DANISH INSTITUTE FOR INTERNATIONAL STUDIES
STRANDGADE 56 • 1401 COPENHAGEN K • DENMARK
+ 45 32 69 87 87 • diis@diis.dk • www.diis.dk

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CONCEPTS AND EXPERIENCES WITH DEMAND DRIVEN ADVISORY SERVICES

REVIEW OF RECENT LITERATURE WITH EXAMPLES FROM TANZANIA

Esbern Friis-Hansen

Danish Institute for International Studies, DIIS
Strandgade 56, DK - 1401 Copenhagen, Denmark
Ph: +45 32 69 87 87
Fax: +45 32 69 87 00
E-mails: diis@diis.dk
Web: www.diis.dk
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Esbern Friis-Hansen, Senior Researcher, Danish Institute for International Studies

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Abstracts

The current institutional framework for agricultural services in East and Southern Africa was designed for a state-sponsored supply-driven approach. These institutions demand large field staff levels and are associated with high costs often financed by World Bank loans. These institutions are moreover ill-suited to respond to the demands from clients that are now emerging through development interventions and policies. Farmers are marginally involved with planning the content and means of service provision. Top-down approaches also fail to target agricultural services to women and vulnerable groups. Demand-driven advisory services have evolved over recent years and involve changing the role of extension agents from advisors to facilitators; increasing control by farmers through cost sharing; increasing the use of contracted services; and emphasizing knowledge provision rather then narrow technical advice.

The DIIS Working Paper discusses four conceptual aspects of this changing approach to extension. First the working paper discusses the shift in international thinking about extension. This includes an analysis of the key principles of the conventional Training and Visit Extension methodology and the new emerging Client-driven Advisory Services model. Secondly, the management implications of the shift in paradigm are discussed, emphasizing the change in relationship between farmers and external actors. Thirdly, the working paper is concerned with the approach to farmer learning. The fourth aspect discussed is the technology development processes associated with the extension models. The working paper finally reviews a range of experiences in Tanzania with new forms of extension.

Mange offentlige institutioner inden for landbrugssektoren i Afrika blev grundlagt medens landbrugspolitikken stadig var domineret af en udbudsdrevet moderniseringstilgang, finansieret af store lån fra Verdensbanken og med mange ansatte og store omkostninger. Bønderne havde kun ringe indflydelse på indholdet og tilgangen til udvikling af landbrugsteknologi og rådgivning. Landbrugskonsulenttjenesten er i mange afrikanske lande snævert fokuseret på produktion og har ikke magtet at gøre deres rådgivning relevant for kvinder eller fattige og udsatte grupper. Reformer af den offentlige sektor i forbindelse med 1990ernes strukturtilpasningsprogrammer og reducerede statsbudgetter har generelt svækket disse landbrugsinstitutioner. En efterspørgselsdrevet tilgang til landbrugskonsulenttjeneste er blevet udviklet gennem de seneste år og er blevet debatteret mellem internationale donorer og

nationale aktører. Denne tilgang involverer en ændret rolle for landbrugskonsulenten fra rådgiver til facilitator, at bønderne får øget kontrol over indhold og form, og mere vægt på at stimulere bredere viden blandt bønderne frem for snæver teknisk rådgivning.

På basis af en litteraturgennemgang diskuterer DIIS arbejdspapiret fire aspekter af den ændrede tilgang til konsulenttjenesten. Først analyseres de vigtigste begreber i T&V-tilgangen og den nye efterspørgsels-drevne tilgang til landbrugskonsulenttjenesten. Derefter diskuteres ledelsesmæssige implikationer af skiftet i tilgang, med vægt på magtforholdet mellem bønder og eksterne aktører. Det tredje aspekt vedrører pædagogisk metode og tilgang til indlæring, der i stigende omfang anvender ikke-formelle voksenundervisningsprincipper. Det fjerde aspekt der diskuteres, er den stigende inddragelse af bønder i udvikling og tilpasning af landbrugsteknologi. Sidst i arbejdspapiret findes en gennemgang af hidtidige erfaringer fra Tanzania med øget bonde-styring og efterspørgsels-drevet landbrugskonsulenttjeneste.

Preface

The paper was used as input and inspiration for two working groups under ASDP Task Force 3 (Working Group on Extension; and Working Group on Farmer Empowerment and Organisation). Draft versions of the paper were discussed with members of these working groups and their contributions have improved its quality. The author is in particular grateful for contributions from Professor Rutatora (Sokoine Agricultural University) and Yakobo E. K. Tibamanya (National Coordinator PELUM). The experiences with client-driven approaches in selected interventions (section 4) are largely based on input from the involved organizations.

The author is grateful for comments from colleagues in four FAO-World Bank-IFAD Backstopping and Formulation Missions undertaken during 2003/2004. In particular thank to Guy Evers from FAO Investment Centre for constructive comments.

Acronyms

AESA	Agro-ecological system analysis
ART	Action-Research-Training
ART	Action-Research-Training
ASDP	Agricultural Sector Development Programme
ASP	Agricultural Service Providers
ASP	Agricultural Service Providers
CBAHW	Community Based Animal Health Workers
CBASP	Community Based Agricultural Service Providers
CBO	Community Based Organisations
DALDO	District Agriculture and Livestock Development Officer
DFO	Dairy Farmer organization
FARMESA	Farm-level Applied Research Methods in Eastern and Southern Africa
FFS	Farmer Field Schools
FG	Farmer groups
FSR	Farming Systems Research
HIMA	Hifadhi ya Mazingira
IFAD	International Fund for Agricultural Development
IFPRI	International Food Policy Research Institute
IPM	Integrated Pest Management
IPM/IPN groups	Integrated Pest Management/Integrated Nutrient Management
IPNM	Integrated Plant Nutrient Management
KAEMP	Kargera Agricultural and Environmental Management Project
MAC	Ministry of Agriculture and Co-operatives
MAFS	Ministry of Agriculture and Food Security
Mara-FIP	Mara Farmers' Initiative Project
MCM	Ministry of Cooperative and Marketing
MWLD	Ministry of Water and Livestock Development
NAADS	National Agricultural Advisory and Development Services
NAEP II	National Agricultural Extension Project phase II
NALERP	National Agricultural and Livestock Extension Rehabilitation Project
NGO	Non Governmental Organisation
PASP	Private Sector Agricultural Service Providers
PELUM	Participatory Ecological Land use Management
PIM	Participatory Impact Monitoring
PME	Self-monitoring and evaluation

PPB	Participatory Plant Breeding
PPB	Participatory Plant Breeding
PRA	Participatory Rural Appraisal
PTD	Participatory Technology Development
RIPS	Ruvuma Integrated Programme Support
SAF	Self Assessment Facilitation
SHDDP	The Southern Highlands Dairy Development Project
SMS	Subject Matter Specialist
T&V	Training and Visit extension system
TF-3	Task Force 3
VEO	Village Extension Officer

1. Introduction

Past methods to improve service provision, such as the Training and Visit (T&V), have not stimulated sufficient agricultural production to meet poverty reduction needs. Services have generally focused on increasing production through short-term technical packages, without paying attention to farmers' circumstances, markets and long-term sustainability. Despite various attempts, the linkages between research, extension and training and between public and private partners have not been effective.

The current institutional framework in many African countries was designed for World Bank loan financed and state sponsored supply-driven approaches, with large field staffing levels with accompanying high support costs, and not well-suited to respond to a client-oriented approach, now emerging through various interventions. Farmers / clients are only marginally involved in the planning and provision of the services which are intended to support them. Currently agricultural services also fail to address the important needs of women and vulnerable groups, who form the majority of the farmer population. In addition, frequent institutional changes associated with structural adjustments, as well as inadequate funding and staff incentives have further reduced the capacity to adjust to new approaches.

International evidence is strong that a reform of public agricultural service provision built around demand-based approaches, and which typically requires significant institutional change, can lead to significant productivity and poverty reduction returns[1]. These reforms stress, amongst other things, changing the role of extension agents from advisor to facilitator; increasing control of farmers though, for example, cost sharing; increasing use of contracted services; and stressing knowledge provision and not only technical advice. Recent experiences in Tanzania are that such approaches could have significant results, but require major institutional reform to be scaled up through a national investment programme.

Government policy is to divest from activities which can be better implemented by the private sector and to increasingly transfer public-good operations to commercial and service agencies (including where feasible research and extension), leaving to the line ministries the planning, regulatory and policy functions. Therefore, organisational and management reform of public research and extension services is urgently needed to assign new roles and responsibilities that

[1] Refer to Common Framework on Agricultural Extension, Neuchatel Group, 1999.

reflect current policies, as well as to facilitate farmer empowerment and the efficient provision of public and private demand-driven services.

This DIIS Working Paper was written as an input to a policy formulation process under the Agricultural Sector Development Programme (ASDP) in Tanzania, with the aim of developing a new national policy for agricultural research, extension, training and technical services and to formulate a Agricultural Services Support Programme (ASSP) that implement parts of this policy.

The Working Paper is organized in four sections. Section 2 discuss four aspects of the changing extension concepts and is based on a review of recent literature. First the shift in international thinking about extension is illustrated by an analysis of the key concepts of the convention T&V extension model and the emerging model of Client-driven Advisory Services. Secondly, the management implications of the shift in paradigm are discussed, emphasizing the changing relationships between farmers and external actors. The third aspect is concerned with the implications of the paradigm shift for approaches to extension and farmer learning. The forth aspect discuss the technology development processes associated with the shift in extension model.

Sections 3 and 4 are review recent experiences in Tanzania. Section 3 contains an analysis of the current publicly funded extension system and briefly discusses the rationale for extension reform. This section is largely based on internal and external review reports of World Bank loan financed extension projects. Section 4 comprises eight short discussions of experiences with client-driven approaches in selected project interventions.

Section 5 comprises a selected bibliography over recent general agricultural extension and farmer empowerment literature as well as Tanzania specific studies and policy documents.

2. Recent Changes in Extension Concepts

2.1 EXTENSION MODELS: FROM T&V TO CLIENT-DRIVEN EXTENSION

Training and Visit (T&V) Extension System

The best known extension effort that focuses on 'pushing' predefined technology from research to farmers is the Training and Visit (T&V) system (Hulme, 1991). The T&V extension system was developed with the support of the World Bank in the 1970s. It is based on a detailed extension service work schedule for farm visits, training of extension workers by subject matter specialists and reporting. On a regular basis, extension workers meet with contact farmers, who should be 'representative' of their communities. These contact farmers are presumed to transfer technical messages on to other farmers in the community. These technical messages are developed by research and deliberately kept simple and limited in number. The content of the messages is based on natural science aiming at increasing resource efficiency and agricultural productivity (Howell, 1987).

An ever growing volume of literature on T&V has found this extension approach to be ineffective (i) in rain-fed areas, (ii) in reaching the poor, (iii) in farming systems with a subsistence element, (iv) where research institutions are weak, (v) where training and supervision of extension agents is limited, (vi) where logistical difficulties are great and (vii) where access to funding is unstable (Baxter and Pickering 1988, Howell 1987, Feder *et al* 1985, Humle 1991, Cernea *et al* 1985, WB 1994, and Christoplos and Nitsch 1996). T&V is moreover found to be expensive with regard to recurrent costs (Moris 1991).

Many analysts have challenged the implicit assumption in the T&V extension system that messages have to be simple. Farming systems studies and social science development research have shows that technologies used by poor farmers are, if anything, more complex than those used by wealthier farmers (Chambers, et al 1989, Friis-Hansen 1995, Boesen and Friis-Hansen 1999). It may, however, be correct that the complex technologies which extension wishes to promote are only appropriate for the wealthier farmers as they involve complex use of external inputs, whereas poor farmers employ complex combinations of local social and natural resources (Christoplos and Nisch 1996).

Agricultural extension has increasingly been politicised and the T&V system has come to signify an agricultural development discourse that emphasises increasing aggregate production for export and *national* food security through transfer of technology. The critics of T&V

emphasise goals of local and *household* food security and empowerment of women and poor farmers using marginal lands.

A WB evaluation report as far back as 1996 on achievements and problems in national agricultural extension and research systems (World Bank 1996), concludes that its extension portfolio (of which 90% is based on the T&V model): is expensive and has inadequate funds to operate its services properly; has insufficient relevant technologies to promote which was frequently a problem and a major constraint in resource-poor environments; that neither research nor extension was sufficiently conscious of the need to understand the constraints and potentials of the different farming systems as a basis for determining relevant technology and technology development requirements; and that project design and implementation paid little attention to the farming community's systematic participation in problem definition, problem solving, and extension programming. The report moreover concludes that a top down culture is widespread in the public sector institutions in most developing countries and that this persisted in most WB projects and was contrary to the development of responsive services (World Bank 1996).

