

Concepts and practices in agricultural extension in developing countries: A source book

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Foreword

Agriculture has once again been identified as the lead sector for growth which will help meet the Millenium Development Goals. It is being advocated that it should get a more prominent place in the world's development agenda. Even though rapid strides have been made in the last few decades in agricultural development, hunger still exists and rural populations are amongst the poorest. Africa, particularly, sub-Saharan Africa has not kept pace with the developments.

The agricultural sector in developing countries is facing rapid changes and unprecedented challenges. The knowledge intensive nature of the sector is more evident now than ever before. The trends of urban markets, globalization, changing consumption patterns, land and water constraints, climate change, need for alternative sources of energy including biofuels, and emerging diseases are driving development in agriculture. Private sector is increasingly playing a role, as also the civil society. Innovation is the order of the day.

Extension worldwide has been transforming in response to various challenges and developments. There is no gainsaying the crucial role of agricultural extension services in promoting agricultural innovation processes. They can play the boundary spanning role and help link farmers to various technical and non-technical services and markets. They are the major conduits for knowledge sharing.

There is a large amount of literature that has been and is being generated in this field of inquiry. This source book, a joint effort of ILRI and IFPRI/ISNAR, compiles available and recent literature on developments in the agricultural extension approaches and practice, mainly focusing on developing countries. This will help both practitioners and students of extension to access knowledge regarding various changes in various parts of the world and help learning from these experiences.

I congratulate the authors for their dedicated efforts in bringing out this volume and contributors whose work shaped this piece. We have no doubt it will be of immense use to policy analysts, policymakers, and the research and development community at large.

Carlos Seré

Aberra Deressa

Preface

This source book is a product of joint activity between ILRI–IPMS project, CaSt and IFPRI–ISNAR. It was developed to address the felt needs of practitioners, students and researchers in the area of agricultural extension to have a compilation of available literature on developments in concepts and practice of agricultural extension in developing countries.

Agricultural sector in the developing world is changing rapidly and is driven by a number of external and global factors. The challenges the sector is facing are ever increasing and becoming more complex. Consequently, the demands placed on extension services which have a crucial role to play in promoting agricultural innovation to keep pace with the changing context and improve livelihoods of the dependent poor, have also increased manifold. A number of innovative approaches and methods have been tried in various developing country contexts in agricultural extension, to transform the system and to capacitate them to respond to the demands and challenges. This source book brings together these various experiences and developments in thinking, to facilitate learning and use by practitioners and students.

The first chapter outlines the emerging challenges faced by agricultural R&D sectors and how paradigms are evolving in response to these changes and challenges. The second chapter traces the evolution of agricultural extension thinking and practice. It highlights some generic problems faced at various stages of evolution and approaches to address them. It highlights the factors identified in literature as contributing to successful knowledge dissemination processes and creating higher access to clients to the services. While reflecting on the challenges and opportunities, the chapter also explores the possible future of extension services in developing countries.

The third chapter gives an account of the various extension models, approaches and methods that have been tried out in developing countries and the experiences. The chapter concludes with the transition being made to agricultural innovation systems from Research & Extension systems and highlights the role of extension services in this context. Chapter four highlights the importance of farmer groups in providing effective extension services and promoting innovation. It explains in detail the processes, approaches and methods involved in group formation and development, management, performance assessment and, monitoring and evaluation.

Chapter five lists and describes in detail the various tools and methods used in participatory research and development processes. Chapter six focuses on the very important issues of Monitoring and Evaluation as systems for learning and for facilitating reflective action cycles. The importance of participatory approaches in M&E, process monitoring and outcome mapping are highlighted.

This book can be used by students and practitioners of extension, researchers and decision-makers. This is a collation of knowledge regarding the practice of extension and is not intended to be used as a recipe or blue print. Based on the context and the requirement, the approaches and tools should be selected, adapted and used. There is a built-in flexibility that would allow the user to employ his/her experience, creativity and imagination in adapting and using the approaches and tools described in this source book.

The authors encourage the readers to provide feedback and constructive comments for further development of this source book. Your inputs are very much appreciated.

Authors

1 Agricultural research and development (R&D) systems: Challenges and changing paradigms

1.1 Introduction

1.2 The reform agenda and emerging challenges

1.3 Paradigm shifts in agricultural R&D

1.1 Introduction

In a rapidly changing world, food and agricultural innovation systems in developing countries are facing new and increasingly complex challenges. Fighting poverty, ensuring food and nutrition security while protecting the environment still remains a major challenge facing global development practitioners today. New mechanisms to foster development and diffusion of innovation are needed to strengthen the ways in which information, knowledge and technology are developed and disseminated to ensure that the global changes benefit smallholder farmers, food insecure households and other vulnerable groups.

The scientific methods of experimentation and discovery have not changed since the 19th century, nor will they change. However, the environment in which discovery and innovation occurs changes constantly and this influences the organization and social process of innovation. The Research and Development (R&D) community responds to the changing needs and emerging challenges by developing innovative tools and approaches. Since the introduction of technology transfer model, the R&D arena in the developing world has seen a number of paradigm shifts. In this chapter an attempt is made to briefly describe these concepts so that the R&D practitioners can comprehensively internalize the desirable features of these concepts in designing the future policies strategies and programs.

Over the years the R&D system has been testing, adopting and adapting a number of concepts and procedures to make it relevant, effective and efficient. Some of these concepts include: Farming Systems Approach; Participatory Research Methods; National Agricultural Research Institutes (NARIs); National Systems Framework (NSF) including National Agricultural Research Systems (NARS), National Agricultural Extension System (NAES) and National Agricultural Education and Training System (NAETS); Agricultural Knowledge and Information Systems (AKIS); Agricultural Innovation Systems (AIS); Rural Livelihoods; Agri-Food Chain/value chain; Knowledge Quadrangle; Action Research; Agricultural Research for Development (ARD); Doubly green revolution and Rainbow revolution; and Positive Deviance. These concepts are briefly discussed in this chapter to understand the contemporary perspectives and their evolution with respect to agricultural R&D systems.

1.2 The reform agenda and emerging challenges

The policy and institutional context in which agricultural research and innovation occurs has changed dramatically. Rapid changes continue to take place in the structure and authority of governments, the global economy, the structure of the farming sector and in the global and local food industries and retail businesses. The institutional landscape is also changing dramatically. The 'third parties' (such as

civil society, farmer organizations and NGOs) are increasingly playing an important role in agricultural R&D. Cross sectoral linkages between agriculture and other sectors (such as water, health, energy and education) are becoming increasingly important. The agricultural sector is expected to play a significant role in poverty alleviation and food and nutrition security, while protecting the environment. Research and support services are now inextricably linked to the broader development questions. With reduced funding support, the agricultural R&D system is now forced to face questions on its continuing relevance, approaches, accountability and impact.

Since independence from colonial powers, most developing country research and extension managers have been forced to grapple simultaneously with five complex transitions which ultimately will influence the productivity and sustainability of the R&D system. These are:

- Managerial transition—from colonial to local research and extension administrators;
- Scientific transition—from expatriate to national scientists;
- Financial transition—from dependence on financial support from colonial governments and large-scale farmers to mobilizing support from national governments, donors and beneficiaries;
- Political transition—from commercial farms to smallholders to private research and extension; and
- New forms of public–private–civil society research–extension partnerships.

At present the three core institutions in the agricultural knowledge triangle—research, extension and higher education—have been downsized and restructured and new private institutions are now in stiff competition with their public counterparts.

In most developing countries, the public sector agricultural R&D system has been characterized by build up of research personnel, declining levels of operating resources per researchers and growing reliance on donor funds. Today most NARIs are constrained by recruitment freezes or lack of finance to hire new staff or retain existing staff (inadequate support, low pay); budgets highly committed to staff salaries and benefits, i.e. existing establishment costs; budgetary constraints that focus on short-term activities, geographical areas and limited number of commodities; and lack of strong national or rural development policies in favour of resource-poor smallholders and sustainability.

Recent studies (Biggs and Smith 1998; Hall and Nahdy 1999; Ashby et al. 2000; Chema et al. 2003) show that many organizations, especially publicly funded agencies dealing with agricultural R&D in developing countries are facing a crisis of confidence among key stakeholders due to:

- lack of strategic planning that indicates future directions
- inward looking attitudes
- poor participation and cooperation of end-users in research activities
- inadequate monitoring and evaluation systems
- top-heavy, bureaucratic procedures
- insufficient resources for effective implementation of priority research
- lack of effective external linkages and
- lack of evaluation and performance culture.

This crisis has been found to result in organizational inefficiencies, lack of adequate stakeholder participation and responsiveness, decreasing investor confidence, inadequate staff motivation and morale, limited research and service outputs, limited uptake and utilization of research findings and a ‘brain-drain’ from the public sector.

The reform agenda within the R&D arena includes: redefinition of the role of government in agricultural

R&D, decentralization/privatization of agricultural R&D activities, broader and active stakeholder participation-pluralism in service provision, networks and partnerships and new funding arrangements. The new funding arrangements include: separation of financing from service provision and research execution and changing the funding base to competitive funding. Orientation of R&D to be more outward looking, client oriented and impact driven and embracing of 'systems' perspectives are also part of the reform agenda in the R&D arena. Some of the exogenous trends contributing to the reform process are changes in the political, socioeconomic, market and institutional context together with changes in the demand for R&D services, research technologies, methodologies and approaches. Managing this complex environment requires a range of skills and tactical planning, and shift in paradigms.

Recent developments in the context of agricultural R&D present certain challenges to agricultural research and innovation in developing countries. These developments include:

- Confronting new priorities in a rapidly changing world (e.g. stronger demand for competitive and quality-conscious agriculture) and adapting to changes within a more complex innovation systems framework where there are a greater number of actors and linkages to consider;
- Redefining the role of government in agricultural research and service provision and defining the role of the private sector, civil society and end users;
- Strengthening the demand side of agricultural research and services to ensure that these programs are more responsive and accountable to end users;
- Developing a clear understanding of the institutional structures needed at the national, regional and subregional levels for agricultural research and service provision and of whether, and how, this understanding would imply changes in the current structures present at national, regional and global levels;
- Developing a clear understanding of the institutional structures needed at every level for agricultural education within the emerging food and agricultural innovation systems;
- Ensuring stakeholder participation and developing local, regional and global partnerships and alliances;
- Facilitating development of innovative funding instruments that make public institutions more sustainable, reduce donor dependence, and enhance co-financing by end users and others
- Assisting in developing mechanisms through which internal and external support for food and agricultural innovation systems in developing countries are better coordinated;
- Strengthening system linkages and coordination, including linkages between agricultural research policy and wider policies for science and technology (IFPRI 2005).

1.3 Paradigm shifts in agricultural R&D

Agricultural Research and Technology Development is undergoing a paradigm shift, in which the environment under which agricultural research and extension systems are operating is affecting their organizational structure, management style and field operations. Basic trends of these environmental changes are based on multiple partnerships, multilevel participation and the enlargement of the scene from national to supra-national levels. Under these circumstances, both agricultural research and agricultural extension policies are going obsolete with regard to new options (SDR 2005).

A shift was needed from a single commodity, monodisciplinary base to a farming system and a multidisciplinary based approach together with a change from a top-down extension model to a participatory approach to technology assessment and adoption. The key features of the paradigm shift are summarized in Table 1.1.

Table 1.1. *Key features of paradigm shifts in R&D*

Characteristics	Conventional paradigm for agricultural R&D	Current paradigm for agricultural R&D
Driving motive	<ul style="list-style-type: none"> • Efficiency: maximize productivity and profit/return to limited resources; competitiveness 	<ul style="list-style-type: none"> • Productivity, achieving food and nutritional security, poverty alleviation, ecological sustainability and equity
Assumed causes of problems	<ul style="list-style-type: none"> • Lack of knowledge • Farmers are irrational 	<ul style="list-style-type: none"> • Political-economic roots of problems, neglect of ecology and farmers' needs (and knowledge), poor understanding of production systems
Assumption and key features	<ul style="list-style-type: none"> • Crop/commodity specific monoculture, uniformity/homogeneity, reductionism, simplification of system, efficiency focus on limited variable (land, labour, capital) 	<ul style="list-style-type: none"> • Agro-ecosystems, polycultures, multiple and high value crops and resources in system, diversity/heterogeneity, holistic view of productivity and resource management
Institutional relations and actors	<ul style="list-style-type: none"> • Top-down (linear) technology development and transfer model • Research to extension (or private sector) to farmers 	<ul style="list-style-type: none"> • Interactive systemic model, collaboration and networks, horizontal relations (farmer to farmer); agricultural innovation systems, pluralism (research, extension, NGOs, education, civil societies, CBOs, private sectors)
Main beneficiaries and locus of control of technology	<ul style="list-style-type: none"> • Private sector, formal institutions 	<ul style="list-style-type: none"> • Public interests, communities and farmers (especially the poor), women and children, vulnerable groups
Focus of innovation	<ul style="list-style-type: none"> • Single technologies (seeds, agro chemical, bio-technology) • Production technologies 	<ul style="list-style-type: none"> • Agro ecological principles, institutional innovations, ITK, empowerment and capacity strengthening, relationship among partners and actors • Both production and R&D technologies
Main types of research	<ul style="list-style-type: none"> • Unidisciplinary, reductionist, scientists or private sector generate knowledge, mainly done in laboratories and research stations 	<ul style="list-style-type: none"> • Multidisciplinary, farmers are researchers and innovators, on-farm, participatory, in communities
Common view of farmers	<ul style="list-style-type: none"> • Passive audience/partners, irrational seen as conservative and ignorant 	<ul style="list-style-type: none"> • Active, rational, key partners in the innovation process with valuable knowledge • Farmers are active in adopting new research findings to improve productivity
Skills required	<ul style="list-style-type: none"> • Specialization in technology, biological/agronomic sciences, business/finances, bio technology 	<ul style="list-style-type: none"> • Biological systems management, social and institutional relations, people/partnering skills, facilitating skills.
Policy arena	<ul style="list-style-type: none"> • Political agencies form rules, close connection with private sectors 	<ul style="list-style-type: none"> • Public (community) actively involved in setting agenda and decisions • Link to environmental/social/food interests

Given the sweeping reforms that are taking place, the R&D systems are facing a transition period in which they will need to restructure themselves, confront new demands, and adjust to new political, scientific, institutional and economic environments. Some of the key emerging concepts and perspectives within the agricultural R&D system are discussed in the following sections.

1.3.1 Farming systems perspective

A farming system is defined as a population of individual farm systems that have broadly similar resource bases, enterprise patterns, household livelihoods and constraints, and for which similar development strategies and interventions would be appropriate. Depending on the scale of analysis, a farming system can encompass a few dozen or many millions of households. Farming Systems Approach is an approach to the study of farm problems in which the farm; other household activities and wider units such as communities and villages are seen as interdependent systems. The problems of the farm/farmer cannot be understood or solved by looking at single elements alone. It deals with a sequential, farmer participatory approach to generate, evaluate and disseminate agricultural technology.

The concept Farming Systems Perspective (FSP) implies seeing things from the farmers' view-point. It means that researchers should use an FSP even when working on a single commodity and/or disciplinary problem. FSP means that researchers should be sensitive to farming systems interactions, understand how farming systems operate, and use this understanding in designing and evaluating the new technologies offered to them. The concept has grown from farm boundaries to household systems.

Since small farmers are managing the farm household with multiple objectives and multiple enterprises, but with limited resources, the interaction between the various components is very critical in decision-making. Interactions may occur between the various components crop–crop, crop–livestock, farm–household as well as on-farm–off-farm activities as they compete for the same resources. Interactions may also arise from farmers' objectives and his/her attitude towards risk. In addition, these interactions may occur over space (e.g. inter-cropping), over time (e.g. liming, green manuring), and may be both spatial and temporal (e.g. relay cropping).

The interactions are important to identify the trade-offs and compromises in the system while identifying and prioritizing problems in order to understand the process of resource allocation. They are important in identifying the indirect costs and benefits during technology assessment. The research may concentrate on key enterprises while taking into account the interactions with other elements, including resource competition, complementarity and participatory processes, together with meeting the multiple objectives of the farm household. The explicit recognition of the importance of interactions in the farming system is defined as the 'farming systems perspective'.

1.3.2 Participatory research methods¹

The new paradigm is based on the premise that the non-adoption of technologies is not due to ignorance of the farmers but due to deficiencies in the technology and the process that generated it, especially inadequate participation in all stages of the process by those intended to benefit. In this new paradigm,

1. Participatory research and extension methods and tools are discussed in detail in Chapter 5 of this source book.

farmers analyse, choose, experiment and evaluate, while outsiders convene, catalyse, advise, search, supply and provide support and consultancy.²

Today participation has become a widely accepted strategy for conducting R&D projects, yet it is understood in many different ways. Some people define participation as any 'voluntary or other forms of contributions by rural people to pre-determined programs or project'. Activities such as participation in a survey, serving as key informant, or participation in an experiment which is researcher-managed could be described as participation. On the other hand, participation can be considered as a product (end) as well as a process (means). As a product, the act of participation is an objective in itself, and is one of the indicators of success as it refers to the empowerment of individuals and communities in terms of acquiring skills, knowledge and experience, leading to greater self-reliance. However, when viewed as a process, participation refers to the action used to achieve a stated objective, i.e. cooperation and collaboration which helps to ensure sustainability of program/project/development.

