup>10</sup> The Government target is to have transferred 30% of the agricultural land to formerly disadvantaged South Africans by 2020.

- (ii) Preferential support services for emerging farmers from groups previously disadvantaged who gained access to land by purchase, rentals, bequests etc.;
- (iii) Design and implement innovative development programmes for people farming on communal lands to become successful producers;
- (iv) Stimulate experienced farmers to contribute to mentorship programs, partnerships, joint ventures, joint planning and monitoring in programmes for capacity building.

The National Department of Agriculture exercises control over the utilization of South Africa's natural agricultural resources. Legislation provides for the conservation of natural agricultural resources through maintaining the land's production potential; combating and preventing erosion; and protecting vegetation and combating weeds and invader plants. Specific requirements and prohibitions apply to land users, and certain activities, such as the cultivation of virgin land and burning of veld, are subject to prior approval, while others are prescribed as 'best practice' in the interest of sustainable land use. In order to promote natural agricultural resource conservation, policies, norms, standards and guidelines have been developed.

In general, there is shortage of extension field staff. The switch from the pre-1994 extension support focusing capital and technology intensive, large-scale farming to giving priority to emerging farmers benefiting from the Land Reform required a radical change in vision from the extension staff. It also implied a switch in terms of the type of clients, the extension subject matter to deal with, and the methods to be used and thus in terms of skills, competences and experience. The advisory services need a dramatic overhaul, and there is hardly any stock of proven technology or procedures readily available. The number of staff available is far below the level required and institutions for agricultural education, training and agricultural research are poorly prepared or equipped to make such a shift. To tackle some of the most urgent bottlenecks, the National Government developed an advanced system of Public-Private Partnerships. The out-sourcing of a wide array of agricultural support services is a quite common phenomenon also frequently used in extension.

### *Drivers for change*

The National Government has launched a series of support programs, like LRAD<sup>11</sup>, AgriBEE<sup>12</sup>, CASP<sup>13</sup>, MAFISA<sup>14</sup>, LARP<sup>15</sup> and the National Land Care Programme (NLP)<sup>16</sup>.

- Promoting collaboration between ARC, University Faculties of Agriculture, Provincial Departments of Agriculture, agribusinesses and other agricultural research institutions to refocus on strategic priorities, innovation and adaptive research
- Establishing the National Agricultural Research System to integrate, coordinate and link its research with industry and international agricultural research and extension services
- Re-evaluate the funding basis to promote partnerships between agricultural research institutes, universities and the private sector

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<sup>11</sup> Land Redistribution for Agricultural Development is aimed at transfer of 30% of the cultivated area to emerging black farmers

<sup>12</sup> Agricultural Black Economic Empowerment policy is a policy framework setting guidelines that promote redistribution of economic opportunities among farmers stimulating the participation of previously disadvantaged Black producers in the mainstream agriculture

<sup>13</sup> the Comprehensive Agricultural Support Programme to promote infrastructure facilities

<sup>14</sup> Micro Agricultural Finance Institution of South-Africa

<sup>15</sup> Land and Agrarian Reform Programme

<sup>16</sup> Land Care is implementing integrated approaches to NRM which are efficient, sustainable and equitable.

### *Institutional conditions*

In the South-African economy the value chains in agriculture are quite well developed, and a vast array of service providers is available offering services ranging from highly specialized technological subjects, input supply, and contract farming, to farm management support, marketing, credits, insurances, loans, auditing, business administration and development. However, it is common to find a mismatch between the services supplied and the services that are really needed.

FSD extension agents, employed by the government, are mostly fully absorbed by advising the emerging farmers on how to qualify for government sponsored support programmes to build farm infrastructure, or providing guidance in how to acquire some farm management skills, to start up some kind of farm administration or where to find specific inputs.

### *Financial sustainability*

Investment in agricultural research, education and extension will be raised to meet the international benchmark of 3 % of agricultural GNP. This must lead to increased investment and use of the most advanced and recent products from research, training and extension systems. By implementing this strategy the sector endeavours to use primary research and relevant education programmes to promote new and strategically important technologies, (biotechnology, information, communication) and a range of value-adding technologies to extract future value.

In 2008 the national government has launched a nationwide Extension Recovery Programme for the 2008-2011 period with million Rands funding.

The Department of Agriculture funds the National African Farmers' Union's (NAFU) capacity-building programme. Further funding is provided by the United States' Department of Agriculture. Co-operatives aimed at economic empowerment are also co-coordinated by the Department. To consolidate gains and address remaining weaknesses, the departments of Agriculture and Land Affairs, in collaboration with NAFU and Agri SA, have developed a common long-term vision of a united and prosperous agricultural sector.