A range of extension projects using a modified T&V model (with slightly less rigid schedules and command structures) were financed through World Bank Loans to African Governments up to the mid 1990s and dominate the present day extension systems. These projects often combined the top-down T&V system with attempts to use of participatory methods for mobilizing farmers.

Client-Driven Extension

A new radical different model for extension has emerging in recent years (Neuchatel Group 1999 and 2000, WB/AKIS 2000, Government of Uganda 2000, Hagmann *et al* 1999, WB 2003). One of the key players in placing this issue on the international development agenda is the Neuchatel Group[2], which is an informal group of bilateral and multilateral cooperation agencies and institutions involved in sub-Saharan African countries who, since 1995, has held a series of meetings and initiated case-studies to contribute to thinking on the objectives, methods and means of support for agricultural extension policies. The main elements of these new extension service systems, as expressed by the Neuchatel group includes (Neuchatel 2001):

[2] The Neuchantel group is comprised of representatives from GTZ, USAID, DfiD, Danida, CF, Sida, CDC DDC, NeDA, FAO, IFAD, ECIDG Viii, CTA and WB.

- Deepening decentralisation. Following dissatisfaction with the centralised and standardised T&V extension system, decentralisation and pluralism have been identified as preconditions for making extension accountable to smallholders at the field level.
- Changing the role of the extension worker from advisor/teacher to facilitator. Extension agencies are no longer only providers of technologies and advice but create conditions for a broader flow of information and knowledge. 'Extension workers' are being transformed into 'farm advisors' who engage their client farmers in critical thinking about their agricultural endeavours and about the management of their farming enterprises.
- Changing the relationship between smallholders and extension providers, by increasing farmers influence and control over the extension service. Cost sharing through introduction of fee-based structures is seen to support a demand-driven relationship and increase sustainability, but has raised equity concerns.
- Assisting smallholders to link with market opportunities. Extension agents were in the past discouraged from analysing changing priorities and local specific opportunities themselves. The new approaches see an enhanced role of farm advisors in identifying market opportunities for smallholders based on an understanding of local cultivation practices and diversity of products.
- Contracting out of services. Public finance does not necessarily mean public delivery of advisory services. A variety of new ideas are emerging for innovative forms of collaboration between public finance and private actors.

At a recent workshop titled 'Extension and Rural Development – Converging Views for Institutional Approaches*' (*organized *jointly* by the World Bank and Neuchantel Initiative) It was discussed and agreed that (ARD 2002):

- Extension is a knowledge and information support function for rural people that have a broader role than just providing agricultural advice.
- A mature extension system is characterized by a pluralistic system of extension funders and service providers. However, the public sector must continue to be a major player, both in funding and coordinating operations.
- Extension policies and strategies need to define effective division of labor between public extension and other providers, and identify overall objectives for public sector involvement in extension.
- Extension services should be part of the decentralization and devolution agenda, engaging full involvement of local government units and grass-root organizations.

- Agricultural extension, either public or private, cannot properly function without a continuous flow of appropriate innovations from a variety of sources, local and foreign.
- All providers need a system to assess extension outcomes and feed this information back to policy and coordination units.

These elements of a new approach to extension represent the joint understanding of the donor group of necessary changes to the existing extension structures. However, while all of these elements have been tried out on a limited scale as components of donor supported development projects or through activities of NGOs, a range of questions remains to be addressed and the NAADS programme in Uganda (Government of Uganda 2000) is the first attempt to implement such a model on a national scale. There are profound challenges to realising this new approach to extension and technology generation.

The literature recognises four major challenges to realising the new approach to agricultural extension (Friis-Hansen 2001, IFAD 2002):

- A low level of development of civil society organisations through which smallholders can articulate their requirements in a more focused and forceful way to both the public and private sector. One set of organisational issues relates to farmers' organisational capacity to collectively manage the use of private and common natural resources within a given community. Another set of organisational issues relates to the development of legitimate farmer organisations, which can influence national policies on behalf of their members.
- A low level of preparedness of smallholders for evaluating the recommendations they will receive from different sources. To enable effective processes of technology generation and access to technology, smallholders are required to seek after diverse sources of information, evaluate what they receive, and as users of technologies this demand greater knowledge about their ecosystem.
- Resistance within the public sector to the necessary change in institutional culture, including basic attitudes towards farmers and re-assessing work approaches.
- Public finance contracting to private agricultural service providers.

As governments seek to adjust their role in technology transfer to one of facilitation and appropriate regulation, the evidence suggests that a leaner, better-informed and more highly skilled cadre in the residual public sector advisory services is likely to be better received by client farmers and may achieve more cost-effective impact.

Outside government, there is a pressing need to develop a pluralistic approach to service provision and local level interaction with farmers that creates an enabling environment for the private sector and civil society organizations to expand their roles. For poorer farmers, access to technology can be improved through specifically targeted investments and well-directed subsidies. Some continued public expenditure can be justified in the delivery of public goods and to rectify market failures, especially in more difficult areas. This is reinforced by the need to reverse trends of overt or hidden taxation in recent decades and to enhance the positive opportunities (and diminish the threats) of globalization, especially given the continuing subsidy of agriculture in many OECD countries (Farrington, J et al. 2001).

A crucial assumption underlying agricultural adjustment reforms, that private traders and service providers would emerge to take over many of the support functions previously undertaken by the state (Friis-Hansen 2000, IFPRI 2000). However, in many countries, the demand has not provoked the anticipated surge of market-led enterprise and the contraction in public services has left a vacuum in both downstream and upstream linkages for farmers. Proactive policies continue to be required to stimulate demand for services from non-government sources and to facilitate the expanded involvement of the private sector and civil society.

Throughout the region, devaluations and the elimination of subsidies have resulted in generally higher real farm-gate prices for inputs. Institutional attrition has decreased access to input credit and, in remote areas, to any inputs at all. The private sector may have begun to market inputs more efficiently at import and wholesale levels, but – particularly in the more remote or marginal areas – has been unable or unwilling to assume the role of secondary distribution and associated credit provision. Worse, some new entrants have themselves become extractive at the expense of the rural poor (Friis-Hansen 2000).

2.2 MANAGEMENT: FROM HIERARCHICAL DECISION-MAKING TO FARMER EMPOWERMENT

Hierarchical Management Structures

Until recently African Governments ran a monolithic extension service operated under hierarchical structures within ministries of agriculture, employing thousand of staff (in the form of subject specialists and field level agents), extended to a very local level and with the political attraction of uniform availability. Such large-scale systems proved to be fiscally unsustainable in the long run and are now being scaled down, substantially restructured or gradually discontinued. Decentralization of administrative and institutional responsibilities has

further weakened the funding base of extension services, leaving staff without the means to sustain regular or meaningful contact with the farming community (IFAD 2002). In practice decentralization often amounts to 'de-concentration' with little or no effect on improving the responsiveness to local demands and hence making extension even less relevant to the farming communities it is supposed to serve (Friis-Hansen 2000).

Farmer Empowerment

Development resources reaching farmers are scarce and their effective use is essential if they are to success in alleviating rural poverty through increasing agricultural productivity and income among poor farmers. Recent studies argue that empowerment of farmers may increase effectiveness of how public funds are used for financing agricultural services. Empowerment is thought to (i) have a positive impact on good governance and growth; (ii) influence growth to be inclusive of the poor; and (iii) improve the outcomes of development projects (World Bank 2002).

The concept of empowerment has different meetings in different socio-cultural and political contexts. Empowerment has both intrinsic and instrumental value and the concept is relevant to characterize relations within households, between different social groups of people, as well as the relationship between local communities and the outside world. Hence there are many different definition of empowerment. Most focus on issues of gaining power and control over decisions and resources that determines one's life, while taking into account structural inequalities that affects different social groups (World Bank 2002).

The following definition of Farmer Empowerment is sought to be useful and operational in the context agricultural extension (Note on Empowerment to TF3 by WB/IFAD/FAO backstopping team, 2003):

> *Farmer empowerment is when farmers assume the authority, resources and capabilities to hold accountable and influence the content of public and private agricultural services, such as extension, research, training, information, investment and marketing.*

Although there is no single institutional model for empowerment, experience shows that certain elements are commonly present in successful external interventions in local communities aimed at empowering the farmers (see box below).

Box 1

1. Access to information is power. Two-way information flows between communities and government institutions improve farmers' ability to make informed demands, exercise their rights and access services. Access to information further improves transparency and minimizes corruption.
2. Participation of farmers in decision-making and inclusion of all social groups ensures that decisions over use of limited available resources build on local knowledge and priorities and brings about commitment to change.
3. Accountability. Government servants can be held to account, making them answerable to farmers' for their policies and actions that affect their well-being.
4. Organizational capacity refers to the ability of farmers to organize themselves and mobilize resources to solve problems of common interest. Organized groups of farmer are more likely to have their voices heard and demands met

Source: World Bank 2002

Four aspects of farmer empowerment are found to be influence the effectiveness and relevance of agricultural services and development, namely (i) knowledge empowerment, (ii) organizational empowerment, (iii) institutional empowerment and (iv) financial empowerment. These aspects of empowerment are defined in the following (Note on Empowerment to TF3 by WB/IFAD/FAO backstopping team, 2003):

- Farmers' knowledge empowerment is when farmers are able to understand causes and effects of his or her own agricultural problems and are able to articulate their technology, extension and development needs as informed demands. Knowledge empowerment is the basis that allows farmers to actively participate in the planning, implementation and evaluation process of services available to them, in effect transforming them into clients, managers, and/or owners/partners rather than passive beneficiaries.
- Farmers' organisational empowerment is when farmers are organised in groups that are coherent, independent and sustainable. Such groups are the institutional foundation that can enable farmers to express their informed demands for agricultural extension and research services to outside agents of change and to interact in partnership with public institutions.

- Farmers' institutional empowerment is when individual farmers and farmer groups are organized in associations and organization, with legitimate representatives, which assert direct influence over agricultural research and extension services and development activities.
- Farmers' financial empowerment is when farmers through their representation at ward and district level influence the use of public agricultural

Institutional factors strongly influence the uptake and further development of agricultural technologies by poor farmers. The availability of technological innovations can instigate changes in natural resource management organizations, and those same institutions can influence the process of technology generation and adoption. Smallholders can organize themselves to improve their access to technology through representative organizations (farmers' unions), legally registered bodies (such as cooperatives, savings and credit unions or water users' associations) or special interest groups (formed to receive extension advice or facilitate the processing/marketing of farm produce) (Guebbels and Gnon 1994, Rondo and Collion 2001).

In the past, imposed forms of association have often been mismanaged, politicized and subject to corruption. Greater success in terms of group coherence and sustainability has been achieved where association has been driven from within. Participatory approaches are generally weak at recognizing and mitigating situations of conflict. When external interventions aim to empower poor smallholders to control their own development process, they influence the relative positions of power within the community and enacting some solutions may block others (Cousins 1996). There is also potential conflict between the goals of external donors and the motivations and aspirations of members of farmers' organizations.

Farmer organisations are today seen by many donor organisations as an instrument to increase the effectiveness of technology generation and diffusion among smallholders, by providing relevant extension service to members and links to public and private agricultural service providers (Danida 2000). Others view farmer organisations as potentially playing a role in changing the overall relationship in agricultural development by empowering farmers to influence and exert their will over government policies and state bureaucracies (Scoones and Thompson 1993).

External support of farmer organisations is a common element in many extension approaches, such as T&V. The assumption behind such support is that farmer organisations' are a cost effective way to reach a large number of farmers. The evidence to support this is mixed. A

survey of farmer organisations' shows that the initial cost of organising farmers is high, but that these costs are justified in cases where farmer organisations have been successful in providing agricultural advisory services to its members (Ferrington and Bebbigton 1993). Other donors and NGOs support farmer organisations to further social and gender equity goals through collective action for empowerment. While such external support in some cases has been successful, there is a potential conflict between the goals of external donors and the motivations and aspirations of members of the farmer organisation. The poorest farmers and women are seldom members of farmer organisations, as they are not able to invest time and resources in attending meetings (Ferrington and Bebbigton 1993).