In the literature, a distinction is made between 'participation' and 'participatory'. The term participatory development has sometimes been defined as involving users and communities in all stages of the development process (Narayan 1993). On the one hand, participation has been defined by one author as 'voluntary or other forms of contributions by rural people to pre-determined programs or project' (Oakley 1991, p 8). On the other hand, a participatory project has been described as one initiated and 'owned' by beneficiaries (Cummings 1995). Thus, participatory programs contribute to empowerment of the individuals and communities involved in the program. Participation can be a product as well as a process. As a product, the act of participation is an objective in itself, and is one of the indicators of success. On the other hand, participation is viewed as a process when the act of participation is used to achieve a stated objective, such as improving a family's knowledge on child nutrition. In practice, therefore, there is little to be gained from such distinctions between participation and participatory in practical fieldwork.

The popularity of participatory approaches is based on the assumption that they eliminate the weaknesses of the traditional 'top down' approach to research and development. Participatory approaches value the input of the beneficiary and are associated with increasing the respect for and incorporation of indigenous knowledge in all aspects of a program or project.

Many different types of participation exist, and can be classified according to the degree of initiative and involvement of beneficiaries. These include:

- functional participation—to get something useful accomplished
- empowering participation—to give a community a greater decision-making role
- capacity building participation—to enhance the skills of the community
- contractual participation—to provide specific services
- consultative participation—to get information
- collaborative participation—work as partners
- collegial participation—to strengthen farmer research
- passive participation—where most decisions are made by outsiders; mostly one way communication between outsiders and local people
- active participation—where there is two way communication; people get an opportunity to interact with outsiders

2. For a detailed discussion of the major differences between the traditional approach and the participatory approaches to technology development and transfer, see Anandajayasekaram (1996).

- participation by subscription—where the local people are given an opportunity to subscribe to the project and in turn receive some benefits from the project
- participation based on local request—demand driven approach where planned activities respond to the needs expressed by local people
- unfolded—indigenous process initiated and controlled by local communities
- facilitated—intervention by outside agents, to liberate and empower
- induced—influenced by outside agents to manipulate for external purposes
- co-opted—coercion by outside agents; behaviour modified by fear or propaganda.

In development projects, the evidence to date would suggest that in broad terms people's participation develops along a continuum. It invariably begins with *passive participation* where beneficiaries basically welcome the project proposals and support them, but are generally cautious in relation to project management. This will result in *increasing involvement* where beneficiaries begin to develop more trust in the project and more contact with its activities and staff; they may also begin to take on some responsibilities. The next step is the *active participation* where beneficiaries play the role of active partners in the project's implementation and development and assume increasing responsibility. The final stage is *ownership/empowerment* where, beneficiaries are both willing and able to sustain and further develop the initiatives begun by the project.

Although there are different types of participation as illustrated above, it is generally agreed that participatory approaches to research and development compared to 'top down' approaches, value the input of the end users and are associated with increasing the respect for and incorporation of indigenous knowledge in all aspects of a program or project. There are therefore a large number of benefits derived as a result of beneficiaries' participation.

Evolution of participatory approaches

The systems oriented participatory approaches to technology development and dissemination emerged as a result of the realization that the Transfer of Technology (ToT) paradigm of industrial and Green Revolution agriculture had not worked well within the complex, diverse and risk-prone agriculture prevalent in the semi-arid, subhumid and humid tropics. Historically, non-adoption of recommendations was attributed to farmers' ignorance, to be overcome through more and better extension, and then to farm level constraints, with the solution in easing the constraints (Chambers 1993). The reasons for non-adoption of technologies are well documented (Byerlee and Collinson 1980; Norman et al. 1994; Anandajayasekeram 1996; Matata et al. 2001). However, evidence shows that farmers are far more knowledgeable and better informed than agricultural professionals used to suppose; and farming conditions are, and will remain, different from those prevailing at research stations.

The salient feature of the new approach is the reversal of learning, where researcher and extension workers are learning from farmers. The key elements of the new paradigm are to put emphasis on people rather than 'things', to decentralize, empower the participants, to value and work on what matters to participants (subjective perspective), and to learn from the beneficiaries rather than to teach them. Location and roles are also reversed, with farms and farmers seen as central instead of research stations, laboratories and scientists. It has been argued (Chambers 1993) that much of the earlier farming systems work could be seen as an extension of ToT, where outside professionals obtained information from farmers, analysed it and decided what would be good for the farmers, and what experiments should be designed and executed. In contrast, in the new participatory approaches analysis, choice and

experimentations are conducted with and by farmers themselves, with outside professionals providing catalytic facilitating and support role. The major shifts in paradigm are summarized in Table 1.2.

Table 1.2. *Shift in paradigm in ToT*

Attributes	Prior to introduction of participatory approaches	Now
Mode	Blueprint, supply, push	Process, demand-driven
Keywords	Planning, transfer, farmers	Participation, empowerment, rural, community
Goals	Pre-set; closed	Evolving; open
Decision-making	Centralized	Decentralized
Methods, rules	Standardized; universal	Diverse; local
Analytical assumptions	Reductionist	Systems; holistic
Interaction of professionals with people	Instructing, motivating	Enabling, empowering, facilitating
Local people seen as:	Beneficiaries, passive	Partners, actors
Outputs	Uniform	Diverse: based on capabilities
Planning and action	Top-down	Bottom-up

Source: Adapted and modified from Chambers (1993) and van Laurens et al. (1997).

Farming Systems Approach (FSA) to technology development and dissemination is a category of research that features collaborative interdisciplinary work. This research approach addresses the specific needs of a particular target group of farmers and emphasizes on on-farm activities and farmer participation in all stages of the process. The various stages, objectives and activities of Farming Systems Approach – Technology Development and Dissemination (FSA–TDD) are presented in Table 1.3. In its development, farmer focus, systems perspective and technology generation have remained at the forefront while other themes have shifted in emphasis.

1.3.3 Action research

Action research is a research philosophy/approach that specifically focuses on ‘learning by doing’, where ideas and concepts are borrowed from other places and are tested and adapted to local circumstances. Action research, also known as participatory research, collaborative inquiry, emancipator research, action learning and contextual action research, is essentially a process by which reform practitioners attempt to study their problems systematically (scientifically) in order to guide, correct and evaluate their decisions and actions.

Several attributes separate action research from other types of research. First, it focuses on turning the people involved in the reform process into researchers on the principle that people learn best, and more willingly apply what they have learned, when they do it themselves. Second, action research is always connected to social action. It understands itself as a concrete and practical expression of the aspiration to change the social (economic, political etc.) world for the better through improving shared social practices, understanding of these social practices, and the shared situations in which these practices are carried out. It is always critical—it is about relentlessly trying to understand and improve the way things are in relation to how they could be better. It is also critical in the sense that it is catalytic: it aims at creating a form of collaborative learning by doing, in which groups of participants set out to learn from change in a process of making changes, studying the process and consequences of these changes, and trying again. It aims to help people understand themselves as the agents, as well

as the products, of history (Lewin 1958; Huizer 1979; Fernandez and Tandon 1981; Huizer 1983; Carr and Kemmis 1986; Sohng 1995).

Table 1.3. *Stages, objectives and activities of FSA.*

Steps/participants	Objectives	Activities	Concern
Diagnosis Farmer, Researcher, Extension staff, NGOs, Delivery agents	<ul style="list-style-type: none"> – To identify ‘tentative’ target groups – To describe and understand production systems: What? How? Why?, Who? and When? – To identify the priority enterprises in the system – To identify and prioritize problems and constraints – Problem analysis to establish causal factors and possible systems interactions – To identify potential solutions to the identified problems – To gather initial reactions to the proposed solutions/technical options from the target group of farmers 	<ul style="list-style-type: none"> – To identify the ‘tentative’ target group based on secondary data, site visits and key informant surveys – Collection, analysis and synthesis of available secondary information related to the target group – Generation of primary information using one or more of the available diagnosis tools 	<ul style="list-style-type: none"> – Appropriate methods – Focus (individual vs. group) – Farmer participation – Gender sensitivity – Policy and institutional constraints
Planning Researchers including commoity / disciplinary researchers, farmers appropriate extension staff, at times NGOs and policy planners	<ul style="list-style-type: none"> – To identify feasible solutions to identified priority problems – Plan diagnosis and experimental activities – To formulate annual work programs giving due consideration to available resources – Include both bio-physical and socioeconomic research 	<ul style="list-style-type: none"> – Identify potential solutions – Screening to identify feasible solutions – Identify list of activities – Work out the details of each activity (design, treatment etc.), including annual resource requirement – Develop annual work plan by matching activities with available resources 	<ul style="list-style-type: none"> – Farmer participation – Sustainability consideration

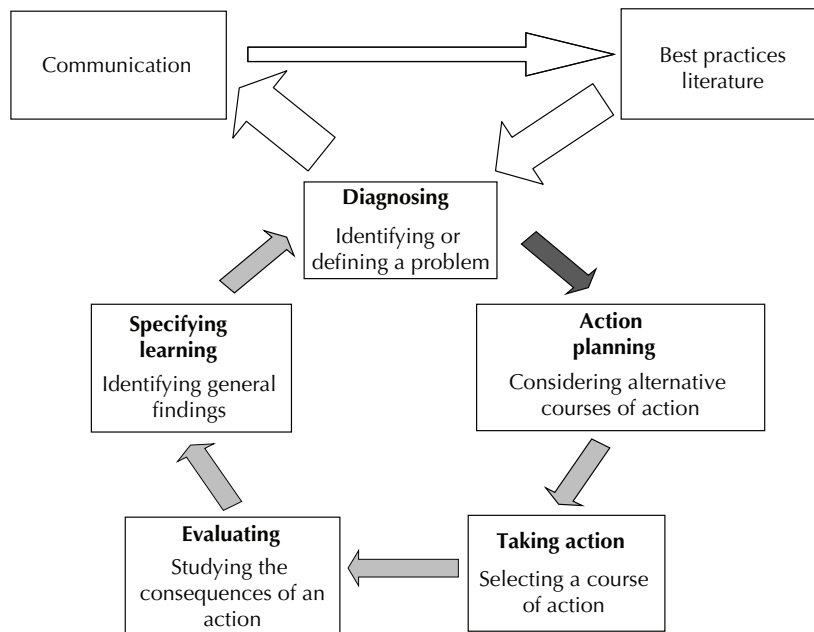
Steps/participants	Objectives	Activities	Concern
Experimentation/ implementation Research and extension staff, farmers, NGOs	<ul style="list-style-type: none"> - To implement the experiment in the most efficient manner keeping in mind the objectives of the experiment - To complete socioeconomic investigations 	<ul style="list-style-type: none"> - Planning of survey - Farmer selection - Site selection - Arrangement with farmers - Layout of the experiments - Treatment management - Monitoring and data collection - Informal evaluation (on-going) at the site 	<ul style="list-style-type: none"> - Farmer participation in management - Cost effectiveness - Farmer assessment
Evaluation Depending on the nature of the experiment researchers, extension staff, farmers and biometrician	<ul style="list-style-type: none"> - To assess the performance, in relation to objectives, relevancy and appropriateness for the target group 	<ul style="list-style-type: none"> - Review and circulation of reports - Scrutiny of the data - Data analysis <ul style="list-style-type: none"> - Statistical - Agronomic - Economic - Farmer assessment - Environmental implications 	<ul style="list-style-type: none"> - Farmer assessment - Wider adaptability - Sustainability considerations - Gender considerations - Socio-cultural impact - Feedback to policy makers
Re-planning Research and extension staff, NGOs	<ul style="list-style-type: none"> - To confirm original hypotheses regarding group, problem statement and priorities - To adjust the treatments to reflect new information generated 	<ul style="list-style-type: none"> - Same as for planning 	<ul style="list-style-type: none"> - Farmer participation
Recommendation and wider dissemination Research and extension staff, NGOs.	<ul style="list-style-type: none"> - To test the technology across population - Formulation of extension messages including monitoring and feedback - Scaling up 	<ul style="list-style-type: none"> - Demonstration - Field days - Workshops - Training of frontline extension staff - Developing messages, pamphlets, bulletins etc. 	<ul style="list-style-type: none"> - Impact - Feedback - Broader participation - Scaling up

Source: Anandajayasekeram (1996).

Action research takes place in real-world situations, and aims to solve real problems with researchers often acknowledging their bias—it challenges the concept of ‘objectivity’. It is committed to spreading involvement and participation in the research process. It not only offers ways in which people can improve their socioeconomic and political conditions through research on the ‘here and now’, but also in relation to wider socioeconomic and political structures and processes—as people whose

interconnections constitute the wider webs of interaction which structure social life in discourses, in work, and in the organizational and interpersonal relationships in which relations of power are exercised (Sohng 1995).

Action research typically involves an intervention methodology. As its eventual function is to bring about future change, in the short term, its key function is to involve those who are most affected by the expected change in a way that secures their commitment. Action research is typically cyclic. Carr and Kemmis (1986) conceive of each action research cycle as comprising planning, action, observation and reflection, whilst Susman (1983) distinguished five phases of action research as shown in Figure 1.1.



Adapted from Susman (1983).
Figure 1.1. Action Research Cycle.

Firstly, a problem is identified and data is collected for detailed diagnosis. This is followed by a collective postulation of several possible solutions, from which a single plan of action emerges and is implemented. At this point the best practices literature constitutes a useful input into this research cycle, by providing promising, alternative courses of action. Data on the results of the intervention are collected and analysed, and the findings are interpreted in light of how successful the action has been. At this point, the problem is reassessed and the process begins another cycle. This process continues until the problem is solved.

Action research is used in real situations, rather than in contrived, experimental studies, since its primary focus is on solving real problems. It can, however, be used by social scientists for preliminary or pilot research, especially when the situation is too ambiguous to frame a precise research question. Mostly, in accordance with its principles, it is chosen when circumstances require flexibility, the involvement of the people in the research, or change must take place quickly or holistically. It is often the case that those who apply this approach are practitioners who wish to improve understanding of their practice, social change activists trying to mount an action campaign, or, more likely, academics who have been invited into an organization (or other domain) by decision-makers aware of a problem requiring action research, but lacking the requisite methodological knowledge to deal with it.

Action research not only enables the delivery of the research objectives but also builds the necessary capacity to institutionalize learned approaches and methods. One of the criticisms of action research is that practitioners often get so involved in the action that they forget their research function. Another problem is that what is being learned through action research (i.e. the experience) is often not recorded—there is no tangible output. Moreover, when action-research practitioners write it down, few scientific journals are prepared to publish it because it is not up to ‘orthodox’ scientific standards. At the end of each study, action research will leave behind applicable knowledge among management practitioners and systematically documented lessons learned that are applicable in similar conditions elsewhere. Ultimately, as these case study results are systematically tested under similar and even dissimilar conditions, the cumulative results will form a wealth of knowledge.

1.3.4 National Agricultural Research Systems (NARS)

For a considerable period, R&D practitioners dealt with public sector agricultural research institutions (NARIs) as vehicles to promote agricultural development. NARIs framework had emerged to facilitate major investments in agricultural technology to increase food production and to promote export cash crop production. Due to its early success, this institutional framework dominated the scene for decades. However, the inadequacy of the NARIs concept in addressing agricultural research and development problems forced R&D practitioners to look for alternative frameworks that could accommodate all public institutions involved in agricultural research, extension and education. Hence, there grew the need to look at the various organizations undertaking agricultural research as a system and this gave birth to the National Systems Framework (NSF). The NSF included the National Agricultural Research Systems (NARS), the National Agricultural Extension System (NAES), and the National Agricultural Education and Training System (NAETS). This trend of thinking continued to include the other institutions involved in agricultural R&D and resulted in a number of other concepts such as Agricultural Knowledge and Information System (AKIS), the Technology Development and Transfer system (TDT) and the Agricultural Innovation Systems (AIS).

The NARS concept is a soft system concept for which no watertight definition exists despite it having been in existence for some 25 years. It is essentially a loose conglomerate of agencies or actors involved in conducting national agricultural research. Trying to define the NARS concept more precisely leads only to a whole series of rather arbitrary borderlines. In many African countries there is still a tendency to equate the NARS with the dominant national agricultural research organization or institute. The idea of a more pluralistic NARS is only gradually being accepted by key players in agricultural research.

1.3.5 Agricultural Knowledge and Information Systems (AKIS)

The AKIS concept is slightly less well known than the NARS concept, but has gained popularity in recent years. AKIS combines agricultural research, extension and education in one system (also known as the knowledge triangle) and focuses on how the three activities generate new knowledge and information for farmers. The emphasis in this model is very much on the linkages between the different components. While some would argue that it is an old concept already applied by the US land-grant universities in the later years of the 19th century, the linkage problem is still acute in most countries. Nagel (1979) was the first to describe the properties of an Agricultural Knowledge System (AKS) in detail. Rölting further developed and popularized the concept during the 1980s (Rölting 1986; Blum et al. 1990).