## Building of a national market oriented agricultural advisory service system in Rwanda

### *Background data*

Rwanda is situated close to the equator but has a temperate tropical climate as a result of its altitude between 1,000 and more than 4000 meters above sea level. Rwanda has a bi-modal rainfall pattern. Rainfall ranges from about 900 mm in the east and southeast to 1500 mm in the north and northwest volcanic highland areas.

Farmland covers roughly 1.3 million ha of Rwanda, about 50% of the total territory. 4% is under cash crops (coffee and tea), 67% food crops, 10% forage, 10% trees, and 7% fallow.

85% of households derive their livelihood from agriculture directly, of which 27% is female headed. For 56% of these households agriculture is their only activity. The average age of the head of the household is 44, average household size 4.9 persons, of which half is 'active'. Literacy of agricultural producers is 64%.

Average farm size is 0.76 Ha, distributed over 4 separate plots. Land is mainly acquired through inheritance (46%), purchased (25%) or acquired as gift from the government (7%). Almost all land is on hillsides (82%), close to the homestead and non-irrigated (98%).

The agricultural system of Rwanda can be characterized by intensive intercropping on small farms of bananas, roots and tubers (potatoes, cassava, sweet potatoes and some taro), beans and cereals (maize, rice and sorghum). Furthermore coffee and tea are grown for export, while horticulture, mainly for home consumption and the domestic market, is becoming of increasing importance. Of the total agricultural production in the country, calculated in caloric value, 45% is roots and tubers, 13% cereals, 17% pulses, 19% fruits and 5% others. The crop mixture adopted by farmers depends largely on their agro-ecology, in which altitude, rainfall and irrigation, and slope versus valley bottom are the main deciding factors.

Use of external inputs is fairly low with 17%, 9% and 26% of producers using any chemical fertilizer, improved seeds or pesticides respectively.

Animal husbandry is practiced in some form by 70% of agricultural households. 42% of households owning small animals (mainly goats), 34% cattle, and 17% poultry.

Roughly half of Rwandan agricultural households reported experiencing difficulties in assuring food self-sufficiency.

*Source:* National agricultural survey 2008 (NAS 2008): Report of national data analysis. National institute of statistics, Rwanda.

### *The innovation approach & best practice(s), actors and client groups involved*

Recognizing the importance of agriculture for the Rwandan economy the ministry of agriculture and the Belgium Technical Cooperation (BTC) are invested in the development of the system of agricultural advisory services.

A system has been piloted in 8 of the 30 districts from 2007 till 2010. A country-wide programme, based on the lessons of the first phase has been formulated and is currently being initiated.

The proposed programme aims to:

- Institutionalize demand articulation for capacity building and innovation in agriculture through district committees
- Develop financing and accountability mechanisms for local capacity development efforts through district committees and district government
- Create a critical mass of local advisory service providers to respond to these demands
- Professionalize the supporting role of the Rwanda Agricultural Board (RAB) of the ministry of agriculture to local advisory service providers

District stakeholder platforms at district level will play an important role in organizing the demand articulation for advisory services. Furthermore the platforms will select service providers to respond to these demands. In case required services cannot be delivered by a lack of service providers, training methodology or knowledge, the demand is transferred to the zonal agricultural advisory service teams.

The local government will execute the contracting of local service providers selected by the platforms and bear financial accounting responsibility, as well as the response to these demands through

At zonal level (Rwanda has 4 zones) a specific team of researchers and extension specialists (the zonal agricultural advisory service or zonal AAS team) will support the quality of advisory service provision. They will take responsibility for the development of training methods and materials, training of trainers, pilot implementation and monitoring of effectiveness. Besides responding to demands articulated through the district platforms the AAS teams will take responsibility to keep the existing service providers up to date with new insights and technology from applied agricultural research.

At national level an expertise centre within the Rwanda Agricultural board (RAB) of the ministry of agriculture will support the zonal AAS teams with expertise in adult education and agricultural extension methods.

The farmer field school methodology will become a corner-stone in development of training programs, as the methodology has a well worked out structure of design , training of trainers and implementation of training.

### ***Networks and alliances***

The ministry of Agriculture is the main driver behind the system.

However, the system builds on the principle of pluralistic advisory services, to be provided by service providers. These advisory service providers might be public employees, but will in majority be NGO based, working for producer organizations, be professional private service providers or be embedded in a private agri-business firm.

The district agricultural platforms that will play a role in demand articulation and allocation of resources for capacity building will consist of direct stakeholders in the agricultural sector in the district. The platform will be a sub-committee of the already established joint action forums (JAF) which are initiated in each district to coordinate initiatives in agriculture and advice the district administration. In the JAFs different organizations (public programs, NGOs and producer organizations) are represented.