Farmer organisations to a greater or lesser extent represent legitimate interests of their members. Internal democratic structures and the existence of checks and balances by members over the leadership are essential for farmer organisations to grow strong and influential on behalf of members. It seems to be the norm rather than the exception that the leadership of farmer organisations is taken over and diverted to non-legitimate goals by national or local politicians when the organisations become important political players (Rondo and Collion 2001).

The ability of a farmer organisation to lobby for smallholders' interests and influence national policy is as strong or weak as its members' ability to express their needs. The limited capacity to and experience in assessing farmers' needs is a major weakness in many farmer organisations. The poorest farmers and women are seldom members of farmers' organizations, as they are not able to invest time and resources in attending meetings (Ferrington and Bebbigton 1993). However, opportunities for improving upon group-based methods of interaction are expanding as democratic change deepens, rural communities are empowered to act on their own behalf and the poor gain a greater voice for articulating their needs (IFAD 2002).

Box 2 Examples of research and extension systems with elements of farmers influence

In Ethiopia, Research-Extension Advisory Councils at zonal/research centre, regional and federal levels have been set up with farmer, NGO, private sector and government depiction. The Research-Extension Advisory Councils provide opportunities during regular meetings for stakeholders to reflect on farming concerns with a view to increasing the responsiveness of research programme design and content to the problems, opportunities and priority needs of (especially) smallholder farmers. The Ethiopian Agricultural Research Organization is represented at each level and so its internal systems of technical review of research programmes are thereby informed by the output of the Research-Extension Advisory Councils.

In the communal areas of Namibia, Regional Management Units increasingly determine agricultural field programmes at an operational level. The Regional Management Units coordinate all agricultural development in the region at an operational level and so form the main points of interaction between research and extension staff and other key stakeholders. The Regional Management Units explicitly recognise inter-relationships between elements of farming systems allowing a broad-based perspective on agricultural issues in the region to influence the design of programmes of interaction with farmers and inform institutional decision-making. Field activities are based on participatory learning and action methodologies.

Maintenance of and change in institutional cultures within public and private agricultural research and extension is a central element to the challenge of facilitating technology generation and wider uptake (Friis-Hansen and Boesen 2001). The criteria on which decisions about research and extension are taken are not only influenced by farmers' requirements. Other elements include the actors' skills, educational background and belief in the development relevance of established agricultural research and extension approaches, vested economic and political interests, and the nature and legitimacy of the interface between state institutions and community interests (Hagmann *et al* 1999).

Extension workers and officers in parts of Zimbabwe have made remarkable changes in the attitudes and work approaches after undergoing 18 month 'training for transformation' courses based on Paolo Freire's pedagogy of liberation, (Hope and Timmel 1984). The training provides the agricultural service providers with a range of methodologies and tools, which enable them to act as facilitators. The change in role calls for the agricultural services provider to become involved in a two-way interactive communication process and interact with different social groups within a given community.

2.3 EXTENSION APPROACHES: FROM ONE-WAY COMMUNICATION OF TECHNICAL MESSAGES TO CONTEXTUAL AND EXPERIENTIAL LEARNING

There are many actors involved in agricultural extension and what keeps the system together is the interaction between these actors through communication. The communication processes in agricultural extension are complex and include a range of social conditions and relationships. Communication models provide a theoretical framework for understanding these complex issues and have been the basis for extension models. Three communication models are discussed in the following, namely, the diffusion model, the relevance model and the platform model.

The Diffusion Model

The diffusion model applied to agriculture is an attempt to apply a scientific model to an extension system. This model provided the theoretical basis for the T&V extension model. The diffusion model describes communication as a linear process with six elements:

- a sender (the extension worker);
- a message (formulated by an agricultural research station);
- a communication channel (an individual or group meeting, possibly relating to a demonstration plot);
- an audience to receive the message (selected farmers);
- an effect on the audience (adoption of technology or change in attitude); and feedback (monitoring to refine the process).

The diffusion model consists of three components: adopter categories, an adoption process and characteristics of innovations (Rogers and Shoemaker 1971). Farmers are divided into five *adoption categories*: innovators; early adopters; early majority; late majority; and laggards. The diffusion model attributes certain characteristics to each of these adoption categories. Extension approaches that over time have been implicitly based on the diffusion model have given the most responsive farmers, e.g. innovators and early adopters, titles such as model farmers or progressive farmers. The diffusion model divides the *process of adopting* a new technology of farm management practice into five stages: Awareness; interest; evaluation; trial and adoption. Adoption is seen as a lineal process undertaken by rationally behaving farmers. As an explanation of the fact that some innovations and practices are adopted faster than others, the diffusion model attributes a set of characteristics to different types of innovations.

The five characteristics of innovations are as follows: relative advantage; compatibility; complexity; trialability; and observability (Christoplos and Nitsch 1996).

The diffusion model has been criticised for being based on assumptions that do not hold under conditions facing rain-fed small-scale farmers in developing countries. The model assumes that research institutions are able to provide appropriate blanket recommendations that are valid for farmers living in broadly defined agro-ecological zones. The proposition that an appropriate technological package can be designed for an average farm has proven unrealistic, given the complexity of smallholder agriculture and the great variations in production conditions even within a given community. Smallholders are moreover assumed to be able to mitigate unexpected environment or socio-economic conditions. However, the model fails to draw attention to smallholders' actual production conditions and smallholders living in complex uncertain production environments have therefore often found themselves unable to follow the management requirements of new technologies and thereby unable to benefit from them (Humle 1991).

The diffusion model's feed back mechanism has moreover been criticised for being systematically fraught. By viewing adoption as the rational behaviour, researchers and extension workers were provided with an excuse for responding to criticism from smallholders. The explanations for non-adoption have, according to the logic of the model, to be found in deficiencies of farmers' rationality. Late-adopting farmers or laggards are therefore characterised as traditional and conservative, while innovative farmers are modern (Christoplos and Nitsch 1996).

The implementation of the diffusion model through T&V based extension systems culminated in the establishment of a paternalistic institutional approach to service delivery and in a concentration of effort on the supply side of technology development and delivery. At best, education and extension services based on the diffusion model provided relevant information, but seldom increased the analytical capacity of farmers.

The Relevance Model

The relevance model seeks to overcome the apparent deficiencies of the diffusion model, by focusing on farmers' perceived needs. This model has been the theoretical inspiration of for farming systems research and associated attempts to introduce participatory extension approaches in existing extension programs.

The relevance model operates with a one-sided sender (the research station and extension service) and a target group (farmers). The model seeks to ensure that the technical message is appropriate by defining farmers' perceived needs through a participatory appraisal. The relevance model focuses on technical innovations and assumes that farmers' discrete needs can be defined and described through a participatory appraisal and addressed by specific technical measures (Christoplos and Nitsch 1996).

Critics of the relevance model argue that it is very difficult to control and quantify the production factors for smallholders in cause-effect terms. The type of knowledge used by a farmer to manage his/her farm is contextual and cannot be separated from the person who practices it. Extension messages and associated technologies developed within the framework of the relevance model using a combination of science-based knowledge and participatory appraisal are likely to be of limited use to many farmers.

In particular this is true in areas where solutions to problems of smallholders to an increasing extent have to be based on improved management of local resources, as access to and viability of conventional external inputs have declined. The complexity of local agro-ecology is accompanied by an equally high degree of socio-economic diversity. The development of solutions under such circumstances requires a new and more farmer-oriented approach to problem solving and decision-taking procedures, systematically involving farmers in the entire process of searching and applying new solutions, which may comprise both social and technical elements (Friis-Hansen 2001).

The Platform Model

Poor smallholders farm management is more concerned with flexibility and adaptation than with control, as their context of farming is complex and unpredictable from both an environmental and socio-economic point of view. Any decision to make changes in there farming practices can be disastrous for the farmer if not properly assessed beforehand.

The platform model acknowledges that farmers themselves posses great knowledge and experience about management of their resources. The farm practices reflect that experience and the farmers' aspirations and perceptions of constraints, opportunities and risks. However, the model also acknowledges that farmers' experiences in many respects are incomplete and inadequate and farmers are subject to misinterpretations and misjudgements of their situation (Christoplos and Nitsch 1996). The platform model acknowledges that solutions to smallholders agricultural problems require continuous dialogue between external agents and farmers in order for farmers to learn how to better maintain, understand and manage local resources. The platform approach suggests that extension services should have a central role

in ensuring that specific target groups (e.g. poor farmers or women) are represented as stakeholders and initiate and facilitate new platforms for negotiations where existing institutions do not exist or are inadequate. (Roling 1994).

Box 3 Farmer Field School Approach to Farmer Learning

The Farmer Field School (FFS) approach has been receiving much attention for its potential to create and institutionalise local community groups comprising well-informed, confident and skilled learners. A key feature that distinguishes the FFS as a learning system from primary education and current extension service approaches is its insistence on understanding causes and effects rather than correct answers. A recent study of institutional issues of FFS in Ghana and Mali found that the most significant thing learned by farmers during the FFS was 'the bugs' (i.e. understanding of insect predator-prey interactions and dynamics of insect populations) and that this system based learning opened the farmers eyes to a truly novel window on to a entirely new view of the live within the fields. The second most frequent cited aspect was that of the plant life cycle approach used in FFS. In case of FFS on rice, this approach allowed farmers to examine such things as the ability of plants to compensate for vegetative loss, as well as to understand why the timing of input application and water management needs to coincide with specific stages of plant growth (i.e. physiological life cycle of plants). Apart from the substantive issues of what farmers learned, the radical different way in which farmers learned (i.e. the use of experiential learning techniques) was cited as an important feature of FFS (Draft MTR of the Global IPM Facility, FAO 2001. Annex B10).

The achievement of FFS in terms of improving farmers' ability to participate in a genuine technology dialogue is highly encouraging. The study discussed above also found farmers' idea of their own role in knowledge generation (i.e. how they could approach solving new problems) was now well established among the FFS graduates. However, farmers in one location stated that while they now had a much better understanding of 'how' their systems functioned, and 'why' it was important to do certain things at specific stages of crop growth, they were often uncertain about exactly 'what' they should do.

The platform model has in recent years inspired support for a contextual learning approach to extension. Following limited basic training, groups of farmers are facilitated and assisted by external agents to carry out experiments with indigenous and externally introduced technologies in on-farm trials (Röling and van der Fliert 1994, Habermas 1984 & 1987). This is the basis for Farmers Field School teaching and learning approaches, which stimulate

contextual, experimental and social learning relating to integrated pest management (van der Fliert 1993, Schmidt et al 1997).

Bawden (1992) distinguishes between three facets of the learning process, and argues that only learning that and learning how are included in the curriculum of conventional extension workers. The third facet, praxis, is concerned with experimental and contextual aspects of learning. This facet addresses the experiences through which the student develops his/her understanding of processes. Establishment of a basis for dialogue, through which ideas are shared and developed through mutual understanding, requires new approaches to learning as a continuous process. Contextual experimental learning approaches place high emphasis on how smallholders learn and relatively less emphasis on what they learn.

The acknowledgement that smallholders are best placed to make effective decisions about farm management practices in their local specific complex environmental and socio-economic context is a strong argument for knowledge empowerment of smallholders. Poor smallholders often strive to maximize the use of diversity, in terms of microclimates within and between fields as well as intra-species diversity of plant genetic resources. Smallholder's agricultural production is not only influenced by its physical and chemical properties, but by a multitude of social and cultural factors. While conventional agricultural research and extension reduces the complexity of smallholders farming, participatory approaches aim to understand these complexities and take them into account. Acceptance of a contextual learning approach is seen as essential to confront the constraints, which exist among smallholders (Röling and Wagemakers 1998).

Based on experience with an integrated rural development Project in Zimbabwe involved with implementing learning through experience in the extension system, Hagmann et al 1999 concludes that, knowledge and understanding gained through the experimentation process strengthens farmers' confidence in their capacity and knowledge. This increases their ability to choose the best options and to develop and adapt solutions appropriate to their specific ecological, economic and socio-economic circumstances.

The above mentioned Zimbabwe experience shows that successful technology generation can be achieved through strengthening the capacity of smallholders to experiment with techniques and ideas, and adapt, evaluate and select the practices most appropriate for their local specific situation. Their capacity to experiment was gained by learning through experience, e.g. learning by doing, seeing, discovering and experimenting. This form of learning is thought to encourage farmers' reflection and increase their analytic capacities for generating technical and

social solutions to their natural resource utilisation and agricultural problems (Hagmann et al 1999). Social and technical innovations are closely inter-linked and can seldom function effectively alone. Many technologies that improve utilisation of the local natural resource base require that all resource users within a given geographical space agree on certain rules and regulations.