The basic premise of AKIS is that research and extension should not be seen as separate institutions which must somehow be linked; instead, scientists working on different types of research and extension

agents at all levels should be seen as participants in a single Agricultural Knowledge and Information System (AKIS). Rölíng (1986) defined AKIS 'as a set of agricultural organizations and/or persons, and the links and interactions between them, engaged in such processes as the generation, transformation, transmission, storage, retrieval, integration, diffusion and utilization of knowledge and information, with the purpose of working synergically to support decision-making, problem solving and innovation in a given country's agriculture'.

More recently, the FAO and the World Bank joined forces in promoting the AKIS concept with the publication of 'strategic vision and guiding principles' on the topic in 2000. This document defined AKIS thus:

[An AKIS] links people and institutions to promote mutual learning and generate, share and utilise agriculture-related technology, knowledge and information. The system integrates farmers, agricultural educators, researchers and extension personnel to harness knowledge and information from various sources for better farming and improved livelihoods.

FAO/World Bank (2000)

An AKIS can be defined in three different ways:

1. As sets of organizations and people engaged in knowledge and information processes;
2. As sets of coherent cognitions that have evolved among members of organizations, communities or societies; and
3. As computer-based 'intelligent' software (for example, expert systems, artificial intelligence).

When an AKIS is seen as a cognitive system, the components of the system are cognitions, that is, concepts, theories and beliefs about 'reality' that guide our behaviour (Rölíng 1986). The cognitive approach has been used to explore several aspects of reality as perceived by the farming family, including the classification of weeds and male/female users of cassava (Jiggins 1986).

The institutional approach looks at sets of interconnected actors, each engaged in different activities, such as research, technology transfer, production or consumption and each playing different but complementary roles, and hence functioning synergically, e.g. land grant universities and cooperative extension systems. The institutional approach leads to theory building about the way people and organizations receive, transform and transmit information, about the interfaces between them, and about the complementary roles institutions play in relation to each other. The purpose of the approach is to improve the management or design of the AKIS so as to make it function in ways deemed desirable by policy makers, farmers and other participants in the system. AKIS includes a number of basic knowledge processes such as generation, transformation, integration, storage and retrieval.

Knowledge generation appears to be more effective when carried out in groups than when attempted by individuals. Empirical studies have shown that the productivity of researchers is related to the extent to which they participate in networks. An important goal of the analysis, design and management of an AKIS is to increase the synergy of its components, i.e. the total impacts of an AKIS should be more than the sum of the impacts of its constituent parts. Hence, the essence of an AKIS is that the knowledge generated in one part of the system is turned into information for use in another part of the system.

The transformations taking place within an AKIS are as follows:

1. From information on local farming systems to research problems
2. From research problems to research findings

3. From research findings to tentative solutions to problems (technologies)
4. From technologies to prototype recommendations for testing in farmers' fields
5. From recommendations to observations of farmer behaviour (male, female, children)
6. From technical recommendations to information affecting service (inputs and marketing) behaviour
7. From adapted recommendations to information dissemination by extension
8. From extension information to farmer knowledge.

When modelling the AKIS, it is important to bear in mind that the system takes its place in a larger context, from which it is not separate (see Figure 1.2). Agricultural knowledge and information processes must be examined at a national level against the backdrop of: (1) the policy environment, which formulates the laws and incentives that influence agricultural performance; (2) structural conditions, such as markets, inputs, the resource base, infrastructure and the structure of farming; (3) the governance structure through which interest groups influence the system; and (4) the external sector, comprising donor agencies, international agricultural research centres (IARCs) and/or commercial firms (Elliott 1987).

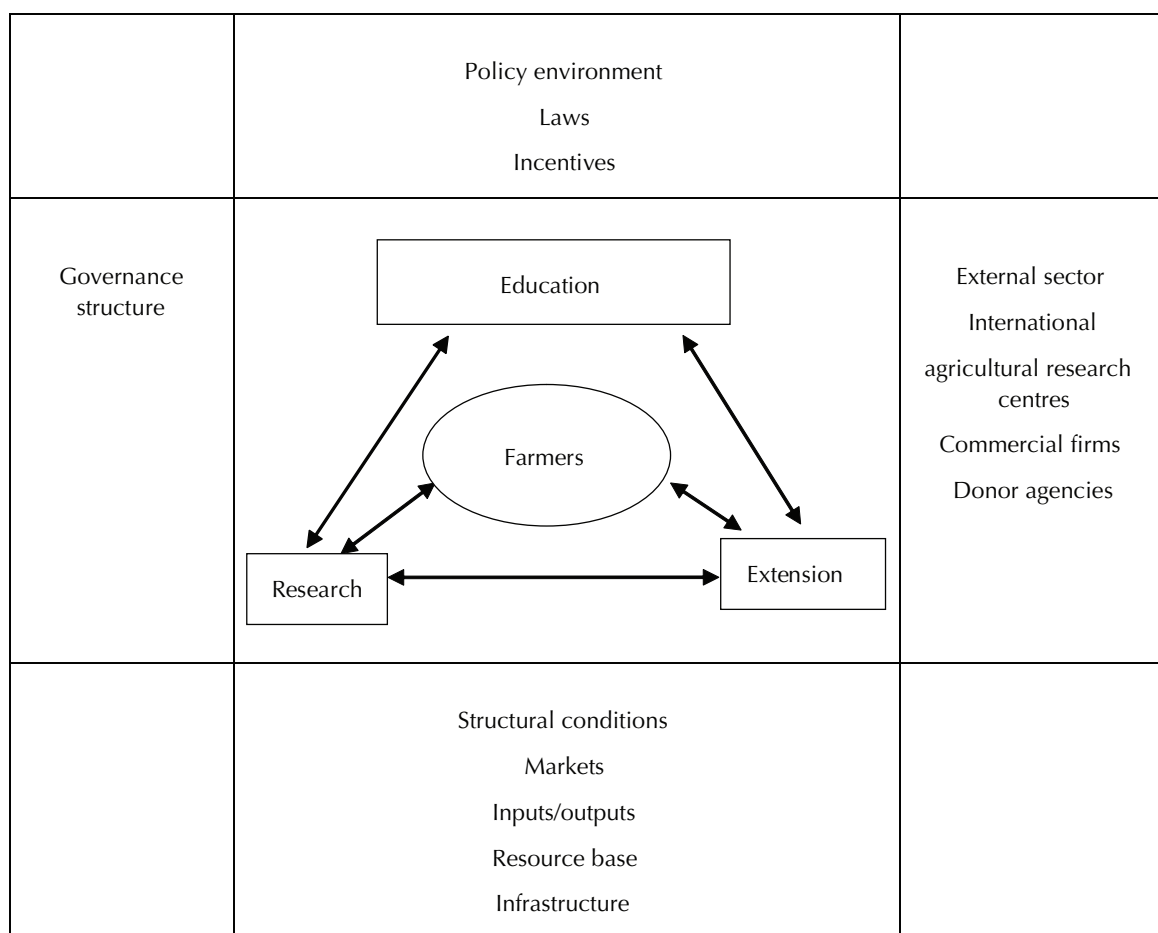


Figure 1.2. *The AKIS as part of a larger system.*

The policy environment plays a crucial role, so much so that in some AKIS models it is considered one of the components of the AKIS itself. Once again policy is considered as a prime mover outside the AKIS. Together with two prime movers inside the system, namely management and user control, policy is considered a force that can overcome the default conditions to which a system reverts unless pressures are applied to prevent it from doing so (Sims and Leonard 1989). Likewise, structural conditions play

an important role. Variability in the production environment and among the farmers who use it has tremendous implications for the design and management of the AKIS.

To sum up, an effective AKIS requires:

- The input of information from external sources: If the system does not have the capacity to generate and enhance appropriate roles for its constituent parts, it will not be in a position to absorb such information. In the agricultural sectors of developing countries, the lack of social organization among small-scale farmers is therefore a considerable barrier to development.
- Improving the linkage mechanism between various components: A linkage mechanism is the concrete procedure, regular event, arrangement, device or channel which bridges the gap between components of a system and allows communication between them. The linkage mechanism is the device which operationalizes the interface.
- A detailed understanding of the functions which are to be performed by the system: If agricultural development is to be enhanced, there is a need to nudge widely differing institutions, often under different administrative arrangements, both public and private, into compatible roles.

1.3.6 The Innovation Systems Perspective

The notion of innovation with regard to its definition, systems of innovation, innovation systems perspectives and the different national innovation systems are discussed in this section.

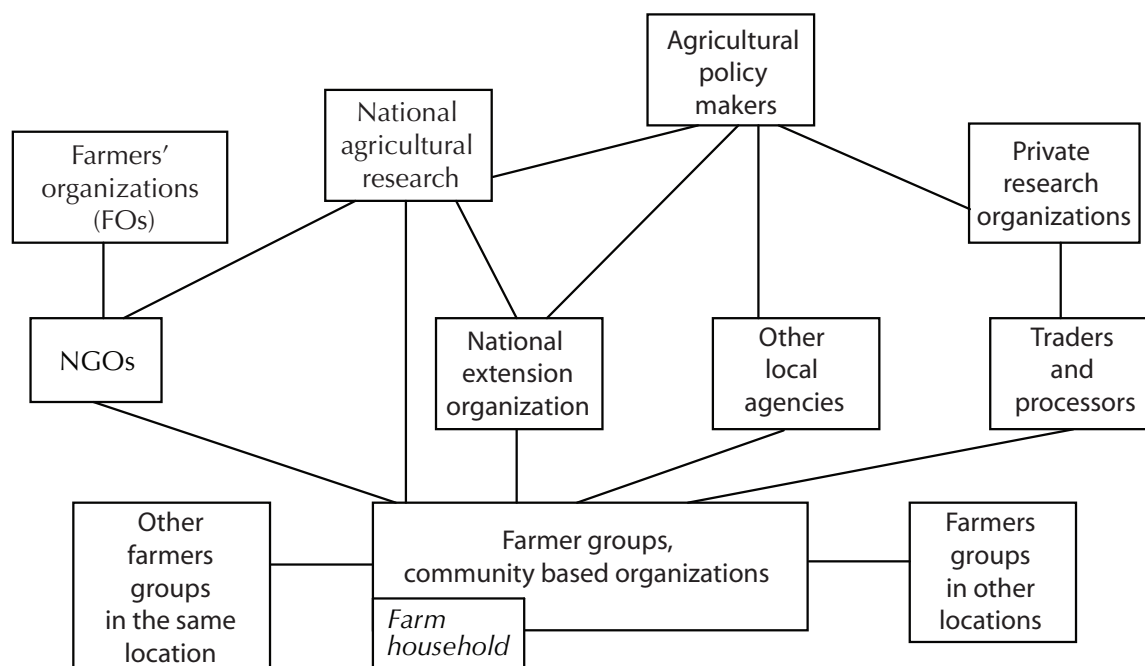
A number of definitions exist for innovation. The simplest definition is Drucker's (1998) as 'purposeful focused change'. It can also be defined as anything new introduced in an economic or social process (OECD 1999). Innovation is a process in which knowledge and technology are generated, disseminated and used by agents, whose interactions both condition and are conditioned by social and economic institutions. In its broadest sense innovation covers the activities and processes associated with the generation, production, distribution, adaptation and use of new technical, institutional and organizational or managerial knowledge. It does not mean new technology alone, but also the institutional and organizational innovations, that emerge as new ways of developing, diffusing and using technology. The capacity for innovation occurs in one or more of four trajectories: Product innovation, Process innovation, Management or Organizational innovation and Service delivery innovation. It is also found that the two factors of importance in innovation are Knowledge and Networking, i.e. value of knowledge increases with its use, and exchange can only be realized in a cooperative environment.

The innovative performance of an economy depends not only on how individual institutions (firms, research institutes, extension services, universities etc.) perform in isolation, but on how they interact with each other as elements of a collective system and how they interplay with social institutions—values, norms and legal frameworks. Innovation takes place throughout the whole economy, and not all innovations have their origin in formal science and technology nor are all innovations exclusively technical. This new perspective places more emphasis on the role of farmers, input suppliers, transporters, processors and market in the innovation process. Institutional, organizational and managerial types of innovations in particular, more often have their origin in on-site learning processes rather than off-site formal research. These forms of innovations are often far more complex and difficult because one cannot experiment and fine-tune them off-site.

An innovation system is the set of organizations and individuals involved in the generation, diffusion, adaptation and use of new knowledge of socioeconomic significance and the institutional context

that governs the way these interactions and processes take place. A stylized National Agricultural Innovation system is presented in Figure 1.3. An innovation system concept provides a framework for:

- exploring patterns of partnership
- revealing and managing the historical and institutional context that govern the relationships and processes
- understanding research and innovation as an interactive social process of learning and
- thinking about capacity development in a systems sense.



Notes: Only principal linkages indicated.

Figure 1.3. Actors in the National Agricultural Innovation System.

Innovation Systems Perspective (ISP) suggests the analysis of three elements: the components of the system, principally its actors and institutions that affect the process; the relations and interactions between these components; and the competencies, functions, processes and results such components generate.

Key features of the Innovations Systems Perspective are that:

- it focuses on innovation (rather than research) as its organizing principle
- it helps identify the scope of the actors involved and the wider set of relationships in which innovation is embedded
- it escapes the polarized debate between 'demand driven' and 'supply push' approaches
- it recognizes that innovation systems are social systems, focusing on connectivity, learning as well as the dynamic nature of the process
- partnership and linkages are integral parts of the innovation system
- learning and the role of institutions are critical in the process.

National Innovation Systems are all agents, organizations and institutions involved in research, development and delivery of innovations (that are directly or indirectly relevant to agricultural

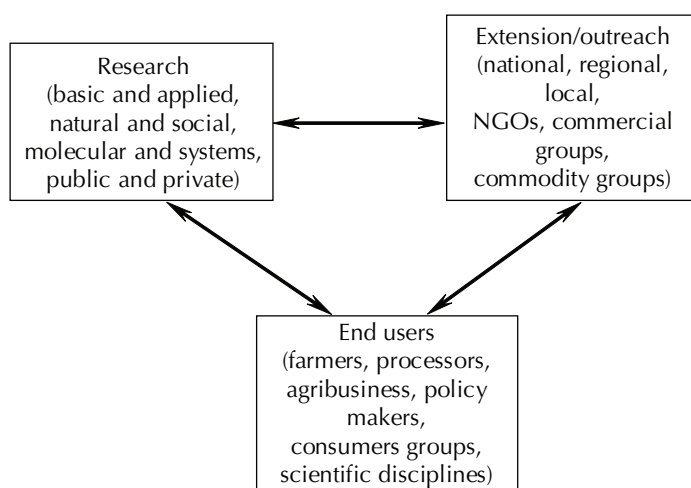
production, processing and consumption) and the use of new knowledge of socioeconomic significance and the institutional context that governs the way their interactions and processes take place.

The National Innovation systems incorporate actors, processes as well as products. The different actors involved include:

- traditional sources of innovation (ITK)
- modern actors (NARIs, IARCs)
- private sector including agro-industrial firms and entrepreneurs (local, national and multinational)
- civil society organizations (NGOs, farmers and consumer organizations, pressure groups)
- those institutions that affect the process by which innovations are developed and delivered (laws, regulations, customs, norms).

All of these innovation systems belong to a 'soft' system.³

The innovation systems perspective leads to the synthesis/triangular (supply and demand) model for commercialization of knowledge as shown in Figure 1.4.



Source: Adapted and modified from Lacy (2001).

Figure 1.4. *The synthesis/triangular model for commercialization of knowledge.*

Partnership and networking for innovation

Partnership and networks can improve the development and delivery of innovations that directly affect the livelihoods of resource-poor or vulnerable households if structured appropriately. Challenges of today's complex society are such that individual agencies and programs cannot succeed in delivering results on their own any longer. A collaborative effort that reaches across agencies, across levels of government, and across the public, nonprofit and private sectors is needed to achieve results. The key tools for doing this are partnerships and networks. Communities are built on connections and better connections create economic opportunity (Krebs and Holley 2002).

Several recent studies illustrate the need for partnerships and networks to support the development and delivery of agricultural innovation. Studies of agro-industrial firms and agro industrial opportunities in the region for instance, suggests that there is high demand for technologies to enhance the quality of value-added agricultural processing, for new marketable products, and for institutional and infrastructural

3. A 'soft' system is an analytical construct/concept that we use to describe a loose conglomerate of different agencies that perform a similar task or work towards a common goal. It is not a real entity and does not physically exist.

improvement to enhance supply chain efficiency (Hall and Yoganand 2002; Chema et al. 2003). To meet these demands, the studies recommended further investment in partnerships and networks to improve strategic, managerial and institutional capacity in the agricultural sector (ASARECA 2003).

Networking is a process by which two or more organizations and/or individuals collaborate to achieve common goals (Waring 1997). Theoretically a network consists of two things: nodes and links between those nodes. In social network analysis, the nodes of concern are people, groups and organizations and the links may be social contacts, exchanges of information, political influence, money, joint membership in an organization, joint participation in specific events or many other aspects of human relationships (Davies et al. 2003).