The ultimate aim is that the district platforms will become established as the mechanism for demand articulation and resource allocation for agricultural advisory services.

### ***Policy environment***

The Government has formulated the Strategic Plan for the Transformation of Agriculture (SPAT II), in line with national strategies such as the EDPRS, the Vision 2020 and the National Investment Strategy. The PSTA II main objective is the transformation of subsistence based, smallholder agriculture into market-oriented farming. It is aligned around four strategic programs: (i) Physical resources and food production:

intensification and development of sustainable production systems; (ii) Producer organization and extension: support to the professionalization of producers; (iii) Entrepreneurship and market linkages: promotion of commodity chains and the development of agribusiness; and (iv) Institutional development: strengthening the public sector and regulatory framework for agriculture. Importantly, it also takes into account the Decentralization Policy of 2000, which seeks to involve local administrations more directly in the development process.

The government has also been promoting a policy to convert grass root farmer 'associations' into cooperatives, enabling them to enter into commercial activities, and for which an enhanced regulatory framework (the Cooperative Law) has been established.

A national agricultural extension strategy (NAES) was adopted in April 2009. The NAES is based on a number of guiding principles: (i) Participatory extension: stakeholders plan together for implementations, monitoring and evaluation; (b) Multi approach and multi method: various methods and approaches are recognized, provided that they are effective and complement each other; (iii) Demand driven and market oriented extension: In addition to market needs and/or requirements, interventions should be planned as per demand by different target groups (iv) Process and result oriented extension: The expected or targeted results and/or impacts should be planned well; (v) Multi actor extension: The strategy recognizes the complementarities and potential synergy of different actors in agricultural development (farmers' organizations, research, extension, agricultural education institutions, input supply, micro credit and other public and private partners intervening in the sector; (vi) Building on already existing initiatives.

The specific objectives of the NAES are to promote farmer organizations and to encourage their participation in agricultural sector stakeholders platforms, strengthen technical capacities of producers, improve proximity service delivery to producers in the perspective of gradual disengagement of the Public sector from direct extension service delivery and to promote a system of participatory extension and research adapted to the needs of producers, but also market requirements.

The Ministry of Agriculture (MINAGRI) has recently been in a process of institutional reform, and the six Agencies under MINAGRI are merged into two boards, namely Rwanda Agriculture Board (RAB) and Rwanda Agricultural Export Development Board (RAEDB). The RAB will harmonize research and extension services and disseminate appropriate and integrated information and technology transfer services to farmers organizations. The board functions will be delivered through 4 zonal centres. With the zonal centres of Research and Extension it is hoped that greater synergy will be achieved (linking research and extension), unlike what it has been in the current arrangement, as well as realization of economies of scale. The zones should support the decentralized government in the implementation of Agriculture and Livestock programmes at local level much better and faster than has been the case. The Rwanda Agricultural Export Development Board (RAEDB) deals exclusively with the promotion and marketing (at local, regional and international markets) of agricultural produce especially those identified for Rwanda's export market i.e. coffee, tea and horticulture among others.

### *Institutional conditions*

The ministry of agriculture will be an important driver of the process. It will take responsibility for development of training methods and materials, develop the method for demand articulation at district level and piloting and assessing effectiveness of capacity building methods.

The district administration will bear responsibility for the allocation and financial accounting of funds for capacity building by service providers at district level.

The district agricultural platforms will take the lead in demand articulation and selection of service providers to respond to this demand.

Agricultural advisory service providers will be contracted by the district administration, based on a selection by the district platforms. Any service provider can be contracted, disregarding whether it is a public, private, NGO or farmer organization.

The zonal AAS teams, comprising researchers and extension specialists, have the responsibility to continuously support service providers with refresher courses and new methods. Furthermore they are expected to use service providers to test and adapt innovative technology and training methods in the field.

### *Drives for change*

The actual needs assessment methodology will be further developed at national level by the ministry of agriculture with additional specialized technical assistance. The zonal AAS teams will support the district agricultural platforms in its routine execution. The outcomes will not only be used for the decision making on the allocation of resources for agricultural advisory services. It will also inform the district administration and assist in reviewing their district development plans.

To monitor the quality of support services provided an inventory of service providers will be made per district. Service providers will be registered on-line. A satisfaction rating system will be initiated through which clients of advisory service providers can provide feedback in a transparent and public manner. The satisfaction ratings will be published on-line.

Producer organizations are represented in the district agricultural platforms. Through this they have an influence on the demand articulation and the selection of providers of advisory services. This will also provide them with a platform to formulate concrete policy advice for the district administration.