2.4 TECHNOLOGY: TOWARDS PRO-POOR PARTICIPATORY TECHNOLOGY DEVELOPMENT

Transfer of Technology

A considerable share of current research recommendation and national extension advice to farmers are subject to systematic methodological and institutional bias and are frequently inappropriate for poor farmers. Much of the agricultural technology in East and Southern Africa suffers from one or more of the following shortcomings (Friis-Hansen 2000):

- Based on research managed on-station or on-farm research trials with inadequate interaction with farmers or other stakeholders and insufficient adaptation to smallholders conditions of production;
- Focus on technical issues alone or sub-quality economic and social analysis and to institutional and management-based solutions to agricultural problems;
- Participatory approaches to involve farmers limited to consultations before and/or after the research, while not allowing client influence on research objectives, methodology or setting of criteria for validating results; and
- Use of blanket recommendation and insufficient attention given to location specific or socio-economic or cultural differentiation between social or ethnic groups.

Farming Systems Research

The Farming Systems Research (FSR) approach developed in the 1970s was an attempt to recast agriculture as a multi-faceted economic activity and broaden the specialized technical perspective then prevalent among researchers. The approach encouraged examination of financial and economic benefits when developing recommendation packages, especially with respect to fertilizer and agro-chemical usage. It also increased recognition of the importance of an inter-disciplinary perspective in dealing with farmers' concerns. However, FSR remained a largely extractive process in which researchers sought to understand the economic context in order to tailor their design of technologies to farming conditions (Collinson 2001).

Participatory Technology Development

The search for new research-extension approaches in the post-adjustment period has not been motivated solely by funding shortfalls, however. With the true price relationships emerging from liberalization and the end of subsidies, the cost of external inputs for crop diversification and technological improvement may be simply too high for smallholder producers. Low external input solutions are closely related to a more efficient use of local resources, including natural resources and household labour (Friis-Hansen and Boesen 2001). International agricultural research centres have largely recognized this fact and new paradigms have emerged over the past decade, including Integrated Pest Management (IPM), Integrated Plant Nutrient Management (IPNM) and Participatory Plant Breeding (PPB).

The potential for science and agricultural research to generate technologies that are relevant for poor farmers is limited. Development goals have to replace scientific goals for agricultural research. There is a need for specificity, in terms both of taking into consideration the socioeconomic and agro-ecological characteristics of a locality and of the nature of the technology to be transferred. Distinctions need to be made in dealings with smallholders according to their degree of opportunity for market integration. The characteristics of technologies and their application at farm level need to reflect the new price and trade realities. At the same time, resource management practices must be adapted to new input-output price relationships. Farmers have to become more cognisant of the importance of generating efficiencies in their livelihood strategies and resource use and of using available technology optimally (Friis-Hansen 2000, IFAD 2002, Dorward, A., Kydd, J., Morrison, J., and Urey, I. 2001).

The corollary of increasing diversity in the approaches adopted for technology development and transfer is that the intermediaries between sources of supply and recipients require suitable skills to analyse a given situation, apply techniques appropriate to the conditions and help farmers to act optimally according to need and circumstance. Requirements will vary not only according to social, natural, financial and organizational circumstances but also in relation to the inherent nature of the technology (Douthwaite 2001).

Implementation experience provides a strong argument for change agents to be more circumspect in adopting a package-based approach to technology promotion, focusing attention instead on the farmers themselves as resource managers and on key aspects of farm level economics. This new direction will entail examining means to generate cost efficiencies in production, labour efficiency and higher levels of profitability in overall farming operations, perhaps through shifts in the balance of the farm's constituent elements in order to maximise

opportunity for capital accumulation and growth. Encouragement could be given to creating incremental production, productivity and income gains in existing operations rather than seeking a single, seemingly attractive technical solution that may bear little relation to the feasibility of adoption. Under the resource-based approach, technology will be introduced as the farmer deems relevant and appropriate as part of an ongoing management strategy.

For many smallholders, the problem is not whether technology exists or can be adapted to suit their overall requirements and circumstances, but how access to its use can be gained. A substantial proportion of existing technology has remained out of reach to poor smallholders. Depending upon farmers' circumstances and production capacity the technology could become financially viable (i.e. accessible) again if farming practices and efficiencies were to be adjusted suitably or organizational measures introduced by farmers and other stakeholders to minimise input costs at local level (IFAD 2001).

Gradually the emphasis in determining research content has shifted from reliance on researchers observations of the farm environment, through structured systems of consultation with farmers and analysis of their socio-economic circumstances leading to researchers' modification of program content, to systems in which farmers participate actively in research planning, the early testing of technologies and evaluation of their effectiveness before they are recommended for wider adoption (Douthwaite 2001).

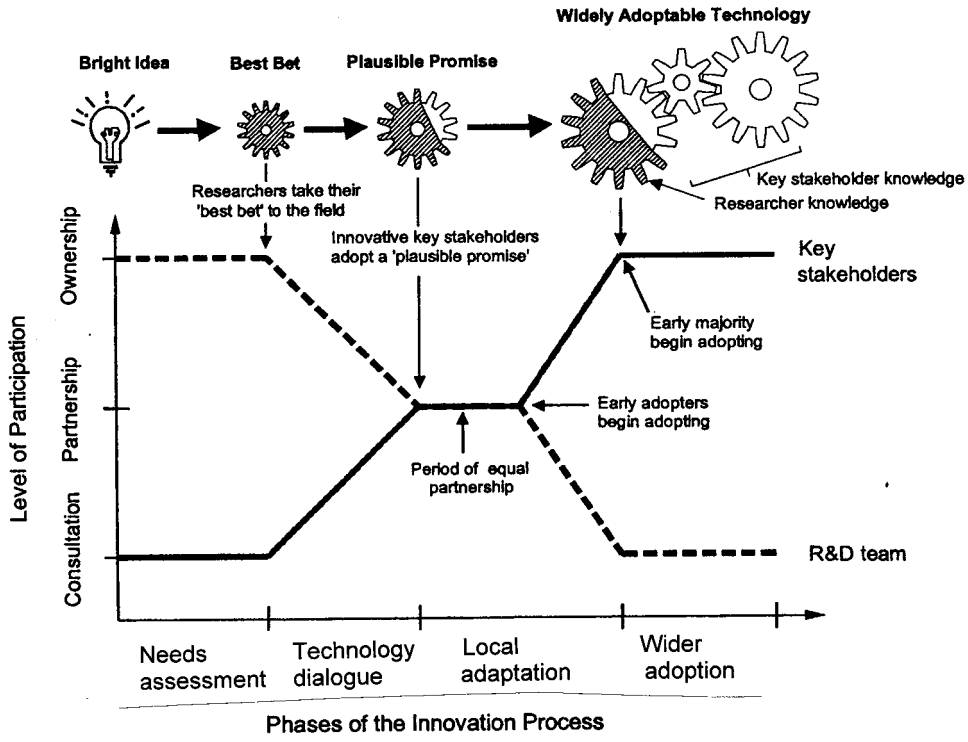
Increasingly, farmers are represented in research planning fora and contracted research investigations, while participatory plant breeding programs are being designed to involve the end users in breeding and selection programs. These types of farmer involvement are expected to increase the relevance of research and contribute to a more cost-effective application of public funds to the study of matters of priority concern to farmers.

Participatory methodologies, designed actively to engage intended beneficiaries in multiple aspects of technology development and transfer, have proved invaluable in increasing the intrinsic relevance and acceptability of technology. However, the contrasting perspectives of agricultural/biological scientists and field-oriented extension personnel on development concerns and the nature and role of technology has led to a slower embrace of participatory methodologies by researchers. There is a need for more all-inclusive forms of village level interaction to enable the voice of the more vulnerable groups to be heard. There appear to be four phases that are common to the various emergent models of participatory technology development (PTD), as represented schematically in figure 1.

The four phases of participatory technology development comprise (Adapted from Douthwaite 2001):

- a needs assessment, comprising both a technical review of agricultural problems in a given area, (such as the identification of pests and how they affect crop production), and a social consideration of what technology may be suitable for different groups;
- technology dialogue, given that indigenous knowledge and technologies are often well adapted to local agro-ecological conditions and integrated in social-cultural practices, but emphasizing that there is scope for improvement by involving farmers in the formulation and implementation of research and the evaluation of solutions;
- technology adaptation for a period in which a larger number of farmers fine-tune input requirements and management practices to their production preferences; and
- technology expansion as widely as appropriate for a given development.

Figure 2.1. The Learning Selection Approach: Phases of the Innovation Process



Source: Modified from Douthwaite, *Enabling innovation: a practical guide to understanding and fostering technological change*, page 218, 2001.

Typically, a research and development team is the driving force in the early stages, followed by a phase of equal partnership, and ending with the stakeholders in charge of technology dissemination with the facilitators withdrawn to the role of consultants.

The criteria for what constitute relevant technology for poor farmers have changed as the use of high levels of external inputs and crop husbandry is no longer economically or environmentally viable for many farmers. It is not possible a priori to define what constitutes relevant technology of a given group of farmers, indeed, appropriate technological solutions will vary widely depending on local circumstances. What constitutes relevant technology has changed over the past decade in ESA, as the use of high levels of external inputs and crop husbandry are no longer economically or environmentally viable for many farmers (Friis-Hansen 2000, IFAD 2002).

In considering access to agricultural technology it is helpful to recognize the term "technology" as encompassing not only knowledge and information about techniques and material goods but also the material inputs themselves, such as seeds and planting materials, fertilizers, agrochemicals and veterinary drugs, tools and equipment. Farmers' access to technology thus becomes not only a matter of their awareness of the technology's existence and its inherent technical relevance to their particular circumstances, but also of their means of access and incentive to seek access to the technology. These in turn raise related matters of organization for access, sources of finance, input supply mechanisms, market availability and marketing arrangements and input/output price relationships (Friis-Hansen (forthcoming, Douthwaite 2001).

If farmers are to adopt potentially advantageous technologies, they must gain access to the material goods involved. Typically in the past, farm inputs and credit financing have been made available by varying combinations of specialized public sector agencies, parastatal organizations or the private sector. Unfortunately, extension services have frequently been used as a supply conduit for material goods and credit as well as information and technical guidance and the resulting expansion of village extension workers' role has caused considerable conflicts of interest. The widespread adoption of systems of input and market provision and financial services in the public sector has created an ingrained dependency among farmers on government support. Real price relationships have been distorted, the sustainability of access to technology fundamentally undermined and opportunities lost for encouraging alternative, potentially self-sustaining, supply mechanisms based on real costs to emerge (Friis-Hansen 2000, Ponte 2002, Gibbon 2002).

Participatory technology development has resulted in a more diversified and locally (agro-ecologically and socially) adapted range of agricultural crop production technologies emerging that minimize the dependency of external seasonal inputs and use local biophysical inputs more efficiently (e.g. integrated pest management, (IPM), participatory plant breeding (PPB) and integrated soil fertility management (ISFM)) (Friis-Hansen and Stapith, eds. 2000).

Successful adoption of a technological innovation that can improve the productivity of smallholder agriculture often require farmers to change their management practice – often with consequences such as increased labour input, opportunity costs or changes in the division of labour. Even if an external actor (i.e. agricultural researcher or technology design team) were able to suggest an optimal management practice, the actual management change is the outcome of a negotiation process between farmers (i.e. within a household and/or between households within a community). Adopting and using such technologies may be more demanding for farmers in terms of knowledge and local level of organization (Friis-Hansen and Boesen 2001).

3. Review of the Current Publicly Funded Extension System in Tanzania

3.1 EXISTING EXTENSION SYSTEM

Over the past decade, the government has made considerable investment in the extension service, including launching the National Agricultural and Livestock Extension Rehabilitation Project (NALERP) in 1989, which primarily succeeded in putting in place a unified extension system following the Training and Visit (T&V) approach. However, the system proved to be top-down managed, not adequately responsive to farmers needs, and unsustainable.

The follow up intervention was the launching of the National Agricultural Extension Project Phase II (NAEP II) in 1997. This project sought to use the participatory approach while retaining the useful elements of the T&V approach. NAEP II advocated giving an effective role and voice to farmers and it initiated a process of private sector participation in extension. NAEP II performance at mid-term was not satisfactory.