Partnership is an alliance in which different individuals, groups, or organizations agree to a common goal, work together, share resources, share the risks as well as the benefits, review the relationship regularly, and revise their agreement as necessary.

Networks potentially offer opportunities for taking advantage of economies of scale and scope as well as for developing capabilities necessary to respond to old challenges of underdevelopment and new challenges of climatic change, civil strife, diseases such as HIV/AIDS and other crises. Networks aim to exploit comparative advantage and maximize spillover effects.

The primary objectives of networks are:

- to jointly address complex issues that cannot be effectively addressed by any one partner/ institution
- to improve the effectiveness and efficiency of resource use and
- to avoid duplication of efforts, exploit complementarities and synergies.

Networks and networking continue to serve as a means of sharing information for competitive and cooperative reasons among organizations and individuals with common interests. According to Creech and Willard (2001), there has been a surge of experimentation with network models to fast-track sustainable development in the last 10 years with emergence of information and communication technology being a significant driver.

Networking is a means of giving greater regional, national or international impacts to the activities of community-based organizations. There is evidence to suggest that partnerships and networks are playing an increasingly important role in addressing global issues such as health, environment, finance and governance (World Bank 2002). In the international agricultural R&D community, there is a similar interest in promoting greater collaboration among diverse actors in the sector, including key international organizations (CGIAR 1998; GFAR 2003), leading agricultural research firms (Barry and Horsch 2000; Richer and Simon 2000; Shear 2000) and non-governmental organizations engaged in agricultural science and technology (James 1996).

Different studies indicate that it is worth investing in networking of different actors in society because their contribution to learning and innovation for sustainable development is tremendous. Moreover, weak linkages among research, education and extension institutions result in systematic bottlenecks in national agricultural technology systems and limit their effectiveness to contribute to development (van Crowder et al. 1997). As increasing number of players enter the field, it is evident that a synergy would be created by working in partnership (Biggs 1989).

According to Farrington (1994), a network with a sectoral (e.g. agriculture), or subsectoral (e.g. irrigation or crop processing) mandate generally operates more closely with ultimate beneficiaries (such as those deriving livelihoods from agriculture) than those concerned with generic or cross-cutting themes such as methods of agricultural research or extension.

Every network arises in response to a unique set of circumstances: the challenges it proposes to address, the organizations and individuals available and interested in working together and the resources available to support the work. The five major elements of network performance and related indicators of success as indicated by Creech and Ramji (2004) includes effectiveness, structure and governance, efficiency, resources, and sustainability and life cycle. Some of the most common methodologies (Willard 2001) to assess the impact of network are:

- SWOT analysis (strengths, weaknesses, opportunities, threats)
- results-based management
- logical framework analysis
- outcome mapping
- appreciative inquiry.

In networking and partnership, the combined strengths and skills enable individual entities and society to function more effectively and successfully. The main motivation is to maximize mutual benefits on issues of common interest. Furthermore, partnerships should be seen as a means for generating innovation and not as an end in itself.

1.3.7 Rural livelihoods⁴

Poverty is multidimensional, it goes beyond income and includes vulnerability and lack of voice. The poor have assets on which they can draw (and which they can build up), they can use to pursue multiple livelihood strategies and outcomes, often by managing a portfolio of part-time activities. The poor generally have limited entitlements, are commonly deprived of those they do have, and have inadequate information, knowledge and power to claim them.

The Sustainable Livelihoods (SL) framework argues that the poor have assets and choices; development is not merely about increasing income, but about broadening livelihood-related choices. In its broadest conception, the purpose of extension is to help in broadening choice. It is clear that the very poorest are unable to engage in production and even if they do; they are producers, consumers and labourers at the same time. Hence, they cannot be helped by agricultural extension directly. Here social policy will take on a more important role, incorporating livelihood extension and safety nets.

Sustainable livelihood approaches identify the current livelihood strategies and objectives of the poor, in the context of vulnerability, the influence of policies, institutions and processes and current levels of access to assets and entitlements. According to Christoplos et al. (2001), poor producers face high transaction costs due to limited information and weak infrastructure to access markets, new quality standards which may be unattainable, and growing instability as major purchasers (such as supermarkets) shift bulk purchases from one country (or continent) to another in response to short-term market fluctuations. This stresses that the poor draw on a range of assets, which they either own or can access, in order to achieve a range of livelihood outcomes (going beyond income to include greater well-being, increased voice and reduced vulnerability). To do so, they pursue a range of livelihood strategies,

4. This section is heavily drawn from Christoplos et al. (2001).

often managing a 'portfolio' of part-time activities, and changing the composition of the portfolio in response to emerging needs, opportunities or constraints. Part of the outcome of these strategies (such as higher income) will be consumed; part may be re-invested back to replenish or strengthen their livelihood assets, and part may be used to reduce vulnerability. The types of strategy they can pursue are influenced by policies, and by formal and informal institutions and processes. Of crucial importance to the poor is access, not only to assets (and low ownership of assets is clearly an underlying feature of poverty), but also to the benefits provided under, for instance, government programs. Such benefits can be either production-oriented (e.g. subsidies, credit, training) or protection-oriented (e.g. pensions, access to health facilities). Figure 1.5 depicts the sustainable livelihoods framework.

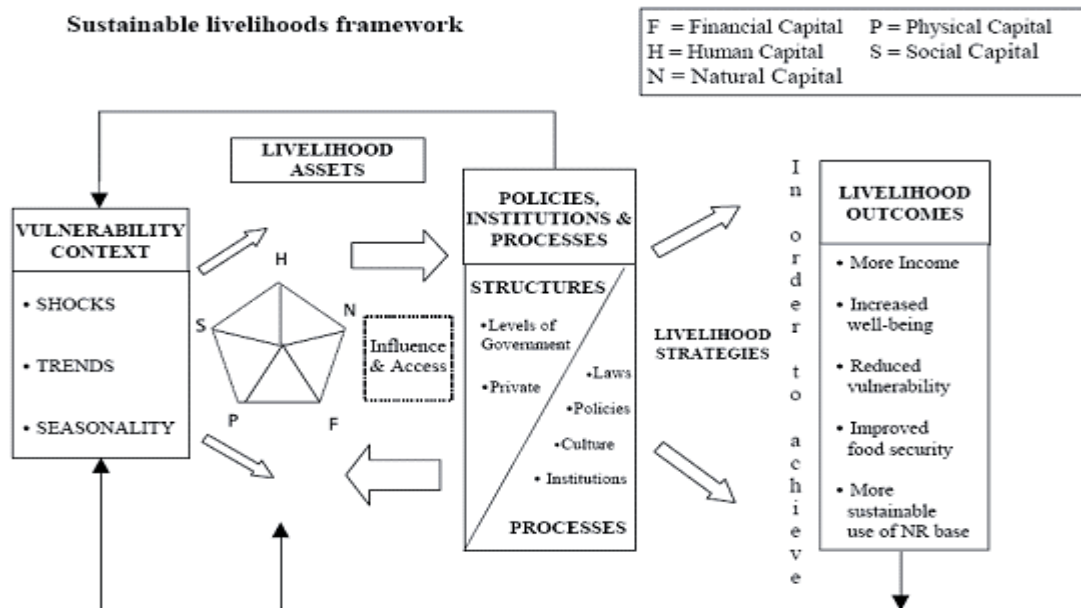


Figure 1.5. Sustainable livelihoods framework.

Four further aspects of poverty are:

- The high transaction costs faced by the poor in production and trade: these impact the poor disproportionately due to access problems caused by weak infrastructure, poor organization and adverse local power relations; appropriately focused extension involves providing more complete knowledge of alternatives and likely outcomes.
- The high risk facing the poor when it comes to breaking out of traditional patterns of production and associated social systems, which may provide some social protection, but are often deeply exploitative; again, although extension cannot directly provide a solution to such dilemmas, it can help by promoting greater awareness of the potential returns and risks associated with alternatives.
- The high priority given by the poor to protecting themselves against vulnerability—evident in, for instance, the 'defensive' ways in which they use for social protection purposes some of the microfinance intended for productive activities. This may place limits on the extent to which they are prepared to engage in the types of productive activity that extension usually promotes. Furthermore, the poor do not progress on a simple linear path from vulnerability to accumulation: those apparently accumulating in one season might well be barely coping in the next.

- The limited impact that production-focused interventions can have on the destitute, and the need to supplement these by safety nets, especially where the poor—such as those chronically sick, the old, and those caring for large numbers of dependents—are unable to sell their labour, as well as where chronic conflict, HIV/AIDS and other factors have led to systemic collapse. They urge an approach to extension which is not concerned merely with agricultural production advice, or agricultural inputs. Rather, they suggest, first, that agricultural and rural development strategies have to be located in the context of the rights and livelihood aspirations of the poor; second, that production and protection strategies have to complement each other; and, third, that an extension approach which is geared broadly to livelihoods contexts rather than narrowly to crop or livestock production contexts is more likely to be of benefit to the poor.

1.3.8 Agri-food chain/value chain

A value chain describes the full range of activities which are required to bring a product or service from conception, through the different phases of production, delivery to final consumers, and final disposal after use (Kaplinsky and Morris 2000). It is worth noting that production is only one of a number of value added links in the agri-food chain. Some people refer to this chain as from hoe (plough) to the finger (fork). A simple value chain has four basic links (Figure 1.6).

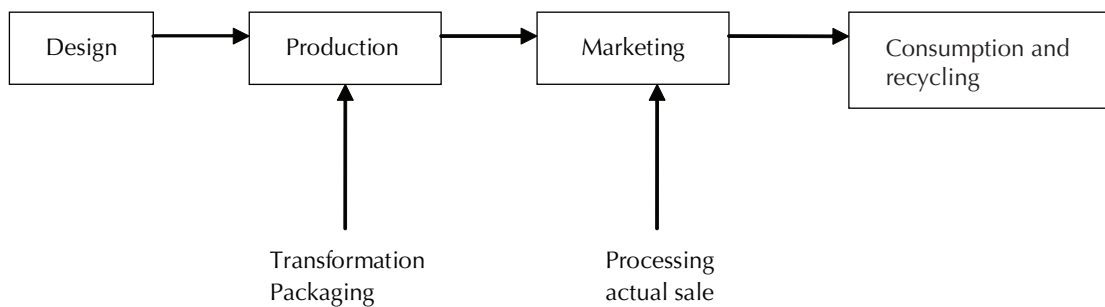


Figure 1.6. *The four basic links in a simple value chain.*

In the real world value chains are much more complex than this simple depiction. A good example is a furniture industry shown in Figure 1.7.

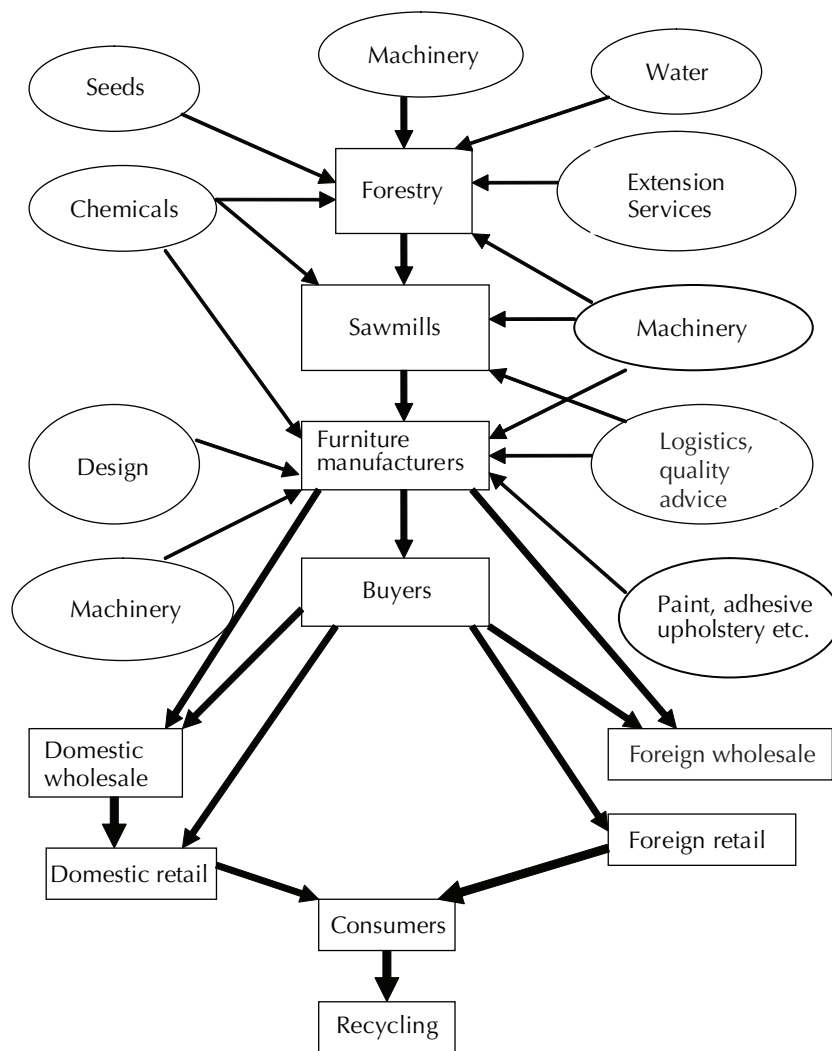
In many circumstances, the intermediary producers in a particular value chain may feed into a number of value chains. It is also important to note that the share of sales may obscure the crucial role that a particular individual/group controlling a key core technology or input has on the rest of the value chain.

Porter (1985) distinguished two important elements of a modern value chain analysis:

- The various activities which were performed in particular link in the chain.
- Multi-linked value chain or the value system.

Both these elements are subsumed in the modern value chain illustrated in Figure 1.8.

Another concept often used to describe the value chain is the global commodity chain (Gereffi 1994). This approach focuses on the power relations which are embedded in value chain analysis. It explicitly focuses on the coordination of globally dispersed, but linked production systems; where the dominant party varies determining the overall characters of the chain.



Extracted from Kaplinsky and Morris (2000).

Figure 1.7. An example from the furniture industry of a real-world value chain.

Kaplinsky and Morris (2000) identified three main sets of reasons why a value chain analysis is important. These are:

- With the growing division of labour and the global dispersion of the production of components, systemic competitiveness has become increasingly important. Value chain analysis plays a key role in understanding the need and scope for systemic competitiveness.
- Efficiency in production is only a necessary condition for successfully penetrating regional and global markets.
- Entry into the various markets: national, regional and global markets require an understanding of dynamic factors within the whole value chain.

In addition, in many developing countries there is heavy emphasis on the commercialization of the smallholder production system; and production is increasingly becoming market-oriented. In order to reap the medium benefit, it is important to understand the nature, structure and the dynamics of the value chain related to the various enterprises produced by the smallholder farmers. Given the new agricultural innovation system perspective, not only we need to understand the dynamic but should

also focus on the enabling environment, facilitating institutions as well as the facilitating services associated with a given value chain as shown in Figure 1.9.

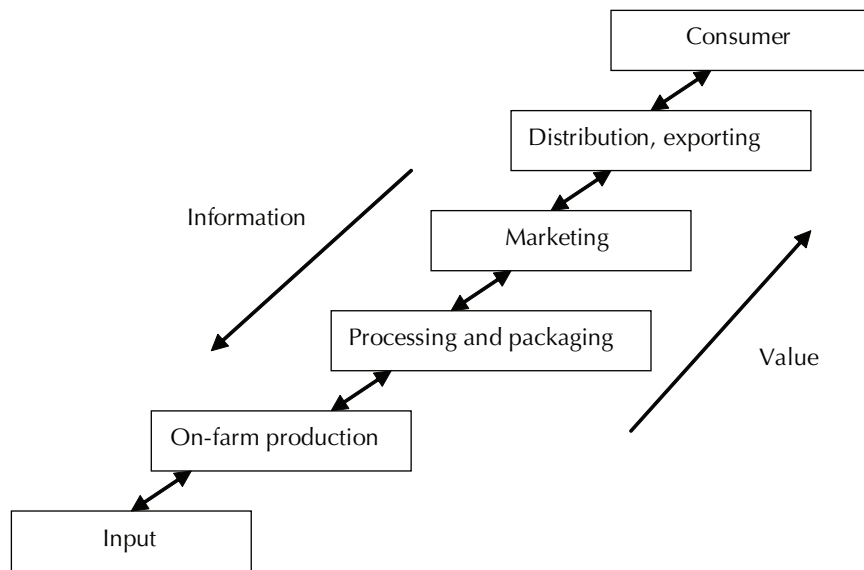


Figure 1.8. Value adding in an agricultural food chain.