Besides representing producers many producer organizations also provide services to both their members as well as to non-members. As service providers they can bid for contracts just as local NGOs or local private service providers.

A demand articulation from grass roots is not the only driver for change. Also applied or more fundamental research can be a driver for change. Through the zonal AAS teams the results from demand articulation and the new insights from research and extension are brought together. The AAS teams will have the role to interpret the demand and design a response. This response can be in connecting the demand directly to existing service providers overlooked at district level, by engaging with service providers to design a new product answering the demand, by initiating applied research, piloting new technology or methods, or by initiating a specific research effort.

### *Financial sustainability*

The main aim is to develop a critical mass of quality advisory service providers, who can be contracted by those requiring services, or by those investing in advisory services through development projects and programs. The structure developed to manage such funds can continue to run beyond the lifetime of the programme and provides the framework for effective investment in agricultural advisory services.

For its initiation the national advisory service programme will depend largely on bi-lateral funding from the Belgium directorate general for development cooperation (DGOS) for operational funds and be supported technically by BTC. The main source of human resources is the ministry of agriculture and specifically the RAB. The programme is built within the ministry of agriculture. All expertise that will be required in a routine manner will be built among employees of the ministry.

The total investments by the programme will be roughly 8 mln. Euro for a 4 year period. This does not include the regular human resources of the ministry of agriculture and district administration that will execute the programme.

The major investments by the programme are in the district funds for capacity building of agricultural producers and zonal funds for development of training programs and training of trainers. Substantial funds are also reserved for reinforcement of the ministry of agriculture staff at zonal level, to be absorbed by the ministry by the end of the project. Finally substantial funds are reserved for specialized technical assistance in the field of adult education, agricultural extension and linking research and extension during the whole project life. Several other topics on which expertise is lacking within the ministry of agriculture are identified for more precise technical assistance.

## Transforming extension into a decentralized demand-driven system in Tanzania

### *Background data*

Since 1990, poverty in Tanzania declined but it remains widespread, particularly in rural areas. About 17 million people – half the population – live below the poverty line of US\$0.65 per day. Approximately 80 per cent of the poor live in rural areas where about 70 per cent of the population lives. From 1991/92 to 2000/01 overall food poverty declined from 22 to 19 per cent while basic needs poverty declined from 39 to 36 per cent. Poverty declines were most rapid in major urban centres such as Dar Es Salaam (from 28 to 18 per cent) and least rapid in rural areas (from 41 to 39 per cent).

Agriculture accounts for 45% of the GDP and three-quarters of the merchandise export, agriculture is also the main source of employment to about 80% of the population. Food crop production has grown at about the rate of population growth and accounts for about 65 per cent of agricultural GDP (20% is maize), with cash crops (coffee, cashew, cotton, tobacco and tea) accounting for only about 10 per cent, but accounting for 85% of the export.

Over the 1990s, agricultural growth was 3.6 per cent, but it grew by 6.0% in 2004. Over the 1990s, agricultural exports grew at an annual rate of over 7 per cent per year, although this rate has slowed in recent years due to declining world market prices. The recent annual average growth rates of export crops, food crops, and livestock has been about 6, 4, and 3 per cent respectively. (ASDP, 2006).

### *Innovation in Tanzanian agriculture*

Tanzanian agriculture is dominated by smallholder farmers with typical farm sizes ranging from 0.9 to 3.0 ha. Much of the past growth in Tanzanian agriculture was the result of area expansion by smallholders, largely triggered by household food security concerns and prices for export commodities. The levels of agricultural inputs (fertilizer and pesticides) use are low, even in the export cash crops. The realization that research and extension services were not the drivers of innovation in Tanzania led to the development of the Client-Oriented Research and Development Management Approach (CORDEMA). CORDEMA is based on the IAR4D principles: (i) Developing a common agenda (of actors in the innovation systems); (ii) partnership and facilitation of learning; (iii) comprehensive assessments (from value chain to livelihood assessments) and (iv) monitoring, evaluation and uptake strategy development.

### *Networks and alliances*

Tanzania has been divided into seven (more or less agro-ecological zones, based on administrative boundaries) in each of these zones research and development coordinate zonal research for development. These Zonal Agricultural Research and Development Institutes (ZARDIs) adopted the CORDEMA. These centres are secretariats for a multi-stakeholder managed Zonal Agricultural Research and Development Fund (ZARDEF), which funds approved research proposals from public and private research providers on a competitive basis. This builds greater farmer influence and accountability into the choice of research programmes, with greater control over resource allocation by farmers. Zonal multi-stakeholder fora manage the research activities in general, while multi-stakeholder fora and farmer fora at district level oversee implementation of extension activities.