This was in part linked to government's decision to decentralize responsibility for delivery of extension services to Local Government Authorities without adequate preparation of the local governments for the transition. As part of its decentralization reform (MRALG 1998) Tanzania re-located a large proportion of its extension staff from the head quarters and regional levels to the district level. However, the extension staff has remained employed by, and therefore in part answerable to and/or in certain aspects dependent on, the central ministry (e.g. promotions, transfer, etc.). The situation was further aggravated by the division of the then Ministry of Agriculture and Co-operatives (MAC) into three Ministries namely: Ministry of Agriculture and Food Security (MAFS), Ministry of Co-operatives and Marketing (MCM) and Ministry of Water and Livestock Development (MWLD). This division necessitated a re-definition of roles and responsibilities and significantly reduced the capacity of each individual ministry.

The links and participatory dialogue between national institutions of research and extension, on the one hand, and local specific groups of farmers, on the other, have only improved marginally, if at all, as a result of the reforms of R&E and deliberate attempts to combine the T&V methodology with participatory methodologies. This aspect is the weakest aspect of GoT and WB's efforts to improve efficiency of R&E through the NAEP II and TARP II projects.

A detailed analysis and/or review of extension theory and practice in Tanzania is contained in various government documents (e.g. MAC 2000a, b, c) and consultancy reports (e.g. BACAS, 1997). From the colonial period to-date, Tanzania has emphasised modernization of agriculture and agricultural extension was (and is today) seen as a means for achieving this objective.

Agricultural extension in Tanzania has been, and still remains, almost entirely financed by the public sector but highly dependent on external funds (e.g. World Bank, IFAD & FAO). Over time, the focus of extension has been on the transfer of technology leading to government adopting systems and/or approaches to extension that have been mere extrapolations from approaches in donor countries and have essentially been supply driven, top-down and manipulative (Rutatora and Mattee 2001). The adopted systems/approaches never took into consideration farmers' issues, concerns, problems, needs and never involved farmers in the formulation stages. In addition, they never undertook systematic investigation of farmers' expectations regarding extension and the role it should play. As a consequence, they ended up promoting and disseminating recommendations that were incompatible to local circumstances and ended up being only partially adopted or rejected (Rutatora and Rutachokozibwa, 1995; Moris, 1991).

Despite the introduction of the farming systems approach to research and extension and the Training and Visit (T & V) system of agricultural extension (whether in its original or modified form employing a group approach), smallholder farmers are still perceived as the recipients of new or improved technologies generated through scientific research paradigms (Rutatora and Wambura, 2002).

The situation was aggravated by government dominance in extension management, while coordination with the private sector, church-based organizations, and other Non-Governmental Organizations (NGOs) as well as farmer-led initiatives have often been minimal. Literature reveals that from the very beginning, extension services in Tanzania were offered through what has been termed the banking (Freire, 1970), top-down and bureaucratic (Kauzeni, 1989), empty-cup or directive (Keregero, 1991) and supply-driven or manipulative (Rutatora and Mattee, 2001) approach. All too often, extension services have been structured and operated on the assumption that farmers are largely passive, ignorant, illiterate, conservative, naive and unable to improve or integrate new farming practices into their established agricultural systems.

In view of the above, it appears to be a fact that existing extension systems and/or approaches whether in their original or modified forms have not provided sufficient flexibility and have not been of benefit to a good number of smallholder farmers. Many of the largest government extension systems have neglected the opportunity to organize and facilitate farmers' groups, empower their clientele, press for equity and accountability and demand sustainability of fields and streams. As such, much criticism has been centered on agricultural extension due to its failure to make a significant impact on smallholder agricultural systems.

According to Moris (1991) and the Main Report of the Task Force on Extension Reform (MAC, 2000b) which also captured observations made in the Mid-Term Review Report of the National Agricultural Extension Project Phase II (NAEP II), failure of past extension approaches is mainly due to:

- Poor targeting and involvement of farmers.
- Inadequate funding and lack of rural financial institutions.
- Inadequate identification of farmer problems and feedback of farmers' requirements into research agenda.
- Lack of relevant technological messages.
- Weak research-extension-farmer linkages.
- Lack of mechanisms for accountability to clients.
- Inappropriateness of contact farmer methods.
- Inadequate support services like credit, market and inputs.
- Poor motivation or incentive packages for extension staff.
- Lack of management training and appropriate planning, monitoring and evaluation systems for programmes or projects.
- Inadequate utilization of information and communication technologies including popular theatre or theatrical methods (e.g. drama, songs and role-plays).
- Lack of clarity about what is expected from extension and failure to match resources with designated functions.
- Lack of political support.

These problems translate into two related issues: lack of resources and lack of relevance and efficiency.

According to lessons learned from World Bank experiences including NAEP II, the following observations focusing on issues external and internal to extension systems were made. In case of external issues it is argued that "Effective extension systems cannot be established quickly

and are costly to operate. Extension also cannot be considered alone. It needs a supportive environment that includes a long-term commitment to agricultural growth expressed through the provision of adequate agricultural support services, of which extension is but one, and macroeconomic policies that, at a minimum, do not disfavour agriculture. Extension should not be left to government alone: a combination of private, public, and voluntary institutions facilitate the extension process. The other lessons are internal to extension. Agricultural extension requires effective organization and management and appropriate field methodologies. However, there is no single extension system that has universal acceptability. Extension systems must respond to changing policies, changing farmers' needs, and the findings of monitoring and evaluation. Finally, farmer participation is fundamental to sustainable extension. Not only should farmers participate in formal extension as users of information and providers of feedback, but they should also be involved in programme development "(FAO, 1990)".

3.2 RATIONALE FOR EXTENSION REFORM IN TANZANIA

In view of the observations made above, there have recently been policy changes within GOT regarding the reform of extension in Tanzania. The following lessons have been highlighted in recent documents regarding reform of agricultural extension:

- Lessons from past and current attempts reveal that efforts made by the government and the donor community have not yet yielded significant impact in terms of increased production, improved incomes, household food security and general standard of living of the rural poor.
- The landscape is changing with regard to the provision of extension services in Tanzania in terms of key actors, approaches and management styles of extension services. At the same time it is becoming increasingly evident that the extension services are becoming more and more dependent on donor funds through MAFS or NGOs. There is, therefore, a real concern about how extension services can be made to work in the long run, and how various actors, including the intended beneficiaries, can support agricultural extension, so that the services continue to perform at the expected level in the future.

- Observations reveal that several NGO and farmer-led initiatives have, over time, supplemented delivery of public extension services with cost sharing, but these experiences have not been formally integrated into the public extension system nor has their potential to reduce public expenditure and improve the quality of the extension service been considered. There is also a growing recognition that uniform, hierarchical government bureaucracies are not the best way of providing a flexible service tailored to the needs of different categories of farmers working under varied agro-ecological and economic conditions.
- In addition, our understanding of how the activity of extension works has also changed from the *technology transfer model* to the present *participatory problem solving approach model*, which aims to *empower* farmers and their farm families. This view, which is based on *adult_education* models, recognizes the need for greater *interaction* and *participatory dialogue*, and acknowledges the farmers' expertise in identifying problems and selecting options for improvement.
- One of the emerging issues is that extension strategies face the dual challenge of supporting market competitiveness for commercial agriculture operating in a global market, while also addressing poverty in rural areas. Hence, the agenda for many extension programmes must shift from an exclusive focus on agricultural production to a broader range of services relating to marketing, environmental conservation, poverty reduction, and off-farm activities.
- Another reason compelling reform is the government's decision to decentralize extension services to local government authorities where extension services can be made efficient and responsive to farmers' problems and needs. The thrust is to have the extension services, among others, well nested at the lowest appropriate level of government.
- In parallel, the government has embarked on a major reform initiative under which government's role would be limited to core governance functions, commercial activities would be passed on to the private sector, the roles and functions of Ministries would be rationalized and, consequently, the civil service downsized. The regional government has been restructured and reduced in size with the intent of enhancing the district focus by transferring resources from the regional level to the districts and making district administration community based.

The implication of the above is that the government has the impetus to reform the extension service and develop a plausible strategy for extension which is likely to be pluralistic and encompass the adoption of multiple approaches to extension. In addition, cost considerations and the limited success of single system approaches point to the need for action.

In summary, decentraliszation, privatization, cost recovery, and participation by stakeholders within a pluralistic financing and delivery system are some of the major reforms being pursued in extension's current transition. Institutional design and/or transformation are seen as crucial elements for the success of these reforms, and worldwide experience with a variety of institutional approaches suggests a convergence of ideas about basic options for system reforms.

One of the goals of the public sector reforms is to improve the delivery of, and access by the public to, services, including agricultural extension services. One way of achieving this is by transferring resources to the District level, and by making Local Government Authorities responsible for the provision of most public services. Accordingly, under the Local Government Act No. 6 of 1999, the responsibility for implementing agricultural extension services has been placed with the Local Government Authorities. The idea is to be as near to the people as possible.

However, the idea of decentralizing the extension services to the District level brings into focus other pertinent questions on how to make District managed services more effective and sustainable in the long run. In other words, how can the participation of farmers, as key stakeholders, in the agricultural extension system be increased, thus enhancing the sustainability of extension in the face of declining public funding. At a 1997 workshop of major stakeholders in agricultural extension as well as subsequent workshops (e.g. MAFS, 2002), it was resolved that in order for farmers to be key players and to participate fully in the sustenance of the services, there was a need to develop a new model of extension management at the district level, demand-driven, cost-effective, gender-sensitive, sustainable, and targeted to specific categories of farmers, whose needs the system should be able to respond to.

What is at stake, therefore, is how extension services will be managed at the district level in order to make the services demand-driven, sustainable and responsive to the needs of the different categories of farmers. In a demand-driven extension system, the role of farmers is to take the initiative in demanding certain services, contribute towards the services, and play a key role in determining the direction of extension services at the District or even at lower levels.

The issue of sustainability arises because of the decline in public funding for public services and the recognition of the necessity of finding alternative financing mechanisms, including the possibility of the beneficiaries meeting part of the costs of the services. Local government

authorities, therefore, have to be concerned about how they will ensure that the extension services are available to all who need them, at affordable costs, and that the services are cost-effective to the beneficiaries, who will otherwise not be willing to pay for them. Thus, sustainability will have to be looked at in terms of the extent of community ownership, participation of beneficiaries in cost-sharing, willingness of farmers to share knowledge and experiences, and the identification of diverse sources of funding.

3.3 EXPERIENCES WITH PILOT PROJECTS UNDER NAEP II

According to the Staff Appraisal Report of NAEP II, a component on pilot initiatives was provided for in order to pilot alternative approaches to the design, implementation, funding and monitoring of extension to increase farmer participation and private sector involvement. It was envisaged that over a five year project period, best practices would be documented and shared among the pilots in an effort to upscale the most promising approaches and/or strategies.

At the time of NAEP II a number of pilot projects were identified, some of which were to be financed by NAEP II, while others required separate project outlines and funding support. Some of the NAEP II Pilots discussed here are those whose evaluation reports are available and include the Mogabiri Extension Micro-Project (MEMP), Kitere - Mahurunga Rice Improvement Micro-project (KMARIP) and Promotion of Production and Consumption of Micro-Nutrient Rich Fruits and Vegetables in Igunga District.

Mogabiri Extension Micro-Project (MEMP)

The Mogabiri Extension Micro-Project became effective in September, 1998 and was implemented by the Mogabiri Farm Extension Centre of the Diocese of Mara (Anglican church) in collaboration with Tarime District Council and the then Ministry of Agriculture and Cooperatives (MAC), covering 18 villages in the Tarime highlands. The overall objective was to establish a farmer-based, participatory, cost-effective and sustainable extension service in the micro-project area.

Based on the June, 2001 Evaluation Report, the following lessons could be drawn.
An attempt was made to establish a farmer–based participatory and cost effective extension service through use of Farmer Motivators (FAMOs) and overall farmer empowerment which aimed at developing people's capacities to initiate actions on their own and/or to influence decisions pertaining to planning, implementation and monitoring of extension services in their areas of jurisdiction.

Farmer motivators were found useful in terms of:

- Providing local agro-ecological, socio-economic and cultural knowledge and understanding.
- Using a common language (in both linguistic and cultural senses) with farmers.
- Demonstrating what can be done with similar resources and background.
- Their ability to expand project activities.

Although FAMOs were found useful in terms of coverage of more farmers and villages, they were found to lack confidence due to poor selection and inadequate training, something which may raise issues of quality control. Hence, this calls for a need to revisit the institutional arrangements under which FAMOs operate and/or function.

MEMP, through its farmer-based participatory extension approach, has improved farmer incomes and household food security as a result of increased crop and livestock productivity enhanced by adoption of appropriate or ecologically sound technologies.