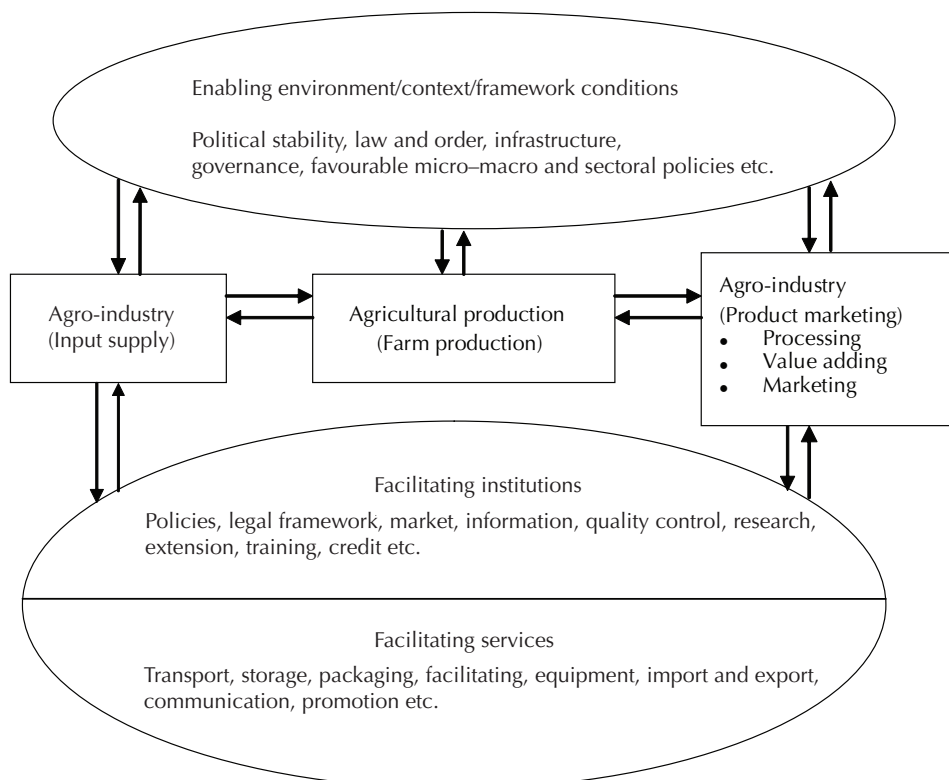


Figure 1.9. Innovation system in agri-business.

The value chain includes life cycle cost elements that are not normally included in common definition of products. Analysis of these extended product/service definitions is key to finding new opportunities. Each element or process in the value chain represents a part of the total cost paid by the customer with respect to the product. Think of the total customer purchases as totalling one dollar. How many cents

go for each value—with added component making up the dollar? We first need to know what major elements are in the larger schemes of providing the customer with products and services directly or indirectly involved in satisfying his/her overall needs, i.e. identifying the various elements in a value chain. Each institution/organization/group of actors may participate in only a limited number of value-creating processes related to its customer's total experience of the product. The key question is whether the institute/organization/group of stakeholders can undertake greater responsibility in its value chain? Accordingly opportunity may exist to add revenue sources to its income. Expansion may be even more desirable when the potential for synergy exists. Opportunity may also exist for new possible processing.

In order to realize a greater proportion of the cost paid by the customer, each actor in the chain adds value to the current operation by:

1. determining the current value chain
2. identifying those parts of the value chain in which he/she is currently involved
3. re-engineering the value chain to reflect changing environments identifying the additional role he/she can play or service he/she can provide
4. identifying other main process cluster to be provided by him/her in this new or modified value chain.

Laying the groundwork for such a transition may involve cost and take time. So, having a pretty clear vision of the desired results help a great deal.

1.3.9 Doubly Green Revolution and African Green Revolution

The Green Revolution was a result of introducing improved varieties with technological packages that allowed the yield potential of the crops to be realized more fully and under conditions experienced by medium to large scale farmers of developing countries. This was heavily experienced in Asia and Latin America where the yield of major cereals (rice, wheat and maize) doubled during the period 1960–90. 'The Green Revolution proved that poverty and hunger could be alleviated through the application of modern science and technology and without it, the numbers of poor and hungry today would be far greater' (Conway 1999). Furthermore, poor and well-to-do farmers have benefited directly through more efficient production that has led to lower unit costs and increased profits. Poor consumers have benefited indirectly through lower prices.

The Green Revolution is generally considered to have been a tremendous success in Asia and Latin America—success at the time being defined as production increases that staved off potential malnutrition, quite apart from concerns about the environment (Wu and Butz 2004). Increasing food production was top priority in the Green Revolution.

Furthermore, the conventional wisdom of the time was that the environment was either insignificant or at least, capable of being easily redressed at a future date, once the main task of feeding millions of hungry people was accomplished. Moreover, there was a strongly held view that a healthy, productive agriculture would necessarily benefit the environment.

However, this has not been the case with the use of Green Revolution technologies over the last 40 years. The combination of pesticides and fertilizers with the HYV seeds, through increased food production, turned out to have an adverse effect on the environment. In order to address environmental issues a doubly Green Revolution was instructed taking lesson from Green Revolution. As Conway

(1999) put it, a doubly Green Revolution is a revolution that is even more productive than the first Green Revolution and even more 'green' in terms of conserving natural resources and the environment. The doubly Green Revolution aims to be equitable, sustainable and environmentally friendly. While the first Green Revolution took as its starting point the biological challenge inherent in producing new high-yielding food crops and then looked to determine how the benefits could reach the poor, the doubly Green Revolution has to reverse the chain of logic, starting with the socioeconomic demands of poor households and then seeking to identify the appropriate research priorities. Its goal is the creation of food security and sustainable livelihoods for the poor.

The concept of doubly Green Revolution goes beyond seed technology to look at knowledge intensive methods to promote agricultural and rural development. The focus here is on both high risk marginal and remote environment as well as high potential areas.

Africa has not yet had a Green Revolution of its own. This is partly because the scientific breakthroughs that worked so well in Asia are not directly applicable to Africa. Africa produces a wide and different variety of food crops using a wide variety of farming systems. Agriculture in Africa depends largely on rainfed agriculture rather than irrigation, leaving them vulnerable to climatic shocks. Africa's farmers also face much higher transport costs, the soils have become severely depleted of nutrients, erosion, deforestation and biodiversity loss also take a toll.

Hence, Africa calls for the launch of an Evergreen Revolution in agriculture driven by the enhanced productivity, profitability, stability and sustainability of the major farming systems of its diverse and rich resources. This productivity-based progress of African agriculture is referred as a 'rainbow revolution' because unlike Asia, where wheat and rice are the dominant food crops, Africa does not have dominant farming system on which food security largely depends.

African Green Revolution or Rainbow Revolution

The proponents and advocates of Millennium Development Goals (MDG) are now calling for a uniquely African Green Revolution for the 21st century. This is based on:

- Combination of science and policies with community empowerment and natural resources management;
- Healthy crops, environmentally sound and profitable smallholder farming systems (Green);
- Diversity of farming systems that reflects African realities and institutions.

The key components of African Green Revolution are: agriculture, nutrition, politics, markets, ecosystem regeneration and policies. In order to achieve these, actions are needed to:

- increase productivity of food-insecure farmers
- improve nutrition of the chronically hungry
- reduce vulnerability through productive safety nets
- increase income and market access
- restore degraded agro-ecosystems

This set of activities calls for political action, enabling policy reforms and community action. It is also important to consider the potential of bio-technology in creating this revolution but this must be developed judiciously with adequate and transparent safety measures.

1.3.10 Positive deviance

This is a new paradigm for addressing today's problems. This approach has been tried in early 1990s in Vietnam to address the issue of malnutrition. But it may be a useful tool in addressing emerging agricultural and rural development issues of the rural poor in Africa.

The term 'deviance' refers to the departure from the 'norm'. Positive deviance (PD) is a departure from the norm which results in a positive outcome. The uncommon behaviour or practices of these people enable them to out-perform their neighbours with whom they share the same problems and resource base. This new paradigm called 'positive deviance' spots 'positive deviants' to identify solutions that are cost-effective, sustainable and internally owned and managed (Positive Deviance 2005). The successful deviant practices that work are then amplified to the community called 'amplifying positive deviance' (Positive Deviance 2005). The key here is to discover local answers to the problem and give everyone access to the secrets.

The positive deviants provide proof that it is possible to find viable solutions today to complex problems before all the inter-related factors underlying the problem can be addressed. The positive deviance not only provides us with an impetus for action, but an accompanying demonstrable successful strategy as well. A critical component of the definition of 'positive deviants' is that PD individuals have exactly the same resource base as their non positive deviant neighbours. Hence, whatever they are doing and whatever resources they are using to achieve their successful outcomes, are by definition, accessible to their neighbours. The use of PD provides two distinctive advantages for those working in development. First, by discovering and sharing the actual successful practices and behaviours used by the positive deviants, development practitioners can make those behaviours/solutions accessible to others. The second is the use of PDs themselves as change agents.

Positive deviance and sustainability

Traditional development efforts are often 'need based'. The development efforts begin by assessing the community needs which are often met through provision of external resources. During the program implementation the community has access to the needed resources through their development partners. Very often, once the program has finished, the external partner will depart and the community returns to their pre-program status.

PD provides a radically different approach in that the resource needed already exists in the community. PD is the tool to help the community find it. Hence, the solutions to the community's problem can be found today within the community. The approach not only ensures that the critical resources are owned by the community, but that the problems' solution is discovered and owned by them as well. The sense of ownership is a critical factor in the sustainability of community development efforts. The very core of PD is the belief in the wisdom and untapped resources inherent in the community. The key is that you cannot import change from outside. Instead, you have to find small, successful but 'deviant' practices that are working in the organization and amplify them. The detailed steps employed in adopting this approach are described in Chapter 5.

References

- Anandajayasekeram P. 1996. Farming systems research: Concepts, procedures and challenges. Paper prepared for the Eastern and Southern Africa Sida/FAO Farming Systems Programme, Harare, Zimbabwe.
- ASARECA (Association for Strengthening Agricultural Research in Eastern and Central Africa). 2003. Strengthening capacity of NARS for managing regional networks and projects. ASARECA, Entebbe, Uganda.

- Ashby J, Barun AR, Garcia T, Guerrero MP, Hernandez LA, Quiros LA and Roa JI. 2000. *Investing in farmers as researchers: Experience with local agricultural committees in Latin America*. Cali, Colombia.
- Barry G and Horsch R. 2000. Evolving role of the public and private sector in agricultural biotechnology for developing countries. In: Persly GJ and Lantin MM (eds), *Agricultural biotechnology and the poor. Proceedings of an international conference, October 21–22, 1999, held in Washington, DC, USA*. CGIAR (Consultative Group on International Agricultural Research), Washington, DC, USA.
- Biggs SD. 1989. *A multiple source of innovation model of agricultural research and technology promotion*. Agricultural Administration (Research and Extension) Network paper. ODI (Overseas Development Institute), London, UK.
- Biggs SD and Smith G. 1998. Beyond methodologies: Coalition building for participatory technology development. *World Development* 26(2):239–248.
- Byerlee D and Collinson P. 1980. *Planning technologies appropriate to farmers: Concepts and procedures*. CIMMYT (International Maize and Wheat Improvement Centre), Mexico City, Mexico.
- Blum A, Röling N and Engel PGH. 1990. Effective management of Agricultural Knowledge Systems (AKS): An analytical approach. *Quarterly Journal of International Agriculture* 29(1):27–37.
- Carr W and Kemmis S. 1986. *Becoming critical: Education knowledge and action research*. Falmer Press, London, UK.
- Chambers R. 1993. *Challenging the profession—Frontiers for rural development*. Intermediate Technology Publications, London, UK.
- Chema S, Gilbert E and Roseboom J. 2003. *A review of key issues and recent experiences in reforming agricultural research in Africa*. Research report 24. ISNAR (International Service for National Agricultural Research), the Hague, the Netherlands.
- Christoplos I, Farrington J and Kidd A. 2001. *Extension, poverty and vulnerability: Inception report of a study for the Neuchâtel Initiative*. Working paper 144. Overseas Development Institute, London, UK.
- CGIAR (Consultative Group on International Agricultural Research). 1998. *The international research partnership for food security and sustainable agriculture. Third system review of the Consultative Group on International Agricultural Research*. CGIAR secretariat, Washington, DC, USA.
- Conway G. 1999. *The doubly Green Revolution: Food for all in the 21st century*. Penguin Books, New York, USA.
- Creech H and Willard T. 2001. *Managing knowledge networks for sustainable development*. International Institute for Sustainable Development, Winnipeg, Canada.
- Creech H and Ramji A. 2004. *Knowledge networks: Guidelines for assessment*. International Institute for Sustainable Development, Working Paper Winnipeg, Canada.
- van Crowder L, Lindley LI and Doron N. 1997. *Agricultural education for sustainable rural development*. FAO/SARD (Food and Agriculture Organization of the United Nations), Rome, Italy.
- Cummings FH. 1995. Role of participation in the evaluation and implementation of development projects. Paper presented at the International Evaluation Conference, Vancouver, Canada, 1–5 November 1995.
- Davies J, Alistair D and Sure Y. 2003. *OntoShare: A knowledge management environment for virtual communities of practice*. K-CAPO3. Sanibel Island, Florida, USA.
- Drucker PF. 1998. The discipline of innovation. *Harvard Business Review*.
- Elliott H. 1987. Diagnosing constraints in agricultural technology management systems. Paper presented at the international workshop on agricultural research management. ISNAR, the Hague, the Netherlands.
- FAO (Food and Agriculture Organization of the United Nations)/World Bank. 2000. *Strategic vision and guiding principles*. Agricultural Knowledge and Information Systems for Rural Development (AKIS/RD). FAO, Rome, Italy.
- Farrington J. 1994. *Public sector agricultural extension: Is there life after structural adjustment?* ODI Natural Resource Perspectives No. 2.
- Fernandez W and Tandon R. (eds). 1981. *Participatory research and evaluation: experiments in research as a process of liberation*. Indian Social Institute, New Delhi, India.
- Gereffi G. 1994. The organization of buyer-driven global commodity chains: How US retailers shape overseas production networks. In: Gereffi G and Korzeniewicz M (eds), *Commodity chains and global capitalism*. Praeger, London, UK.
- GFAR (Global Forum on Agricultural research). 2003. Parallel sub-plenary sessions on global and inter-regional partnership program's. In: *Linking research and rural innovation to sustainable development, 2nd triennial GFAR conference, May 22–24, Dakar, Senegal*.

- Hall A and Nahdy S. 1999. *New methods and old institutions: The systems context of farmer participatory research in national agricultural research systems. The case of Uganda*. ODI, AgREN Paper No. 93. ODI, London, UK.
- Hall A and Yoganand B. 2002. New institutional arrangements in agricultural R&D in Africa: Concepts and case studies. Paper prepared for conference on targeting agricultural research for development in the semi-arid tropics of sub-Saharan Africa, Nairobi, Kenya, July 1–3, 2002.
- Huizer G. 1979. Research-through-action: Some practical experiences with peasant organizations. In: Huizer G and Mannheim B (eds), *The politics of anthropology: From colonialism and sexism toward a view from below*. World Anthropology Series. Paris, France.
- Huizer G. 1983. *Guiding principles for people's participation projects*. FAO (Food and Agriculture Organization of the United Nations), Rome, Italy.
- IFPRI (International Food Policy Research Institute). 2005. *Agricultural R&D in sub-Saharan Africa: Recent country briefs and datasets*. IFPRI, Washington, DC, USA.
- James CJ. 1996. *Agricultural research and development: The need for public–private sector partnerships. Issues in Agriculture*. CGIAR (Consultative Group on International Agricultural Research), Washington, DC, USA.
- Jiggins JLS. 1986. *Gender related impacts and the role of international agricultural research centers*. Study Paper 17, CGIAR (Consultative Group on International Agricultural Research), Washington, DC, USA.
- Kaplinsky and Morris. 2000. *A handbook for value chain research*. Paper prepared for the IDRC (International Development Research Centre), Ottawa, Canada.
- Krebs V and Holley J. 2002. *Building sustainable communities through network building*.
- Lacy WB. 2001. Generation and commercialization of knowledge: Trends, implications and models for public and private agricultural research and education. In: Wolfe S and Zilberman D (eds), *Knowledge generation and technical change: Institutional innovation in agriculture*. Kluwer Academic Press, Belgium. pp. 27–54.
- van Laurens Veldhuizen, Waters-Bayer A and de Zeeuw H 1997. *Developing technology with farmers. A trainers' for participatory learning*. ZED Books Ltd, London UK. 239 pp.
- Lewin K. 1958. *Group decision and social change*. Holt, Rinehart and Winston, New York, USA.
- Matata JB, Anandajayasekeran P, Kiriro FN, Wandera EO and Dixon J. 2001. *Farming systems approach to technology development and transfer*. A Source Book, FARMESA, Harare, Zimbabwe.
- Nagel UJ. 1979. Knowledge flows in agriculture: Linking research, extension and the farmer. *Zeitschrift für Ausländische Landwirtschaft* 18(2):135–150.
- Narayan N. 1993. *Participatory evaluation tools for managing change in water and sanitation*. World Bank Technical Paper 207. World Bank, Washington, DC, USA.
- Norman DW, Siebert JD, Modiakgotla E and Worman FD. 1994. *Farming systems research approach. A primer for eastern and southern Africa*.
- Oakley P. 1991. *Projects with people: The practice of participation in rural development*. ILO (International Labour Organisation), Geneva, Switzerland.
- OECD (Organization for Economic Cooperation and Development). 1999. *Managing national innovation systems*. OECD, Paris, France.
- Porter ME. 1985. *Competitive advantage: Creating and sustaining superior performance*. The Free Press, New York, USA.
- Positive Deviance. 2005. *A new paradigm for addressing today's problems today*. http://www.hpl.hp.com/personal/Barbara_Waugh/articles/positive_deviance.html
- Richer DL and Simon E. 2000. Perspectives from industry: AgrEvo. In: Lele U, Lesser W and Horstokette-Wesseler G (eds), *Intellectual property rights in agriculture*. Environmentally and Socially Sustainable Development Series. Rural development. World Bank, Washington, DC, USA.
- Röling N. 1986. Extension and the development of human resources: The other tradition in extension education. In: Gwyn EJ (ed), *Investing in rural extension: Strategies and goals*. Elsevier, London, UK.
- SDR. 2005. Special event on Green Revolution in Africa. Background document prepared by SDR, Committee on World Food Security.
- Shear RH. 2000. Perspectives from industry: Monsanto. In: Lele U, Lesser W and Horstokette-Wesseler G (eds), *Intellectual property rights in agriculture*. Environmentally and Socially Sustainable Development series. Rural development 3. World Bank, Washington, DC, USA.
- Sims H and Leonard D. 1989. *The political economy of the development and transfer of agricultural technologies*. Linkages Theme Paper No. 4. ISNAR (International Service for National Agricultural Research), the Hague, the Netherlands.