In the export crops the main stakeholders come together in produce boards and sector associations, initially on how to use the export levies raised, but increasingly in order to agree on measure for strengthening on the sector or value chain.

### *Policy environment*

Key features of Tanzania's agricultural sector policy are laid out in the Agricultural Sector Development Strategy (ASDS), covering three agricultural ministries and the President's Office for Local Government: (i) Sustained agricultural growth target of at least 5 per cent per annum, to be achieved through the

transformation from subsistence to commercial agriculture, as a core element of the Poverty Reduction Strategy; (ii) Transformation to be private sector-led through an improved enabling environment for enhancing the productivity and profitability of agriculture, with the removal of constraints to private sector involvement; (iii) Sector development to be facilitated through public/private partnerships, including increased contract farming (vertical integration), with a delineation of public/private roles; (iv) Focus on participatory planning and implementation, using the framework of the District Agricultural Development Plans (DADPs), which are part of the District Development Plans (DDPs); (v) Decentralization of service delivery responsibilities to Local Governments Authorities; (vi) Mainstreaming of cross-cutting and cross-sectoral issues in agricultural development operations. An Agricultural Sector Development Programme (ASDP) provides the overall framework and process for implementing the ASDS. Development activities at national level are to be based on the strategic plans of the line ministries while activities at district level are to be implemented by Local Government Authorities (LGAs), based on District Agricultural Development Plans (DADP). The DADPs are part of the broader District Development Plans (DDPs). The ASDP components are: (i) the policy, regulatory and institutional arrangements; (ii) agricultural services (research, advisory and technical services, and training); (iii) public investment; (iv) private sector development, market development, and agricultural finance; and (v) cross-cutting and cross-sectoral issues, including gender mainstreaming and implementation of the land acts. (ASDP, 2006)

### *Institutional conditions*

In order to improve the efficiency, relevance and effectiveness of the process of technology generation and dissemination (agricultural research and extension/advisory services) the old top-down research planning mode and the T&V system in extension were abandoned. At the same time continued public support for research and extension was made a priority, but a greater role for private sector service provision was also envisaged. This led to adoption of three main principles : (i) **Increasing control of resources by beneficiaries:** the ASDP stresses the importance of increasing the voice of farmers in district and ward planning processes and in increasing their control in the design and implementation of investments and over the kinds of services that they need, as well the corresponding resource allocation (ii) **Pluralism in service provision:** ASDP provides a wider choice in service providers to increase cost-effectiveness and competition. The private sector will be enabled to compete for sector service provision contracts with a de-linking of public funding from delivery; (iii) **Results-based resource transfers:** Resources allocations to LGAs will be more transparent and equitable through adopting and extending the local government grant system. The incentive for LGAs to use their funds effectively will be promoted through annual assessments.

### *Drivers for change*

As clearly illustrated by the export sectors, farmers strongly react to market opportunities (prices, timely payments, corresponding input supply etc.). The opening of internal markets also through improved road infrastructure has contributed to this, as well as the increase in trade opportunities EAC Customs Union and SADC arrangements). In all commodity sectors stronger interaction with market parties has been on the agenda for research and extension service providers.

### *Financial sustainability*

The expenditure on agricultural research as a proportion of agricultural GDP (a measure of research intensity) was at only 0.3 per cent, less than half the Africa region average. The ASDP provided higher levels of investment. Substantial progress was made within the area of fiscal decentralization and the disbursement of formula-based Agricultural Extension Block Grant to the district level. The block grants provide funding for both public and private agricultural service providers. Grants are also used for the contracting of private agricultural services (outsourcing) with greater control over resource allocation decisions by farmers.

Investments will be made in accordance with local needs, as determined through local participatory planning and budget processes. Agricultural inputs (seeds, fertilizers, agro-chemicals) will ordinarily not be

eligible for cost-sharing, unless they are part of participatory technology development activities. The emphasis in capacity development is on strengthening farmer empowerment (capacity to demand and allocate resources for, as well as procure services through farmer for a), public sector reorientation (LGA management capacity, service providers, and capacity strengthening of private service providers (service provision and technical and business advice).

This study on Strengthening Market Linked Innovation Systems was produced at the request of the Royal Netherlands Embassy in Ethiopia. It offers a perspective on how innovation processes and capacities could be further developed in support of Ethiopia's Economic Growth and Transformation Plan (EGTP) and the Agricultural Growth Programme (AGP). More specifically it provides recommendations to the Netherlands Embassy on strategic priorities in supporting development of agricultural sector in Ethiopia.

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