The sustainability of using FAMOs in place of VEOs was found uncertain due to failure by a good number of farmers (especially those dealing with crops) to pay a token fee for the services as part of the cost-sharing mechanism.

Gender issues were effectively integrated in all project activities as a result of bottom-up planning and participation in decision-making.

Kitere – Mahurunga Rice Improvement Micro-Project (KMARIP)

The Kitere-Mahurunga Rice Improvement Micro-Project was launched in November, 2000 and is being implemented by the Mtwara District council in collaboration with the Ministry of Agriculture and Food Security. KMARIP was designed with the objective of piloting technology transfer on water management aimed at efficient utilization of water for improved rice production. The project involved rehabilitation and/or construction of canals and demonstration of rainwater harvesting technologies.

The following lessons emanating from KMARIP are drawn based on the evaluation that was conducted in May, 2003.

Increased rice yields (from 0.6t/ha – 2.4t/ha.) resulted from the adoption of ecologically sound technologies and appropriate water management techniques enhanced by strengthened extension services (including timely delivery of inputs) and committed extension officers.

High inputs prices (e.g. chemical fertilizers) and absence of credit as well as labour – intensive technologies (e.g. construction of bunds for water control) impair the extent to which technologies can be adopted by farmers and their farm families.

Promotion of Production and Consumption of Micro-nutrient Rich Fruits and Vegetables in Igunga District.

The micro-project, whose objective is to promote production and consumption of micro-nutrient rich fruits and vegetables, was initiated in December, 2001 and implemented by Igunga District council in collaboration with the Ministry of Agriculture and Food Security. Although the micro-project espouses a community-based participatory approach, it utilizes primary and secondary schools as an entry point to communities. According to an evaluation report of May, 2003 the following lessons emanate from the project .

Increased household income and improved nutrition, especially for vulnerable groups, result from improved technology transfer and utilization.

Increased awareness and utilization of micro-nutrient rich foods in the project area resulted because of the involvement of primary and secondary schools (which also conveys the message to neighbouring communities), which instills in school children a positive attitude toward agriculture.

Overall, it has been demonstrated that if criteria for selection of micro-projects are adhered to, it is possible to document some best practices related to extension management, improved technology transfer and farmer empowerment which might be up-scaled to other areas.

4. Experiences with Client-Driven Approaches in Selected Interventions

4.1 KAGERA AGRICULTURE AND ENVIRONMENTAL MANAGEMENT PROJECT

Participatory Technology Generation

The KAEMP approach to technology generation comprises a participatory needs assessment followed by a review of available technical knowledge and planting material, which are then compiled into relevant technologies in a participatory dialogue between KAEMP staff and farmers. This dialogue resulted in adjustments to the suggested technologies. A range of the technologies is today promoted by KAEMP, including pathogen free banana planting material and associated integrated pest management, knowledge about how to keep the banana plants free of pests and diseases, cloned coffee plants, soil fertility improving legumes and fallow species, vanilla plants for crop diversification, bio-pesticide herbs, and many others. The technologies seem to be able to significantly improve the productivity of poor farmers.

As a consequence of the initial participatory technology generation dialogue between KAEMP staff and farmers, a number of research needs were identified, as well as relevant technologies. KAEMP contracted ARI Maruku to undertake four adaptive research studies:

- Evaluation of the effectiveness of botanical extracts (based on both exotic plants identified by ICIPE and local plants identified by farmers) on control of coffee rust (CLR) disease and coffee berry moth (CBM);
- Evaluation of local cassava land races for cassava mosaic and green mite resistance;
- Evaluation of the effect of integration of plant residues and mineral fertilisers on soil fertility and quality and quantity of composting materials;
- Evaluation of different legume plant species for fertility restoration.

The KAEMP approach to participatory learning and technology adoption is Integrated Pest Management/Integrated Nutrient Management (IPM/IPN) groups, in which some 25 farmers, facilitated by an agricultural extension worker, observe and learn about technologies generated by KAEMP on five fields owned by group members.

Participatory Technology Learning and Adoption: IPM/IPN Groups

KAEMP has developed an innovative participatory learning approach to technology dissemination among poor farmers, by organising farmers in Integrated Pest Management (IPM)/Integrated Plant Nutrition (IPN) groups including approximately 25 farmers and facilitated by the local agricultural extension agent, district co-ordinators and KAEMP specialists. Each group works on five fields, owned by group members, which function as the groups' experimental laboratory where they observe and learn about technologies generated by KAEMP, while the production from the fields belongs to the owner of the field.

The selection of participating groups involved sensitization campaigns between KAEMP staff and village governments followed by public meetings during which farmers were briefed about the project and asked to volunteer to become members of the IPM/IPN groups. Groups are encouraged to formulate their constitutions and acquire a legal status through registration as farmers' associations. The constitutions lay down the rights and responsibilities of group members. Each group has a leadership that includes the chairperson, secretary and treasurer. Apart from the traditional formal positions mentioned above, groups select members to other positions such as discipline overseer, adviser, etc. according to needs.

The IPM/IPN philosophy has three basic components:

- To grow a healthy plant; to conserve natural enemies; to observe fields on a regular basis; and to make farmers experts on their own fields. These are achieved through different learning and technology dissemination techniques including:
- On Site Training - Learning by Doing. This method involves on site training of IPM/IPN working groups by demonstration. Demonstration plots of about 0.1 hectare serve as training sites where farmers within and outside the village can visit to learn and experiment various farming techniques. Farmers are also encouraged to set aside two plots: one for IPM/IPN practices and another for traditional practices in order to compare their performance. A group member has to enter into agreement with KAEMP that she/he would provide a field to be used as a demonstration plot. KAEMP then pays for the full establishment of the demonstration plot and supervises its management.
- Farmer-to-Farmer Visits. Intra group visits were funded by the project as part of a technology generation and dissemination learning process. This allows learning through observation, discussion and interaction among peer group farmers. Host farmers demonstrate IPM/IPN technologies as jointly planned with the village extension worker.

4.2 MARA FARMER INITIATIVE PROJECT

Support for Devolution of Power from LGA to Farmer Groups

The ongoing decentralization reform has increased the importance of capacity building within the emerging district administrations. MARA-FIP has delivered material assistance to LGA structures in the Mara region, particularly in terms of transport and office equipment and with incremental recurrent costs. The MARA-FIP design gave a central role to interaction with beneficiary communities, including the project target groups, either through existing village administrative structures or through new groupings and to establishing local development management capacity that could identify priorities and maintain a dialogue with external stakeholders. Within such an institutional set-up, other farmer groups could be formed around specific economic activities. In practice MARA-FIP has, through an NGO (CARE), supported user group formation and savings mobilisation in the region. MARA-FIP has been successful in group-mobilisation and in directing resources to interested beneficiaries. However, the second and much more challenging task of building management capacity and effectiveness within the mobilised groups on the basis of their own resources has been far less successful.

The participatory interaction between MARA-FIP/CARE and farming communities appears to have been employed mainly for initial problem solving analysis and setting priorities within a limited menu of project interventions3. The focus of MARA-FIP/CARE thereafter shifted to establishment of single-purpose user groups around chosen investments or activities. As a consequence, many user groups have been formed in response to "awareness creation". The implementation mechanisms that have been adopted include a large degree of self-selection by beneficiaries, which has resulted in mobilizing farmers from the target groups in the crop components. There is however, a danger that some groups were formed with the purpose of accessing donor funds and do not have the ability to manage, operate and maintain structures and activities beyond the project life. This may be the case with the saving groups in which the interest of many members became muted once it had become clear that, (rightly), no supplementary credit funds were available to boost group savings4.

[3] IFAD. Mid Term Review of MARA-FIP.

[4] Ibid.

Client-Oriented Research with a Farming System Perspective Approach

MARA-FIP supported client-oriented research with a farming system approach. This approach has been implemented through contracting research institutes. This approach to research involves farmers (as passive respondents to researchers' inquiries) in the need assessment phase and in researcher designed and managed on-farm trials. Farmers, however, have no influence over criteria for evaluating research results and the decisions about which practices to promote.

Support for multiplication of pathogen free planting material of an improved cassava variety combined with research and training in IPM principles has revitalized cassava production in the Mara Region. Farmers who have been supplied with pathogen free planting material are self sufficient with planting material and will for a period of time have no need to access planting material from others. However, seed born pest and diseases are certain to build up in cassava plants over time and yields will decline if farmers do not have periodic access to pathogen free planting material. Community based production of seed and planting material is only likely to be sustainable if a number of conditions are met, including (i) establishment of a product which is distinguishable from local planting material and (ii) annual access by producers of improved cuttings to pathogen free planting material from research stations. Institutional requirements for the first condition are likely to include organising producers of planting material into seed associations and establishing an appropriate regulatory seed framework that enables the local seed association to test and label its members products as 'quality declared seed'. The existing seed act in Tanzania only operates with a 'certified seed' category.

4.3 FAO/GLOBAL IPM FACILITY FARMER FIELD SCHOOLS IN KAGERA REGION

FFS Approach to Participatory Learning

As noted by Nyambo and Kimani (1998), "Farmer Field Schools are an informal farmer driven 'bottom-up' education approach, which emphasise farmer empowerment through participatory technology development and transfer as well as the acknowledgement of the indigenous knowledge of farmers and their experiences." It gives an opportunity for the key stakeholders (farmers, extension workers and researchers) to interact as partners in the development of IPM options. There is an emphasis on discovery learning. FFS is a group approach to agricultural technology development among farmers that focuses on adult - non-formal education through hands-on field discovery learning. Through continual monitoring of the fields farmers are able to detect and solve field problems.

The FFS approach also emphasizes four principles of IPM: 1) to grow a healthy crop; 2) to conserve natural enemies of insect pests; 3) to monitor the fields regularly; and 4) to become IPM experts through participation in FFS. FFSs are oriented to providing basic agro-ecological knowledge and skills in a participatory manner. The objectives of FFSs are to improve farmers' analytical and decision making skills, to develop expertise in IPM, and end dependency on pesticides as the main and exclusive pest control measure. In Kagera region the FFS approach started in 2000 and is used for banana and cassava production systems. These key food crops are highly infested and their production has been undermined by severe soil infertility.

Farmers' Participation in FFS

After the training of trainers, and the sensitisation of village communities, a village assembly is called and the assembly elects the members to each FFS. In each participating village there are two to four FFSs. As villages have a scattered homesteads structure, FFSs were organised to represent village neighbourhoods. There are 77 FFSs distributed among 21 villages in Bukoba district and 18 villages in Muleba district (2001 data). The FFS elects its leaders including the chairperson, secretary and treasurer. In some groups such as that of Ilogero, a discipline overseer with responsibilities of regulating individual's behaviour is also elected. A constitution stipulates rules and regulations of the group, as well as rights and responsibilities of its members. Attempts are underway to obtain a legal status through registration. It is the intention of organisers that FFSs should become more permanent groups that can cater for other issues.

At each village, groups were made in such a way that they are representative of the village neighbourhoods /sub-areas. The size of FFSs range from 25 - 30 members. This limit is due to budgetary constraints. Groups are encouraged to have other sources of funds, e.g. a commercial field where crops are grown for sale or self-sponsoring, where a member may decide to contribute 2 bunches of banana to the group. FFS have group identity - name, adviser / patron. The FFS approach recognises the importance of gender balance. An equal opportunity is given to males and females to participate in FFSs. Out of the 1703 farmers involved in FFSs, 701 (41%) are females. The number of males is twice the number of females in only 27 out of 77 FFSs. In 23 FFSs females outnumber males, and in two FFSs the number of males and females is equal. Females are active also in leadership, with one of the top three leaders, always being female. Both males and females participate in all activities. In Ilogero village, for example, men found it difficult to cut and transport grass because this is traditionally a woman's job. But they were slowly getting used to it. Women’s participation is also important in dissemination of technologies, as they are often involved in many other village groups where they interact with other villagers.

There is a good relationship between FFS and the village authority. A number of village leaders participate in FFSs. Village authorities are often invited to various FFS occasions such as meetings. Based on qualitative information, it was found that FFS members felt that they had a responsibility and obligation to advance agricultural technology on behalf of all the villagers. They were also looking forward to support from the village government through provision of land for practicing the acquired skills to generate income; facilitation by formalisation; recommendation for receiving credit; etc.

Each FFS is facilitated by a grant of USD 400, equivalent to Tshs 320 000. The grant is intended to cover costs of establishing a training site; training costs such as VEO's allowance; (Tshs 45 000); graduation ceremony (Tshs 80 000); farmer to farmer visits (80 000); stationery, etc. FFSs are encouraged to have their own bank accounts and they have a say on how best to use the money.