- Sohng SSL. 1995. Participatory research and community organizing. Working paper presented at the New Social Movement and Community Organizing Conference, University Of Washington, Seattle, WA, November 1–3 1995. <http://www.interweb-tech.com/nsmnet/docs/sohng.htm>.
- Susman GI. 1983. *Action research: A sociotechnical systems perspective*. Sage Publications, London, UK. pp. 95–113.
- Waring B. 1997. *HIV/AIDS networking guide*. International council of AIDS service organizations.
- Willard T. 2001. *Helping knowledge networks work*. Version 1.0. International Institute for Sustainable Development, Winnipeg, Canada. Available at: https://doc.telin.nl/dscgi/ds.py/Get/File-23047/social_capital_gigacscw_final.pdf
- World Bank. 2002. *The CGIAR at 31: An independent meta-evaluation of the Consultative Group on International Agricultural Research*. Volume 3. World Bank, Washington, DC, USA.
- Wu F and Butz W. 2004. *The future of genetically modified crops: Lessons from the Green Revolution*. Rand Corporation, Santa Monica, USA.

2 The past, present and future of extension service

2.1 Introduction

2.2 Historical evolution of agricultural extension

2.3 Generic problems and approaches to address them

2.4 Factors of success in the knowledge/technology dissemination process

2.5 Factors affecting clients' access to extension services

2.6 Changing paradigms in extension, and roles of extension agents

2.7 Emerging challenges and opportunities

2.8 The future of extension services

2.1 Introduction

The economy of most developing countries is dependent on rural based small-scale agriculture whose productivity is not increasing (in some cases, even declining) contributing towards household food insecurity, malnutrition and poverty. The ever-increasing decline in agricultural production has been attributed to a number of factors, one of which has been inappropriate and/or ineffective dissemination of technologies.

Agriculture has already reached the limits of land and water, and so future increase in food production must exploit biological yields on existing land. In Asia, the growth rate fostered by the Green Revolution has slowed. In Africa, per capita food production has declined in most years since 1970. In many parts of Latin America and the Caribbean, population pressure and extensive agriculture seriously threatens the environment. In the industrialized world, opposition to high input of agriculture is mounting in response to such issues as animal rights, fear of genetically engineered products, and soil and water pollution. Extension funding and delivery face difficulties inherent in the extension mandate due to the magnitude of the task, dependence on wider policy and other agency functions, problems establishing the cause and effect necessary to obtain political and financial support, liability for public service functions beyond agricultural knowledge and information transfer, fiscal sustainability, and interaction with knowledge generation.

For a long time, development of agriculture in developing countries mainly consisted of farmers and communities being told what to do, often by institutions and agents who have not taken sufficient time to understand their real needs and practices. Over the last two decades, government and non-governmental organizations have recognized the need to move away from instruction and blue print solutions, towards more participatory approaches which involve communities in setting and fulfilling their own development goals and solutions. Hence, the system-oriented and participatory approaches are being increasingly integrated into the emerging research and development (R&D) paradigm.

The environment of agricultural extension has been changing with more focus on food and nutrition security, poverty alleviation, entry of new actors such as the private sector and NGOs in the delivery of extension services, changed R&D paradigms and bottom-up approaches for end user involvement in decision-making. However, while the public spending on extension has been shrinking, the role of government in extension services delivery is also being examined, sometimes separating the financing of extension programs from the delivery of extension services. Alongside a new approach has been emerging: considering extension as facilitation and producers (farmers) as clients, sponsors and stakeholders rather than beneficiaries. The key trends reflect global socioeconomic change and driven by key concepts such as participation, client orientation, decentralization as well as developments in modern information and communication technology.

The design of agricultural extension programs in developing countries has been the subject of heated debate. Guided by these debates, extension services have undergone several transformations in the past few decades (Byerlee 1994). In this part of the source book an attempt is made to trace the historical evolution of extension system/services. Then the generic problems of extension and the steps undertaken to address these problems are discussed. The following section reviews the various approaches used in disseminating information and knowledge. Finally, the changing roles and emerging challenges are discussed.

2.2 Historical evolution of agricultural extension

Although agricultural extension has roots as far back as 1800 BC, formal extension in most countries did not start until the late 1800s AD. The first modern extension service was started in Ireland during the potato famine in 1845 (Swanson et al. 1997). In the United States and Canada, formal extension started during the late 1800s. France began a national service in 1879 using itinerant agriculturists; Japan and many of the British colonies also started extension services during this time.

The word extension derives from an educational development in England during the second half of the nineteenth century. Around 1850s, discussions began in the two ancient universities of Oxford and Cambridge about how they could serve the educational needs of the rapidly growing populations in the industrial, urban area, near their homes. It was not until 1867 that a first practical attempt was made in what was designated as 'university extension' but the activity developed quickly to become a well-established movement before the end of the century. The dissemination of relevant information and advice to farmers however has a long chequered history prior to the emergence of modern forms of agricultural extension in the nineteenth century.

In the early years of this century, extension services in their formative stage were relatively small in scale and limited in the scope of their work and contact with farmers, and their organization was often somewhat haphazard even though based on legislation. They were organized predominantly either by central or local governments, or by agricultural colleges, usually in close association with experiment stations, or by farmers' organizations, or combinations of these parent bodies. As the century has progressed, the organizations have matured in that changes have often occurred to their parent affiliations, government funding has become broader, especially in 'the north' and the extension workers have become better trained and more professional.

Fifty years ago, agricultural extension organizations in developing countries mirrored the administrative traditions of the former colonial powers (Axinn and Throat 1972). Like other agricultural support services,

they were geared to production and marketing of export commodities. Accordingly, crop-oriented extension programs were common. However, as noted by Antholt (1994), the scope of extension programs expanded in the fifties as the newly independent states of Asia and Africa sought to increase food production and to spread the benefits of improved farming techniques more widely. Extension organizations therefore began to aim at broad national and farming system coverage. The economic strategies of these pioneering years relied on heavy state intervention, import substitution and rapid industrialization. Extension programs often relied on the proposition that farming productivity was held back not so much by technological and economic constraints but by farmer apathy, inadequate social arrangements and lack of local leadership. Often, extension agents came to be viewed as the foot soldiers of 'nation building' campaigns aiming at multiple economic and social objectives.

The structure of the original extension services varied. Many were state-funded and used itinerant extension agents. Demonstrations were an important aspect of extension. In the United States, extension was linked with the 'land-grant' universities, or schools mandated by Congress in 1862 to extend university knowledge to non-students. Extension clientele of the original services were mostly larger landholders, many of whom were growing commodities and export crops. This was especially true in colonial areas in the tropics.

Initial extension structures were top-down, with information coming from the university or ministry of agriculture, and filtering to the farmers through extension agents. Farmers were involved only to receive information; they did not pay for services nor give much input as to their needs.

A good example of this was the early United States extension model. The US system is structured as a 'cooperative' system in terms of funding and control between federal, state, and county (Seevers et al. 1997). The US system is one of the older models of extension that has proved very successful in certain areas. This model is also known as 'transfer of technology' because technology is developed on research stations and universities and then transferred through extension agents to farmers.

Another model, developed essentially by the British and other colonial powers to fully develop their cash crops is the commodity-based extension service. This tends to be quite top-down in terms of structure. The commodity group conducts research, which is shared with extension agents who pass the information on to farmers. The commodity group funds the extension service. Commodity extension uses vertical linkages, which allow for effective management.

Developing country extension models are usually top-down structures as well, often located within the ministry of agriculture. It is not usually formally associated with universities (Boone 1989) and therefore has poor linkages with research.

A number of necessary conditions were identified for agricultural extension to evolve (Swanson et al. 1997). These include:

- Information has been assembled, systematized and made available on good, progressive, or new agricultural practices suited to a particular environment, and is based on either or both the accumulation of experience or findings from research.
- This information is used among other things, to educate professional agriculturalists who may further enlarge or refine this body of knowledge or become active promoters and disseminators of it.

- An appropriate administrative or organizational structure exists within which the dissemination activities may be established and conducted.
- There is a legislative or some other official mandate or influential proponents, which prescribes or enables that agricultural extension work is desirable and must occur.
- There are invariably a variety of antecedents, which have attempted protoforms (basic frames, used until a more suitable form can be found) of agricultural information and advice dissemination.
- The incidence of critical situations, such as famine, crop failure, soil exhaustion, or altered economic conditions or relationship may create an immediate cause for initiating the organization of extension work in the form of mass campaigns.

2.2.1 Pre-independence

In this era, emphasis was placed on commodity programs—expatriate ‘rural agents’ to organize communities and serve as contact points for government authorities, input and credit suppliers and buying agents. Their broadly defined roles often extended into human health, census taking and tax collection.

2.2.2 Immediate post-independence

Characteristics of the period between the late 1950s and 1960s:

- institutionalization of many national extension services
- agricultural extension became attached to the Ministry of Agriculture
- confidence in western technology led to the adoption of ‘diffusion model’ or ‘Technology Transfer model’ of extension delivery—a hierarchical process of technology transfer backed by advances in mass media
- focus was also on interpersonal communication and community development
- the agricultural service was multifunctional, with weak connections to agricultural research
- extension agents were entrusted with a variety of functions ranging from credit delivery, inputs distribution, and sundry coordination duties such as: clerical, statistical, or even political chores.

2.2.3 Extension in the 1970s

During the 1970s, the extension systems in developing countries changed as the realization came about that there was a need to reach more farmers and to better train extension agents. The main developments included integrated rural development approaches, and the emergence of Training and Visit (T&V) extension systems. The ‘diffusion model’ of extension gave way to the ‘get the technology right’ model, where farm-level constraints explained non-adoption of technology, with a prescription to ease the constraints through integrated packages of services (Axinn 1988).

This ushered in the World Bank-sponsored Training and Visit System (T&V). This system used contact farmers in order to multiply extension’s effect. Being highly structured, this system was top–down and characterized by rigidity and high costs. Funding often came through loans from the World Bank. Working mainly with contact farmers stifled diversity, because many were large scale male farmers who had little in common with small-scale resource-poor farmers.

The T&V system was designed to address some of the weaknesses in the previous extension approaches, such as weak linkages with research and limited training of field extension workers. As its name suggests,

the basic premise of T&V was training (instilling professionalism in extension agents) and regular visits to farmers by the agents. The T&V model is described in detail in Chapter 3 of this source book.

Whatever the arguments, there are indications that T&V had many shortfalls. Some feel that T&V focused so much on training that the system lost sight of the goals of meeting farmers' needs and improving their livelihoods. It was essentially a supply-driven and top-down system, promoting agricultural messages that had been designed and developed by research scientists, with limited input by the ultimate users of the technologies (the farmers). The delivery method was perhaps efficient, but the messages often irrelevant, according to farmers surveyed. At the end of the Kenyan T&V system in 1998, the extension service was characterized by weak management, a lack of strategy for the service, and general ineffectiveness (Gautam 2000).

Training and Visit, like the general extension approach, was characterized by limited feedback from farmers. The packages were somewhat mechanistic, and not flexible enough to meet the needs of the large variety of farming systems. T&V relied on contact farmers, and tended to neglect the larger rural population (Moris 1991). In the Kenyan experience, there were no real mechanisms for choosing contact farmers who truly represented many of the farming systems in the areas. The hierarchical structure set up by the Bank prevented innovation, partnering and efficiency. Despite a supposedly improved system, farmers before and after the Kenyan T&V system said that they were not receiving advice from extension, or else not the advice that they needed (Gautam 2000).

This period saw the emergence of the farming systems approach to research and extension (FSR-E).

2.2.4 Extension in the 1980s

Extension during this period was characterized by:

- increased emphasis on participatory approaches
- preoccupation with increasing productivity of women and preserving ecosystems along with attempted cost recovery and privatization schemes (World Bank 1990)
- continued emphasis on training and visit extension system and growth of FSR-E
- focus on institutionalization of FSR-E.

The public sector extension was criticized for not being relevant, adequately effective, efficient and, at times, for not pursuing programs that foster equity.

Support for extension declined in the 1980s and donors were unwilling to fund large-scale public-sector recurrent expenditures, which led to further under financing, staffing shortages, and contraction of extension services (Amanor and Farrington 1991). Given the fiscal restraint, there was extreme pressure to demonstrate the pay-off to investment in extension and explore alternatives to public financing by involving the private sector, local authorities and producer groups.

2.2.5 Extension in the 1990s

Extension in this decade bore these characteristics:

- new approaches were piloted in an environment of fiscal stringency
- direct farm level links were stressed between researchers and farmers
- institutionalization of systems approach to research and extension continued

- emergence and wider acceptance of participatory research methods
- more sustainable approaches to extension funding involving greater flexibility and multiple partners (Gustafson 1991)—pluralism in service provision
- fall of T&V systems and the emergence of the new approaches such as Farmer Field Schools (FFS)
- new role for extension staff—a more facilitating and catalytic role
- greater focus on changing the mindset of change agents.

2.2.6 Current scenario: Diversity and institutional pluralism

Much literature (Schwartz and Kampen¹ 1992; World Bank 1995; Contado 1997) suggested the need for a pluralistic extension system because public extension services need to be accountable to both the clients of the services and the wider population. Contado (1997) identified a number of advantages that a national pluralistic policy of extension will bring about:

- It encourages wider participation in providing resource support and control of the extension program of the country. As a consequence, more resources are allocated for extension or at least a clearer accounting of resources devoted to extension is achieved.
- It creates complementarity and synergy in the use of resources for extension by different donors, which are recognized as part of the pluralistic extension policy.
- Research and extension linkage is made functional in the field.
- It creates a cohesive critical mass of extension people who could address large numbers of farmers as well as the increasing variety and complexity of subject matters needed by farmers.
- It lessens the resource burden upon the central government, or on a single agency, or on the private sector or on farmers themselves.

National reforms and other initiatives that in essence aim at an optimum mix of institutional pluralism have followed different paths for achieving their objectives. Grassroots associations, the NGO sector, farmers' associations are major stakeholders in this process.

Potential providers of agricultural extension services (Table 2.1) fall into three main groups: the public sector, the private nonprofit sector and the private for-profit sector. Distinctions between various providers are important because of the range of services each typically offers, and the incentives they have for delivering these services. The private (profit) sector includes all agents whose objective is to generate profits directly or indirectly for their owners, members or shareholders. The private nonprofit sector differs from the profit sector in one important respect: rather than distributing the residual earnings (if any) to individuals who exercise control, it reinvests profits to finance future activities (Umali-Deininger 1997).

The private-for-profit sector comprises three main sets of actors. Commercial suppliers of agricultural inputs provide 'free' information and advice linked directly to the use of their technology. They are increasingly concerned to ensure that accurate information is passed on by input dealers at point of sale and so may be involved in training and providing technical support to their dealer networks. At the other end of the production process, companies which purchase, process and market agricultural produce provide information and services in order to assure quality and reliability of supply. Much less common in developing countries is the autonomous emergence of for-profit organizations (firms, partnerships) or individuals specializing in providing consultancy and advisory services. However,

1. Schwartz and Kampen (1992) referred to 'extension pluralism' as the philosophy where a national extension system reflects different strategies to meet the needs of various agro climates and farmers.

some reforms, especially in Latin America, have helped to facilitate this in the context of a shift of both delivery and funding from the public sector.

Table 2.1. *Providers of agricultural extension services*

Public sector	Private sector (non-profit)	Private sector (profit)
<ul style="list-style-type: none"> Ministries and Departments of Agriculture Agricultural Research Centres 	<ul style="list-style-type: none"> Local and international NGOs Bilateral and multilateral aid projects Universities Community boards, associations and foundations (including farmers' groups) Other noncommercial associations 	<ul style="list-style-type: none"> Commercial farmer, or farmer group operated enterprises (including cooperatives) where farmers are both users and providers of agricultural information Commercial production and marketing firms (such as input manufacturers and distributors) Agro-marketing and processing firms Trade associations Private consulting and media companies (publishing and telecommunication firms)

Source: Adapted from Umali-Deininger (1996).

The key issue of creating a pluralistic service, and one suggested by various authors (Schwartz and Kampden 1992; Ameer 1994; Dinar 1996; Holden et al. 1996; Umali-Deininger 1997; Zijp 1998) is a need to find an appropriate 'mix' of public and private funding and delivery mechanisms for extension, which will achieve differing agricultural goals and serve diverse target populations.

Three major lessons for extension are:

- It is important to make new things visible: An important role of extension is to make visible the state of the environment and the extent to which present farming practices are untenable. In addition, extension can demonstrate the feasibility of sustainable practices. Even more important is to give farmers the tools for observation and to train them to monitor the situation on their own farms.
- The use of farmers' knowledge: The location-specific nature of sustainable agriculture implies that extension must make use of farmers' knowledge and work together with farmers. Often, indigenous practices, which have been ignored under the impact of chemical farming, can be fruitfully revived. Indigenous technology development practices and farmer experimentation can be an important 'entry point' for introducing sustainable farming practices (Brouwers and Roling 1999).
- An emphasis on facilitating learning: Instead of 'transferring' technology, extension workers must help farming 'walk the learning paths'. Extension workers should seek to understand the learning process, provide expert advice where required, convene and create learning groups, and help farmers overcome major hurdles in adapting their farms.

2.3 Generic problems and approaches to address them

An FAO survey in 1989 identified a number of problems with respect to the extension system (Swanson et al. 1997):

- Low extension staff to farmer ratio:

- Developing countries 1:1800 to 1:3000
- Developed countries 1:400
- Majority of the extension staff work in public agricultural extension systems
- About 58% of the extension resources were directed towards commercial farmers including specialized producers of cash and export commodities.
- Slightly over 33% of the extension resources were devoted to vast majority of smaller, marginal farmers.
- Not all extension is directly related to agricultural knowledge transfer.
- Extension personnel in developing countries spend about one quarter of their time on non-educational activities. In general, government staff may be engaged in a variety of local government servicing activities, as well as responding to information (requirements) requests, such as crop forecasting, census taking, from extension or ministry headquarters.
- In commodity programs, extension workers may spend a considerable time helping farmers to acquire inputs, credit and marketing services.
- Between years 1959–80, spending in real terms for extension grew more than sixfold in Latin America, tripled in Asia, and more than double in Africa (World Bank 1990). However, this trend started declining with the dismal failure of the T&V system in many developing countries. In many instances major trends and shift in extension have been induced by changes in the economic, political, technological, socio-cultural and fiscal environments for extension.

Based on different experiences, a number of generic problems were identified.² These include:

Scale and complexity

The scale and complexity of the extension task can be understood in terms of numbers, distribution, and diversity of staff, farmers and other clients and stakeholder and in terms of mandate and methodology.

Scale: The success of extension depends on individual farm management decisions of millions of people:

- Globally 800 thousand extension workers serve 1.2 billion clients (Swanson et al. 1997);
- Farm population is widely dispersed in many instances (especially in developing countries) and difficult to reach (Chambers 1983);
- Clients generally have a low level of literacy and formal education, and live far from information sources;
- Clients have specific needs depending on their natural habit, culture, farming/production systems and gender (Zijp 1998).

The main manifestation of the magnitude of this problem is coverage. Many public services are reaching only 10% of the potential clientele, a majority of whom are men. The most common response to the coverage problem has been to establish relatively large, hierarchical, centralized public-sector structures, with large number of extension agents widely dispersed in the rural areas, where their work is not easily observed or checked. This arrangement is not amenable to participatory, bottom-up approaches, and the many layers in the hierarchy remove decision-makers from the field action. An inherent tension exists between creating a strict hierarchy capable of managing such a large system and being accountable to farmers of all strata.

2. This section and the following one are heavily drawn from the article, *Agricultural extension: Generic challenges and the ingredients for solutions* by Feder et al. (2001).

Complexity: Involves the diverse sources of farmers' agricultural information and advice multiple stakeholders and partners in the agricultural development effort and the range of extension mandate. The variety of communication forms—such as individual farm visits, farmer-to-farmer extension, use of mass media, and most recently, computerized information technology—adds to the complexity.

Dependence on the wider policy environment and other agency functions

The effectiveness of extension in many low income countries is highly contingent on relaxing wider barriers to the successful development of the agricultural sector as a whole, including such potentially limiting factors as credit, technology stock, input supplies, price incentives, institutions and human resource constraint (Purcell and Anderson 1997). Institutional frameworks and agricultural policies may:

- discriminate against the rural sector
- underinvest in technology development and maintain inappropriate agrarian structures
- discriminate against private sector initiatives in food marketing and fail to maintain existing or invest in new rural infrastructure.

Lack of access to resources and the inefficient operation of complementary agricultural services limit the impact of extension. Coordination and links with complementary agricultural services are key problems for extension organizations, especially the links with research, input supply systems, credit and marketing organization (Axinn 1988).

Inability to trace cause and effect

The difficulty of tracing the relationship between extension input and its impact is another generic issue that is faced by extension. This has further implications including political support, budget provision and accountability.

Evaluating extension's impact involves measuring the relationship between extension activities and changes in:

- 1 Farmers' awareness, knowledge and adoption of particular technologies or practices;
- 2 Farm productivity, efficiency and profitability; input demand and output supply.

These same indicators are also influenced by many other factors that have confounding effects. Sophisticated econometric studies are needed to identify the exact contribution. Unavailability of time series data and inability to compare subject and control is another difficulty confronting analysts. Farm level studies are vulnerable to problems of self-selection, grateful testimony and the prevalence of inter-farmer communication. When extension indicators are more sophisticated and higher level (related to the development goals), the cost of collecting information is also higher, and it is more difficult to prove causality between the selected extension activity and changes in farm income and welfare.

Commitment and political support

Lack of commitment by senior government officials has been cited as a factor adversely affecting implementation of funding support in nearly half of the World Bank assisted free standing extension projects (Purcell and Anderson 1997). Government failure to allocate necessary funds to run extension system is one key indication of such lack of commitment. Urban bias and poor understanding of the role of rural information is another factor contributing to lack of commitment. Relatively low-cost, flexible administrative instrument to help disadvantaged groups with multi-functional services, are gaining wider acceptance in the process. Moreover, both 'push' and 'pull' factors operate at the field

level. The 'push' is the temptation for other agencies to use extension because it is the most widely distributed apparatus for contact with rural communities. The 'pull' is that the agents are willing to take on other duties, especially input distribution, because such tasks often increase an extension agent's influence over farmers, as well as providing opportunities to extract rents which compensate for low salary. Both have implications for the effectiveness of the extension service.

Operating resources and fiscal sustainability

Inadequate public funding has been a historic problem confronting the service delivery function of extension. According to Antholt (1994), the T&V extension system actually exacerbated operational funding problems by increasing staffing, and typically cost 25–40% more than multipurpose extension (Feder and Slade 1993).

Much information disseminated by extension is a 'public good', and dissemination costs cannot be easily recovered from individuals. Thus there is direct dependency on direct public funding. Fixed cost for salaries is very high, and operating costs are treated as a residual, which makes them vulnerable in a budget shortage. If the government has to cut the operating budget, there are obvious consequences for effectiveness if extension agents cannot get to the field, causing operational as well as moral problems (Axinn 1988).

Interaction with knowledge generation (Research–Extension, Extension–Farmer linkages)

Insufficient relevance of new technology necessary to improve productivity is one of the most common constraints in extension, and a major constraint in rainfed, resource-poor environments (Axinn 1988; Purcell and Anderson 1997). The inherent problem is that extension disseminates information and advice generated by a knowledge-generating system which is generally not under extension management. Very often research and extension tend to compete for power and resources, and fail to see themselves as part of a broader agricultural technology system. This is further aggravated by donors in many circumstances. Kaimovitz (1991) identified the following obstacles to effective research–extension links:

- Historical perceptions: Policy makers still fail to recognize research and extension as closely interdependent activities. The generally higher status of researchers tends towards patronizing behaviour that is resented by extension agents.
- Resistance to coordination: Coordination is perceived as limiting autonomy by both sides.
- Goals may differ: The two organizations may not share the same goal. Researchers are more interested in producing scientific papers, and therefore may not generate research relevant to farmers. On the other hand, extension agents may be more rewarded by distributing inputs and credit.
- No pressure: Lack of effectively organized outside pressure groups, such as national policy makers, donors, farm organizations, or private companies may hamper cooperation.

Some of the mechanisms tried by selected countries in Eastern and Southern Africa (ESA) to enhance research–extension linkages are summarized in Table 2.2.

Generic problems cannot be seen in isolation. They are interrelated and often represent conflicting imperatives. Pressures may exist to maximize coverage while minimizing costs, to emphasize firm management control while ensuring bottom–up participation, and increase human resource competence while exploiting cost-saving potential of mass media (World Bank 1990). Kaimovitz (1991) recorded that low salaries, limited operating resources, an unclear mandate led to general decline in morale. This

is further aggravated by difficulties in supervision, low quality extension work; higher staff turnover and lower credibility. These problems make it more difficult for extension to obtain resources. The crisis in extension directly affected relations with researchers who, perceiving extension as ineffective, became reluctant cooperators.

Table 2.2. *Mechanisms adopted in ESA to enhance research–extension linkages*

Country	Mechanism
Uganda	Research Extension Liaison Unit (RELU) within NARO; joint diagnostic surveys and implementation of on-farm research; joint technical workshops, joint planning and development of recommendations; joint technical publications; joint field visits, study tours, open days and agricultural shows; research; program planning review committee
Swaziland	Informal linkages through a team of subject matter specialists
Ethiopia	Research–Extension Liaison Officer at each station; Research–Extension Liaison Committee at each zone
Kenya	National Farming System Coordinating Committee (NFSCC); National Research–Extension liaison committee (NRELC); Regional Research–Extension Advisory Committee (RREAC); District Farming Systems Team (DFST); Research–Extension Liaison Officers; joint diagnosis; joint planning and execution of activities; field days; joint recommendations; joint training; memorandum of understanding between Ministries
Zimbabwe	National level committee for on-farm research and extension; various subcommittees to look at commodities jointly to vet proposals; more functional relationship at the local level; regional committee for on-farm research chaired by extension or research
Botswana	No formal mechanisms, but collaborate in field level activities; joint diagnosis and planning
South Africa	Sustainable Rural Livelihoods Unit in Agricultural Research Council
Malawi	Research liaison officer in the department of Agricultural Research; FSR teams located within the agricultural development division
Tanzania	Zonal Technical Committee; Zonal Advisory committee; Annual Internal Program Review at the Zonal level; on station field days; on-farm research activities at village and district level; bimonthly extension–research workshops; regional coordinating committee meetings; Zonal Communication Centres

Source: Anandajayasekeram and Stilwell (1998).

2.3.1 Overcoming generic problems—experience and promise

A range of institutional innovations have emerged over the years to address these generic problems. Overtime, however, the emphases of these innovations have changed, but still offer promise.

Improving extension management

The T&V system of extension system was used as an example of improving management of extension services. Starting in the late 1960s, T&V has been implemented or tried in the national systems of many countries. It was the system employed in 90% of World Bank agricultural extension projects reviewed by Purcell and Anderson (1997).

To be effective, the designers of T&V stressed that certain key features had to be preserved—professionalism, a single line of command, concentration of effort, time bound work, field and farmer orientation, regular and continuous training, and close links with research (Benor et al. 1994). Over the years many adaptations have evolved. The design also called for village extension workers (front line staff) to advise farmers on prices, availability of necessary inputs and market conditions as well as report on actual availability and farmer responses to supervisors. This would have allowed for adjustment in extension instructions.

Accountability was to be provided through the tight line of command supervision and the strict timetable of contact farmer group visits. Exclusive devotion to information dissemination task relieved staff from the 'push' and 'pull' to do tasks that are not related to agriculture or extension. T&V designers attempted to resolve the problem of interaction with technology generation by structuring research-extension links involving regular training (monthly and fortnightly workshops) and continuous feedback of farmers' problems.

The T&V approach also faced some of the generic problems identified earlier. The contact farmer coverage method frequently faced problems because contact farmers were not representatives of the farming community (Nagel 1977). Strict scheduling enabled closer checks on what field staff were doing and improved monitoring, but it has not resolved the problem of relating input to impact. The dependence on the other rural development factors to generate impact could not be eliminated, and the independence status that the extension system received under T&V initiatives did not help to resolve coordination problems with other programs. The relative abundance of resources also created additional problems with the research systems. There also remained a tendency to neglect participatory aspects, and accountability to farmers was not established (Axinn 1988). T&V's most obvious disadvantage has been its 'highly questionable sustainability' (Antholt 1994) as a nationwide system due to substantially increased staff allocation and recurrent and operational costs (Axinn 1985). Currently most countries in sub-Saharan Africa have moved away from T&V system of extension, but some elements are still maintained.

Decentralization

Decentralization has been described as 'the first step on the long road to privatization'. Because diversity becomes more tangible and different approaches to extension can be explored as the local level becomes accessible (Ameur 1994). Decentralization is expected to make extension services more flexible and relevant to the needs of intended beneficiaries. It is also likely to encourage the establishment of procedures for the formation of farmer associations, cooperatives and other types of groups that can eventually take up the responsibility for the financing or delivery of extension services (Rivera and Schram 1987). Decentralization includes administrative and political-fiscal devolution of program and funding decision and staff accountability to local units.

Three, often overlapping, extension reform strategies currently dominate the agricultural extension systems (Rivera 1996).

1. Decentralize the burden of extension costs through fiscal system redesign. 'Fiscal federalism' is considered central to more efficient and equitable provision of public services such as agricultural extension as well as for greater participation of local government in the processes of financing and managing such services. This involves:
 - direct charging of extension services (OECD countries)
 - voucher system where small farmers are provided with coupons or vouchers, which serve as tender for them to command the services of private agricultural extension consultants.

Overall there is a downward trend in the relative share of government support since 1970.

2. Decentralize central government responsibility for extension through structural reform. Here:
 - Responsibilities shifted from central to subgovernment institutions with the idea of improving institutional responsiveness and accountability (Antholt 1994)
 - Strategies include: decentralization, devolution, delegation and transfer of responsibility to the private sector for agricultural extension (Rondinelli 1987).

- Decentralization is the transfer of effective control by central agencies to their field level offices;
 - Devolution means that effective control is transferred to subnational governments;
 - Delegation takes place when a subnational government or parastatals act as agents of central governments in the implementation of agricultural extension functions;
 - Transfer of authority to the private sector involves selling or shifting services to the private and third sectors such as NGOs, cooperatives and community organization;
 - Another structural strategy is ‘deconcentrated dual authority’ whereby authority is shared by the governments with farmer associations (used in Taiwan, South Korea, Norway and Sweden).
3. Decentralize the management of programs through farmers’ participatory involvement in decision-making and, ultimately taking responsibility for extension programs. The participatory involvement is thought to make services more responsive to local conditions, more accountable, more effective and more sustainable (World Bank 1995). The basic rationale for decentralizing the management of extension is the argument for farmers’ participation and greater use of local expertise for program development. The advantages of using local expertise are capacity building, cost-effectiveness and greater familiarity with local context (Zijp 1994). By getting closer to the users, a decentralized system may develop superior information channels, foster greater equity, and improve management and resource allocation systems.

These three broader strategies are complementary, and may be distinguished in terms of market based privatization and non-market based decentralization strategies (Smith 1997). While non-market-based decentralization strategies tend to enhance subgovernment responsibility for extension, market based privatization strategies involve private enterprises development or coalition with diverse private entities.

During the past quarter century, the work of extension services has often become more diversified. In the less developed countries, the main focus remains on agricultural production, but there has been a growing recognition of the need to reach, influence and benefit the multitudes of small, resource-poor farmers. Now agricultural extension has become recognized as an essential mechanism for delivering information and advice as an ‘input’ into modern farming. Since commercial farmers can derive direct financial benefits from these inputs, there is a trend towards privatization of the extension organizations, often as parastatals or quasi-governmental agencies, with farmers being required to pay for services which they have previously received free of charge. This trend is strong in the north, and there are examples of it beginning in the south.

Specifically, the major factors affecting the effectiveness of decentralization are:

- The extension of an elected representative local government and a central government willing to actually decentralize;
- The ability of local governments to raise revenue; and
- MOA capacity for efficient quality control and monitoring (Garfield et al. 1996).

In addition, a number of actions have to be taken to facilitate decentralized systems. This may include building local capacity for farmer involvement in extension programming, housing extension agents locally and making them responsible to farmers’ associations, and designing resource mobilization and funding mechanisms.