On Site Learning and Experimentation

FFS is based on field participatory learning. The field is co-owned by farmers rather than by an individual farmer. Access to such a field is often through a contract between the FFS and an individual farmer (often a FFS member) who volunteers to make the field available for the group to be used as a training site. The contract period covered ranges from two to five years. As the FFS on banana takes 18 months, a two-year contract is considered too short. Where the lease is for a fairly long period, farmers have the incentive to invest in the development of the field, as they are likely to benefit from the harvest. At the end of the contract period the field owner regains the exclusive right to ownership and use of the field.

The use of a jointly owned or leased field as a training site has some important implications on participatory technology generation. Joint ownership of the training field reduces risks of experimentation. Farmers can carry out experiments without worrying about personal risks. This allows them to take management decisions that might not have been taken for their own farms. Farmers are able to test a new method before applying it on their own farms, and this is important, as a technology may not necessarily work in a new location.

The fields used for training are selected from sites free from nematodes and weevils. There is only one training site per FFS. Field sizes range from 0.1 to 0.5 acre. The training field is divided into two parts: one section where farmers undertake farming as they are used to (farmers' practice) and one section where IPM/IPN techniques are used. This enables farmers to identify the differences and advantages of better techniques of farming as introduced through IPM/IPN technologies. Where two crops are involved, then the field is likely to be divided into not less than four parts. In addition to these, there has to be an isolation distance

between these parts to avoid pests and diseases from the farmer practice part infesting the field section used for experimentation. These fields appear to be very small to accommodate these requirements. It was not possible to establish the range of experiments farmers can make given the small size of the training fields.

Group discussion and presentation of field observations is an important way of enhancing farmers' participation. Each member is given an opportunity to participate. Local dialects are acceptable in presentations. As diagrams are used to represent the findings, the illiterate can somehow understand the items presented. However, illiteracy may hinder many farmers adequate participation in FFS activities.

The local language is used for training in FFS sessions. This gives a greater opportunity for local community members to participate in the learning process. However, Nyambo and Kimani (1998) have noted some limitations in the use of local languages. These include limited vocabulary for insects and plant diseases; existence of different languages and dialects make information exchange difficult; varying literacy level; poor infrastructure to enable information exchange between the FFS groups. FFS minimises some of these difficulties by use of drawings and live specimens.

Agro-Ecological System Analysis

FFS knowledge generation and dissemination is through agro-ecological system analysis (AESA), which is a discovery learning process. FFS members meet once a week to practice AESA. The VEO is available to facilitate the FFS only once a month. A FFS is divided into sub-groups of five. AESA involves first, data collection by these sub-groups through frequent observation of crops and fields. Observations cover land resources and management, weather, diseases, soil characteristics, nature of the crop / plants, etc. Specimens are collected from the field and findings are illustrated in flip charts. The drawings are kept as records for further reference in the future. Experiences elsewhere have shown that farmers have a far greater capacity to map, model, diagram, estimate, rank, score, experiment and analyse than outsider professionals have believed. The sub-groups present their findings and recommendations and the group holds a plenary discussion. AESA is therefore a tool that improves farmers' decision making through the iteractive process of analysing situations from multiple viewpoints, synthesizing the analyses, making decisions, observing the outcome and then evaluating the overall impact. It is therefore not geared towards immediate material output. Through AESA, farmers acquire a new role as observers, analysts, experimenters, monitors and evaluators.

AESA enables farmers to share information through group discussions and plenary sessions. This is also important for empowering the farmers. Eventually the farmers own the knowledge they have acquired. Qualitative data have shown that farmers value their opportunity to participate in discussions with other farmers as one of the benefits they have acquired from participating in FFS.

Group dynamics are sequences of activities for the purpose of group development. It is an exercise in strengthening teamwork and problem solving skills, promoting creativity and creating awareness of the importance and role of collective action (Braun, et al, 2000). Activities include problem solving, mental puzzles or brainteasers and are both enjoyable and offer an opportunity to work together towards solving a specific problem. In addition, FFS groups perform dances, singing, drama all serving to relay to the public and to members important messages related to technology generation and dissemination. They serve to build group cohesion and identity.

4.4 INADES FORMATION (IFTZ)

Vision and Shared Values

IFTz views development as an empowerment process through which farmers build on their knowledge and experience through action-research initiatives.

IFTz envisions a socio-political situation whereby smallholder farmers (women and men) in Tanzania are organised and possess genuine power to:

- Control their natural resources and channels of distribution of their produce.
- Become a negotiation power capable of proposing a sound policy in order to influence and develop national policies concerning their own development.
- Understand and implement the concept of gender and development so as to reduce gender problems in their societies.
- Be recognised and respected as farmers.
- Take preventive measures to control the spread of HIV/AIDS in their societies.

Action-Research-Training (ART)

Action-Research-Training (ART) is the principal strategy. ART may be defined as:

A constant questioning about ourselves and what we individually or collectively do, at personal, community or institutional level. It enables all actors involved to act more and

better, since it helps us to formulate new hypotheses; to check the latter through actions; and to formulate again new hypotheses, according to a cyclic and iterative process.

In this way ART becomes a permanent source of learning at all levels and in every sense; it enables all the interacting actors to enrich one another, and trigger social or political changes in the rural areas.

ART is founded on four basic principles:

- Full and effective participation of the people (farmers, groups, networks) as leading actors in conception, planning, monitoring and evaluation of the change process.
- Involving every actor, farmers and trainers in an interactive, egalitarian relationship that reinforces self-confidence and self-esteem, which farmers usually lack.
- The necessity to evaluate and learn lessons from any consensus reached, before questioning it. In this way, each actor develops his/her resources that teach him/her to learn.
- Permanent questioning of the solutions found through a reflection/action process. It involves constant questioning about ourselves and what we individually or collectively do, at personal, community and institutional levels.

Three components of ART:
Research: is founded on the observation that the process arises from hypotheses formulated by the actors. This is followed by actions planned for the implementation of these hypotheses, and the definition of accurate follow-up indicators for assessing the progress of the process.

Action: ART is built around the activities and actions of the people. After clarifying the hypotheses, the actors directly embark on implementation of actions so as to meet specific concerns. Such actions are taken as trials and are reflected upon by their actors, to assess whether they meet the immediate and real preoccupations of the actors concerned.

Training: occurs as actors learn from their actions. It takes place through re-reading the action and how it progresses. This is done through an evaluation comparing their results with the initial hypotheses. Successes, failures and deviations are noted, conclusions drawn (learning), and new hypotheses are formulated to be tried out, based on the learning acquired through action.

The cycle then repeats again but differently (i.e. iteratively) as visualised in Figure 1 below.

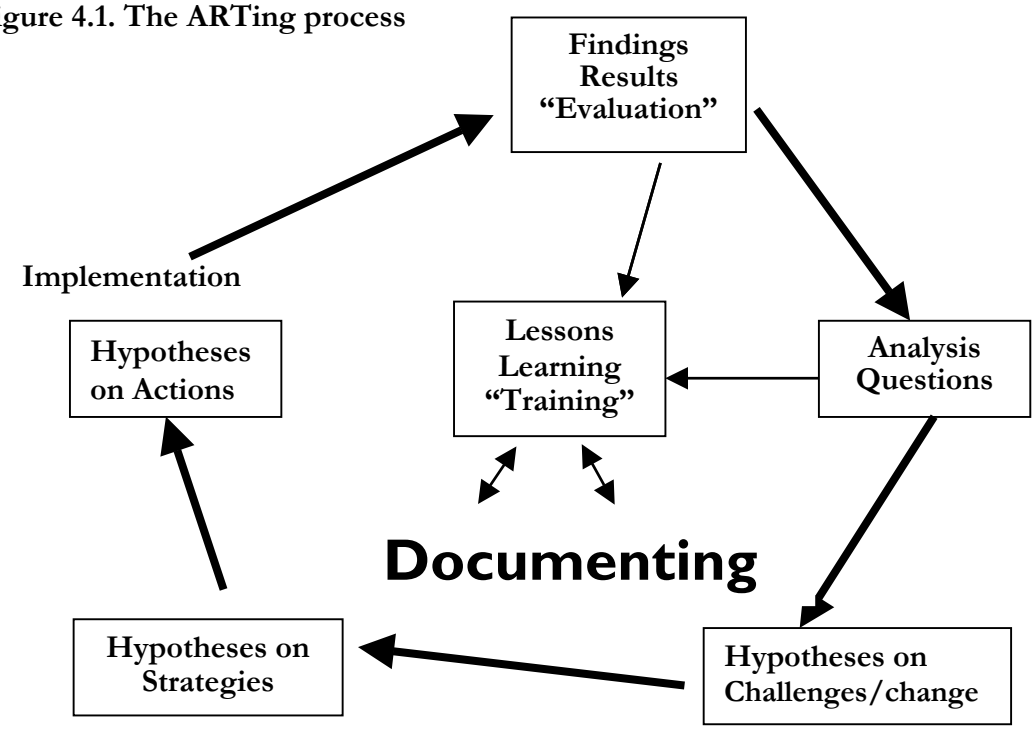
With the ARTing technique, capacity building occurs more through knowledge sharing and innovations rather than knowledge transfer. That is, true learning does not come from knowledge transfer but from reflecting on our own failures and achievements, with a view to building up new knowledge, know-how and behaviours.

These are the steps followed:

- Participatory Context Analysis marking the initial planning process: assessing environment, strengths and weaknesses, changes, trends, etc.
- Vision of IFTz and FOs: involves formulating hypotheses (on key issues and main challenges) in form of dreams and prospects for the future.
- POA of IFTz and FOs: involves developing an operational program specifying the strategies to be implemented and actions to be carried out, with a view to taking up the challenges and realising the vision. Also, this involves identification of other actors; planning of actions by FOs and support/back-up programme by IF (and other actors) etc.
- Implementation: i.e. experimentation of the planned actions.
- Self-monitoring and evaluation (PIM): questioning on results and impact, drawing lessons and findings, adjusting plans, developing new hypotheses and so on.

In this learning process emphasis is placed on building the capacities of FOs in analysing their situation and developing a collective plan of action.

Figure 4.1. The ARTing process



The Role of Trainers in the Learning Process

As facilitators of social change processes, trainers' major role is to create a learning situation. Specific roles include:

Go-Between: facilitating effective exchange among farmers and helping farmers establish effective contacts with other categories of development actors. IFTz trainers have gained experience in this role. They will need to reinforce it.

Catalysts of innovations: in helping farmers develop their **creative abilities** and value their potentials. This role has been highlighted by the existing farmer-research groups in IK and PFI. It will be pursued in this POA.

Facilitators of change processes: in helping peasants **discover and value** their dormant potential; link separate problems through identification of key issues; analyse trends; decide why, what and how to do; and link their actions with motivating challenges.

Developers of human resource: In the past years, we have seen many farmers emerge as real experts. We have 'used' them as resource persons, for both fellow farmers and technicians. Thus, the first preoccupation of trainers will continue to be "*What can I do to help this expertise emerge?"*

Mirrors: in helping farmers, men and women, look at themselves and their situations from new standpoints which enlarge their understanding of how they live and enable them to better act and react. As one female farmer once put it

"I learn where I come from and where I want to go; this is the education we need".

To successfully create a learning situation around each FO's activity, trainers must prepare each support activity: methods, tools, instruments and techniques to be used in facilitating the learning process. In the choice of methods, trainers need to show proof of creativity and flexibility depending on the group to be supported and the content of the support.

All this means that, when working in a given village, trainers must pay more attention to the village past and present situation, to the relational analysis within the village and of villagers with projects, to the dynamics, the stakes, the assets, the potentialities, the constraints… of each category of actors.

4.5 PELUM-TANZANIA

Farmer Empowerment

PELUM-Tz[5] point of departure is that active participation of all farmers in all stages (i.e. need identification, planning, implementation, monitoring and evaluation) of a project and in other decision-making processes in regard to their community development, indicates the highest level of empowerment.

PELUM-Tz uses farmers' participation levels in all aspects that touch their daily life as a measurement of empowerment in a farming community. In addition, the shifts of relationships between farmers' organizations and other institutions also reflects elements of empowerment. For instance, PELUM-Tz has managed to facilitate self-formation of strong farmers groups and networks in Rukwa, Mbeya, Iringa, Morogoro and Dodoma. Networks such as *MVIWAMBO, MUVIWAMBO and MTABIPEMA* in Mbozi have formed an effective joint-secretariat which has shown a high level of organisation and leadership, and through this, have managed to establish good and favourable relationships with their local governments from village to district levels. Furthermore, they even found themselves better able to collaborate with other development organizations such as MVIWATA and INADES-FTz.

In other areas, farmers groups have formed societies. Some networks have set-up village banks e.g. CAVI at Mkoka, Dodoma. PELUM-Tz, in collaboration with UMADEP and MVIWATA, has facilitated the same establishment in Mgeta, Mkuyuni and Kinole in Morogoro. This has led to more recognition of farmer organizations by government and financial institutions e.g. CRDB.

Values such as commitment to farmers' empowerment; voluntarism and efficiency; self-reliance and team worke; gender sensitivity; creative and responsive to changes and challenges; participatory action-learning and self-criticism, are all central towards effective farmers' empowerment.

[5] Text in section is based on Mtoni and Bakewell-Stone 2002.

4.6 HIMA: "HIFADHI YA MAZINGIRA"

HIMA espoused a demand driven extension service following a general philosophy of HIMA project design which contends that 11 local communities gradually take on an increasing responsibility for the sustainable utilization of the natural resources within their area". HIMA's sectoral strategy was to utilize participatory approaches at the village level to develop sustainable programs, while ensuring that farmers and other stakeholders are involved in many aspects of the project cycle.

Considerations for private extension service

- Services must be demand-driven and not supply driven.
- Services must result in incremental increase in production.
- Markets must be available.
- Inputs must be available and supported by credit.
- Strengthen the research-extension-farmer linkage.
- Ensure appropriate pricing policies are in place.
- Effective communication and transport systems.
- Large number of extension providers to create competition and provide choices for farmers.
- Privatization of extension must not imply a complete disengagement with government services.

Para-Professionals

Support for and use of para-professionals was found to have a multiplier effect and farmers were very keen to learn from fellow farmers.

A new village committee, known as the village Mazingira committee, was created by HIMA, as the institutional set-up of demand-driven extension services. Through the Mazingira committee farmers would seek assistance from appropriate para-professionals.

Payment of para-professionals was made in-kind or cash and this was possible because technologies promoted were compatible with farmers' farming systems and profitable. Para-professionals provided venues for demonstration and actual training sessions. A village fund paid for by HIMA was created in support for demand-driven services.

4.7 FAMESA: EXPERIENCES FROM A REGIONAL PROGRAMME

Farm-level Applied Research Methods in Eastern and Southern Africa (FARMESA) was a regional collaborative initiative of Kenya, Uganda, Tanzania, Zambia and Zimbabwe with a regional co-ordinating unit in Zimbabwe. Countries of Malawi and Mozambique were incorporated in the final stages. It aimed at improving food security, incomes and resource management of farming families in the region.

Immediate objectives were

- to develop and utilize improved field methodologies and technologies;
- to gather, document and disseminate relevant field experiences;
- to improve in-service training and formal education on innovative field methods and
- to support Collaborating institutions that apply new methodologies and improved technologies.

Participatory On-Farm Research

Farmesa empowered farmers, extension workers, researchers and policy makers from both government and non-governmental organizations to innovate, analyze constraints and formulate and implement possible solutions. The focus was on testing the effectiveness of Participatory on Farm Research (POFR) as a method for developing, adapting and disseminating improved technologies on crops and livestock production. Farmer Group approach was applied in all field activities. In addition the program facilitated the organization of farmers into Farmer Field Schools in order to test improved technologies on maize and on integrated pest Management

The following case studies are taken to illustrate some of the experiences gathered from program activities:

Farmer Field School approach in technology development for maize production in Kongwa and Kilosa districts

The Farmer Field School (FFS) training programme was conducted in Ihanda village from July 1999 until June 2001 within the Gairo/Mlali field site. The site was selected for the implementation of the FARMESA Project activities as a representative of low agricultural production potential areas in the country. The FFS was introduced in the site in order to address the low adoption of crop and livestock technologies and enhance capacity building of the farming households by providing additional knowledge and management skills in a

participatory manner. Initially, a total of 15 crop-livestock farmers participated in the FFS training programme. However, the number increased up to 31 farmers as more farmers were impressed and joined them. Before commencing the FFS, the research team developed teaching manuals based on the needs of the targeted farmers which emerged during a community meeting. Major topics that were suggested by farmers include land preparation using oxen, use of farmyard manure, row planting, ox weeding, seed selection and storage with reference to maize crop. All learning activities took place in the field plots during land preparation, planting and the growing cycle of the maize crop. All learning was based on the farmers' observations in the field plots. Results from a comparative study showed that maize yields from FFS plots were higher than those from traditional practices. The combination of analytical methods, ecological insights and integrated management principles of growing a maize crop provided farmers with wider knowledge, thereby improving skills in production practices of the commodity.

Farmer Field Schools for "IPM" on bean production in Mbeya district

The Farmer Field School (FFS) approach was tested as a methodology in development, dissemination and utilization of improved technologies on bean production and pest control among small holder farmers in Isangati field site in Mbeya district. Two villages, Isuto and Mbawi, were selected for this purpose. The introduction of the FFS concept created enthusiasm among farmers and interested farmer groups with more than 20 members were formed. The farmer groups selected the treatments during a planning meeting and established experimental plots. The study showed that the FFS approach was participatory with a bottom up approach, emphasising collaboration between researchers, extensionists and farmers. Training and planning meetings encouraged farmers to build up a spirit of learning, records keeping and simple experimentation. The farmers group at Mbawi village decided to investigate the effect of fertilizers on bean production at various planting dates because they had never used fertilizers in crop production before. Monitoring and evaluation, as a core activity, empowered farmers in decision-making process. Farmers selected Uyole 96 at Isuto and Kabanima at Mbawi villages as the best bean varieties for further seed multiplication while mid and end of March were selected as best times for planting the beans at Isuto and Mbawi, respectively, based on the field observations made during agro-ecosystem analysis. The diffusion rate of new technology information in a community where the FFS approach was used was noted to be high. However, participation of both female farmers and policy makers in FFS was noted to be low. Launching seminars and workshops on FFS to policy makers and initiating FFS for women's groups could improve the situation. Use of the FFS approach in Tanzania and in other parts of the region is higly relevant and has high chances of being adopted in the region characterised by low ratio of extension staff to farmers, insufficient

funds to support extension service, and lack of farmer participation in technology development and where most smallholder farmers live in rural areas where the use of mass media is limited.

The use of Farmer Groups and "PRA" methods for on-farm evaluations of improved coffee varieties in Mbeya district

Results of a PRA study showed that coffee was a priority one crop in Isangati, especially in Isuto and Iwiji wards. The low yields of the crop in the division could partly be attributed to diseases such as coffee berry disease and coffee leaf rust. The mainly smallholder farmers in the division considered use of the recommended fungicides for the control of the two diseases too costly. Use of coffee varieties that were resistant to the diseases was considered a more cost effective option that could lead to increased yields and hence income for both male and female farmers in the area.

Use of Farmer Groups (FG) for running the on-farm trials was considered a more appropriate method in order for the new technology to reach a wider audience in a short time.

A total of 239 male and 74 female farmers participated in the introductory phase of the project. A total of 184 farmers, of which 138 were male and 46 females formed FGs around 15 trial sites in 8 villages. Only two of the 15 groups were headed by females.

Nine varieties that were resistant to CBD and CLR were introduced in the area for on-farm verification. Preliminary assessment by the FGs showed that the two diseases did not attack the new varieties. As coffee was reported as a priority crop in the area as a source of income, it was felt that improvement in the yields obtained by the farmers would increase their incomes and in turn boost their food security. Since diseases were seen as contributing to the current low yields and the farmers were not able to afford the recommended fungicides for the control of the two diseases, introducing varieties that were not attacked by the diseases was an ideal solution. It was anticipated that the reduction or complete stoppage in use of pesticides would lead to an unpolluted environment. This would benefit the population of both male and female farmers in the area, especially the youth and children who were likely to live longer.

To enhance FG activity more frequent and regular meetings between researchers, VEOs and the FRG members were planned. A calendar of research activities and training meetings was then prepared.

Shyness to contribute during meetings was noted among the FG members. This posed a serious obstacle to the dissemination of information on new technologies. The members of the FGs needed to be encouraged to present to others what they observed from the trials. This was done during subsequent planning meetings.

Experience of the first year of testing showed that the FGs method for technology development and transfer held some potential for success. For it to succeed, however, more frequent and regular contacts between researchers, VEOs and the FRG members were deemed necessary.

In virtually all FGs the female members were out-numbered by their male counterparts. Of the 15 FGs, female leaders headed only 2. The reasons for this imbalance were not immediately clear. This called for a gender analysis of coffee production for the villages in which this project operated. In addition to understanding the reasons for the gender imbalance, such a study could suggest ways for correcting the imbalance.

The problems cited by most FGs included death of some trees and infestation by green scales. The latter required some training as most farmers perceived it as a priority issue. Insecticides were recommended for the control of the pest.

4.8 THE SOUTHERN HIGHLANDS DAIRY DEVELOPMENT PROJECT (SHDDP)

From Dairy Development to Community Development

The Southern Highlands Dairy Development Project (SHDDP) is a co-funded project between the Governments of Switzerland and the United Republic of Tanzania. It has undergone a unique experience of working for about twenty years with dairy farmers with their organisations in Iringa and Mbeya regions. The project has realized various experiences during its course of operation from "Dairy Development to community Development"

Before dairy farmer group line was in place, farmers were first encouraged to adopt dairy techniques and technologies delivered by the project field staff. Both farmers and field staff also experienced different problems and weaknesses including; Lack of transparency on financial matters, lack of group by-laws, gender inequality, project staff were held full responsible in decision over farmers, farmers and other stakeholders were not involved in project planning, monitoring, assessment/evaluation etc. Formulation of a dairy farmer group

strategy reorganised the project's mode ode of operation to involve more stakeholders and empowerment of the farmers.

For some time, the project even sought the support of farmer motivators who provided training and advisory services to their fellow farmers. Afterwards farmer organisations were promoted in order to strengthen the results achieved at individual household level.

Dairy Farmer Organisations (DFOs)

Subsequently, a number of Community Based Organisations (CBOs) so called Dairy Farmer organisations (DFOs) came up in the project area. Within these CBOs some members received special training to work as animal health workers, dairy technologists, bookkeepers, group leaders, facilitators etc. Especially in the field of animal health, the project managed to set up an entire cadre of Community Based Animal Health Workers (CBAHW) who can be seen today as Para-professionals. Training support to farmers was basically provided on demand driven and cost sharing policy as per farmers felt needs and commitments.

The linking and organising of dairy farmer groups into networks became a common feature through which lobbying and advocacy meant a shortcut to influence directly their particular expected favour or benefits. However, results from lobbying are not always immediately visible and therefore not everybody is prepared to pay for lobbying activity leading into difficulties to execute their objectives and to finance their activities. A positive point to be mention is that many networks are open to new members to even those not supported by SHDDP. Some networks somehow transform themselves from a pure Dairy farmer group network into a farmers association.

Self Assessment Facilitation (SAF) and Participatory Impact Monitoring (PIM)

Farmers through their farmer organisations (Dairy farmer groups and Networks) were capacitated in both technical and organisational knowledge and skills. Various participatory approaches, methods, processes and tools thereof were employed such as; Participatory Technology development (PTD); Self Assessment Facilitation (SAF), Participatory Impact Monitoring (PIM), Farmer Exchange Visits etc..

Self Assessment Facilitation however, was realised to be the most appropriate methodology in organization and empowerment of the farmer organizations. This is a participatory technique and process of getting together group members to reflect critically on own project programme, project objectives and management of their group. Self-assessment facilitation is a member-centered approach expressing the values and experiential learning process. It is a

facilitation process aiming towards project and/or organisational management cycle (i.e. Planning – Implementation – Monitoring – Assessment – etc…)

Strengthening of DFGs and capacity building among members as taken up by the project aimed at both providing training on more technical topics as well as promoting group internal functioning and relations. SAF was developed as a methodology for groups to identify objectives and then in particular to formulate their needs and requirements to meet the objectives set. On the other hand, Participatory Impact Monitoring (PIM) was complementing SAF to enables a group to look at its progress and development.

From the above SHDDP very brief experiences it is apparent that participatory capacity building approaches enhances empowerment of smallholder farmers through farmers' organisations towards poverty reduction.

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