If properly implemented, these actions can contribute to resolving a number of generic problems identified earlier:

- The scale and complexity problem is reduced in proportion;
- Extension's dependency on other agency functions is reduced because of the potential for better interaction with other local initiatives;
- Commitment and political support, along with responsiveness (an aspect of accountability) are enhanced if the local government is democratic;
- To some extent, this circumvents the inability to relate cause and effect because client satisfaction is in the interest of the locally elected government.

It is also worth noting that this may enhance the scope for local political interference in technical matters. Technology generation is cited as another weakness of the decentralized arrangement especially if the technology generation system is not decentralized.

A good example is Columbia which decentralized extension to municipalities (Unidad Municipal de Asistencia Técnica Agropecuaria—UMATA), which has improved coverage, accountability and possibly responsiveness. However, the process also complicated staff and program quality control (monitoring and accountability), exacerbated political interference at the local level, interrupted research–extension links, and increased staffing and local costs roughly in proportion to the increase in coverage.

Another example is Venezuela which subcontracted a university or NGO to provide an extension team in each of the five pilot municipalities. The main project decentralized planning and implementation of extension to the municipal level; forms farmers' associations to administer the municipal extension service; contracts private extension consultants, NGOs and universities to manage the extension service provisions; and provides for cost-sharing between national, state and municipal levels of government and beneficiaries themselves.

Single commodity-focused extension

Commodity-specific extension has been practised across the public, parastatals, private and social sectors, including agro-processing and marketing firms and farmers' associations (Umali and Schwartz 1994; Nagel 1997). The focus is often on one commercial or export crop linked to established marketing or processing outlets, or on one aspect of farming such as livestock (Axinn 1988; Purcell and Anderson 1997). The distinctive feature of commodity specific extension lies in vertically integrating most of the components of the production and marketing systems; including research, input supply, product marketing, credit, extension, and sometimes price assurance. This approach addresses the generic problems of dependency, complexity and scale, as well as the problem of relating cause and effect. Staff accountability is readily assured by uniform salary, training and staff conditions of services. The small and focused approach is relatively cost effective, and through levies on product sales or by factoring cost recovery into product or input prices; fiscal sustainability is achieved. Finally almost by definition the vertically-integrated structure assures a 'technology fit'.

Agro-processing and marketing firms (including input suppliers) provide extension services to their farmer suppliers to reduce input supply risks, reduce postharvest losses and improve quantity, quality, consistency and timeliness of output. In the agro-processing and marketing operations, extension services are typically an integral component of contract growing schemes in producing high-value commodities.

The commodity approach has inherent limitations (Nagel 1977):

- In situations where farming is not a monoculture, the approach does not fit as well because the narrow commodity focus tends to leave the rest of the agriculture sector and the extension system with many unaddressed needs.
- Because of the limited focus, scale and coverage, other public service functions, and issues relating to the interaction of the commodity with other components in the smallholder production systems are neglected (Purcell and Anderson 1997).
- Accountability to farmers is questionable unless the commodity organization is controlled by farmers' associations (Axinn 1988).

Fee-for-service public provision

Introducing user charges or fee for service is an approach some public extension services have adopted and is primarily a cost-recovery strategy. Farmers pay a portion of the fees, but the government also pays on a contract basis. In some instances, commercialization is a transitional stage towards privatization. The issue of fiscal sustainability and accountability are the primary generic problems addressed by this approach. This approach can also bring about a more professional, client-oriented relationship between extension agent and farmer, thus improving both accountability and efficiency.

Positive impact on the scale (coverage) problem is only obtained if the introduction of user charges is accompanied by stratifying the client market and arranging special services for less commercial farmers. In the absence of such protection, fee-for-service extension would likely exacerbate the generic problem of coverage in low-income countries.

For example, commercialization experiences in UK and New Zealand resulted in reducing the public fiscal burden, improved accountability and ability to trace cause and effect by involving extension staff in the entire production–processing–transporting–marketing chain. It also shifted towards a stronger client orientation and a concern to identify and produce results rather than simply engage in activities. The UK Advisory Services (ADAS), for example, increased efficiency and reduced cost to government, brought about high job satisfaction for the majority, and created a more professional relationship with customers, and has a better focus (Feder et al. 2001).

In both cases interaction with knowledge generation and coverage of small farmers has been a concern. Interaction among organizations diminished and feedback from farmers to science providers declined. Howell (1988) and Rivera and Cary (1997) noted the limited scope for funding public extension services by user fees in developing countries.

Implementation issues in this case are:

- Collecting user fees, establishing cost-accounting procedures and reorienting and retraining extension staff;
- In subsistence economies, using charges for 'common goods' in general extension information would be difficult to enforce and possibly reduce general participation in extension (Howell 1988). The demand for such services will almost exclusively come from market-oriented farming operations, particularly from areas dominated by medium to large-scale farmers. Partial cost recovery may be a means of fostering a more demand-driven system and serving as an important transitional phase towards developing a market for fee-for-service extension. Cost recovery and user co-financing components have been incorporated into a number of projects in many countries in Latin America (Chile, Mexico, Venezuela and Nicaragua).

Wilson (1991) described how cost reduction in Mexico is achieved partly by stratifying the client market by income level and either progressively graduating higher-income producers to private extension services or requiring greater cost sharing—releasing public resources for an ‘extension safety net’ targeted at low-to-middle-income producers in priority areas (Umali-Deininger 1996).

Institutional pluralism—Mobilizing other players

The objective here is to create a more pluralistic system of complementary extension services that would reach and respond to diverse farmers and farming systems (World Bank 1997). The emphasis here is moving more towards private provision.

By involving a variety of stakeholders in forging contracts and collaborative partnerships, pluralistic arrangements have the potential to help resolve two fundamental generic problems—linking cause and effect, and accountability or incentive to deliver quality service. In subcontracting arrangements, the provider’s client orientation is strengthened through the contracting process and the farmers’ influence as a fee-paying customer increases. Accountability tends to be multifaceted, with several stakeholders involved in developing contract terms of reference, competitive bidding and direct input from the farmers in the design of indicators. Involving nonprofit NGOs may further improve responsiveness, cost-effectiveness, and equity in coverage.

The difficulty of institutional pluralism is for central governments to adjust to a position of reduced direct control over either program or staffing. Additionally, financial and administrative management may increase in complexity, at least initially, as new systems are developed. Additional resources and efforts may be required to monitor service quality.

If we can overcome some of these initial difficulties it can resolve the problem of coverage, ability to relate cause and effect, accountability, fiscal sustainability, and interaction with knowledge generation. Key principles (Zijp 1998) that underpin this innovation include:

- delinking public funding from public delivery
- change in governance
- involvement of new institutions and institutional arrangements, such as public–private partnerships
- open and democratized extension control so that all stakeholders may express their perspectives and interests, and play appropriate roles in extension design, implementation and evaluation
- increased investments by the government in the whole agricultural knowledge and information system (AKIS) rather than public sector extension service alone, in order to meet the diverse needs and conditions in the farming sector
- changes in the role of public sector/government; moving away from service delivery towards providing an enabling policy environment, coordinating and facilitating the work of other players and assisting farmers in negotiating terms of contracts, monitoring quality and exercising financial control.

Public involvement may fund, staff or facilitate extension by establishing conducive regulations and policies for other providers and it may pursue a range of purposes.

The approaches used include:

- Contracting— Morocco, Estonia, Turkey, Madagascar, Costa Rica and Mexico.

- Coupons to agricultural bank loans (committing a certain percentage of the loan to extension services)—Columbia.
- Extension vouchers—Costa Rica and Nicaragua.

Experience of vouchers in the education field (West 1996) suggested that administrative costs might be substantial; threatening the sustainability of the voucher system as a whole.

Co-financing in Ecuador and Honduras aims to replace the public extension services with a ‘technology transfer market’ financed jointly by government and beneficiaries, in which private agent will compete to provide services. Both cases involve stratification of farmers with small, medium and large scale producers, with separate programs and graduated scales of co-payment designed for each farmer category.

Collaborative arrangements with the NGOs and nonprofit sector include cooperative arrangements with universities, commodity boards and commodity foundations (Umali and Schwartz 1994; Nagel 1997). Many NGOs strive to be participatory, democratic, responsive, cost-effective and community-based, and focused on needs of hard-to-reach target groups. However, some NGOs push their own agenda and are more accountable to external funding sources than the clientele they aim to serve (Farrington 1997).

The most successful innovations in technology generation and transfer involve effective partnerships among institutions, whereby NGOs, farmer groups, research and extension agencies are working together collaboratively in the technology development processes. In addition, the efforts encompass effective and full participation and empowerment of farmers and communities. In these efforts, growers, researchers and extensionists work within next organizational relations, learn together about principles of agro-ecology, blending knowledge and a variety of techniques, rather than being given fixed technological packages and inputs. Knowledge and communication flows among these groups in two-way directions.

Empowerment and participatory approaches³

A number of participatory approaches through formal and informal farmer groups have been tried to enhance the effectiveness and efficiency of the R&D system. Participatory approaches have positive effects for most of the generic problems of extension.

- With respect to scale and coverage, participatory approaches produce farmer leaders with appropriate local backgrounds, including women, who are able to perform many extension agent roles in a cost effective manner (Russell 1986; Axinn 1988).
- Participatory approaches have been found to adjust complementary services more closely to farmer needs (Axinn 1988) as well as farmer dependence on external inputs (Röling and Pretty 1997).
- Farmers’ unions in Europe improved the integration of complementary service and raised political support (Röling 1986).
- Participatory approaches also have a positive effect in terms of tracing cause and effect through farmer-led experimentation and analysis and farmer feedback (Axinn 1988).
- A key positive impact of participation is accountability.
- Automatic quality control is achieved through raising farmer awareness and confidence.
- The quality of trust established (Pretty and Simplicio 1997) and ownership (Chamla and Shingi 1997) are also emphasized.

3. The participatory extension approaches for research for development are discussed in another section of this source book.

- Fiscal sustainability is improved through mobilizing local resources. Cost-effectiveness and efficiency are achieved by using relevant methods that focus on expressed farmer needs and local people taking over many extension roles (Axinn 1988).
- Participation has positive effects on the interaction with knowledge generation by combining indigenous knowledge with feedback with the agricultural knowledge system (Axinn 1988; Chamala and Shingi 1997).
- Often decentralization is virtually a prerequisite for effective local participation.

Privatization

The term privatization is used in a broader sense of introducing or increasing private sector participation, which does not necessarily imply a transfer of designated state-owned asset to private sector. In its pure sense, privatization implies full transfer of ownership (usually by way of sale) from government to private entity, with that entity meeting all costs and receiving any profits (Rivera and Cary 1997). This is not the case with the privatization of extension.

The private sector has the incentive to provide private and toll-good information to 'better off' commercial farmers and members of private associations for whom extension service delivery is profitable. In areas dominated by commercial farming and farmers with marketable output, it makes sense to mobilize the private sector to provide investment capital and services (World Bank 1997). However, fully privatized extension is not economically feasible in countries with a large base of small-scale subsistence farmers (Umali-Deininger 1996). In such circumstances, public sector finance remains essential, mixed with various cost recovery, co-financing, and other transitional institutional arrangements that are appropriate to the pace of structural and commercial changes in agriculture. It is worth noting that all privatization efforts report improvements in accountability, usually expressed in terms of client orientation and satisfaction.

All privatized efforts claim improved efficiency, cost-effectiveness and reduced public sector costs by servicing the needs of farmer clients who can afford to pay for the information, thus overcoming the problems of sustainability and dependence on fiscal allocations. Incentives exist for private providers of extension to maintain close links with knowledge generation agencies in order to have a marketable product. However, over reliance on private extension risks neglect less commercial farmers and lower-value crops. Stratification and separate publicly funded targeted programs are needed to counter this risk.

Privatization also does not deal with the complexity of providing a socially and environmentally optimal service. Most analysts suggest a continuous, evolutionary approach to privatization within a clearly formulated mission and strategy along with open communication among all stakeholders. Start with more commercial farmers for whom the technology package already exists and extension is largely a delivery function or begin in a single region and expand over time; bringing farmers to a point where their future extension needs are met by private sector services or provided on a fee-paying basis, leaving the public service to serve new clientele and cropping systems including more marginal groups (World Bank 1990). For example, Chile completely privatized in the 1970s. As a result, small-scale subsistence farmers were left out of the extension market. The government started targeted programs (one group paying 15% of extension cost, one going up to 50% and the other starting from free basic services with a proposed eventual contribution of 15% of total cost). Where services were delivered by contracted private consulting firms, to qualify for this program, a firm needed to meet technical and professional staffing criteria, bid for contracts, and agree to have its activities supervised and evaluated by designated public agency.

Privatization has been attempted by a number of countries such as Albania, Argentina, Brazil, Columbia, Mexico, Uruguay, Korea and Taiwan. Schultz et al. (1996) recorded that although privatization facilitated transfer and adoption of technology, reduced government funding also created competition rather than cooperation within the knowledge system, hampering communication with research, education, farmer organizations, private consultants and supplies.

Contracting of services

Both contracting 'out' and 'in' are being used as alternative strategies. In many countries such as Jamaica, Uganda and Mozambique, donor projects and NGOs hire well-known, public extension advisors to help provide services. In such cases, i.e. contacting 'in' extension workers are provided operational funds, travel allowances, per diem and in some cases salary supplement to augment low civil servant wages. This is a form of private sector contracting public-sector extension staff. Other examples of contracting 'in' for extension services exist in middle-income countries such as Israel, where farmer organizations contract with public sector extension for specialized services. In contracting out extension delivery, public funds are used to contract private service providers (e.g. for-profit companies, extension consultant associations, and nonprofit non governmental organizations). Anticipated benefits of such arrangements include:

- greater operational efficiency and cost-effectiveness
- greater accountability of extension to perform and produce results
- greater variety of providers of extension services.

When the publicly financed extension services are contracted out, the role of government changes from that of implementing agency, to that of quality controller, overseer and provider of training and technical information to agencies contracted. In low income developing countries, the inclusions of private sector entities in the extension delivery process is thought to hold great promise for the advancement of pluralism, democratization and institutional efficiencies.

Some of the commonly used reforms in the provision of agricultural services are summarized in Table 2.3. The various approaches used in selected countries in eastern Africa are summarized in Table 2.4.

Table 2.3. *Types of key reforms in the provision of agricultural extension services*

Reform	Brief description
Pluralism	Emergence of multiplicity of actors providing services, either autonomously in response to farmer demand or facilitated by government policy measures
Decentralization: de-concentration and devolution	Locating decision-making, management authority and accountability closer to the field level within public sector structures (de-concentration), with the aim of making extension more flexible and responsive to client need and demand. This may or may not be linked to local government reform (as in Uganda and the Philippines) where the funding and provision of extension becomes a matter for local government structures rather than central government departments (devolution)
Cost-recovery	Public sector service recoups some of the cost of service provision from clients, in user fees from individuals or farmer associations
Commercialization	Public sector service put on a commercial and semi-autonomous basis, responsible for meeting a (rising) proportion of its costs from client fees and with greater freedom than a government department in matters relating to personnel and contract negotiation, and in the re-investment of income
Privatization	Public sector service transferred or sold to the private sector. Government may continue to provide (some) funding through contract arrangements

Extracted from: Mulhall and Garforth (2000).

Table 2.4. *Various approaches of extension services in selected countries in eastern Africa.*

Country	Extension service strategy adapted
Kenya	Much of the history of extension in Kenya is beset with examples of top-down, transfer-of-technology models of technology dissemination, many following the theory of diffusion of innovations
Ethiopia	<p>Starting from 1991, the T&V extension approach was adopted as a national extension system until its replacement by the Participatory Demonstration and Training Extension System (PADETES) in 1995. The major objectives of PADETES include: increasing production and productivity of small-scale farmers through research-generated information and technologies; empowering farmers to participate actively in the development process; increasing the level of food self-sufficiency; increasing the supply of industrial and export crops and ensuring the rehabilitation and conservation of the natural resource base of the country. Currently PADETES promote packages on cereals, livestock, high economic value crops, improved postharvest technologies, agro-forestry, soil and water conservation and beekeeping developed for different agro-ecological zones</p> <p>Extension activities are the entire responsibility of regional agricultural bureau. The extension division of the federal Ministry of Agriculture has the task of coordinating inter-regional extension work, providing policy advice on nationwide agricultural extension issues, advising regional bureau of agriculture in the areas of extension management and administration, developing extension training materials and organizing training programs in agricultural extension for regional extension personnel. The regions are given full autonomy in the planning, execution, monitoring and evaluation of extension programs</p>
Uganda	Decentralization of services to lower levels. The provision of extension services is largely the responsibility of district authorities. At the national level, extension is coordinated by the Ministry of Agriculture, Animal Industry and Fisheries (MAAIF). The ministry undertakes pre- and in-service training of extension staff. The Directorate of Agricultural Extension (DAE) integrated into the regular organization framework of MAAIF; periodically makes field visits to give guidance to district extension staff on technical and extension methodological issues. At the district level, extension services are headed by a district extension coordinator and at the country level, extension services are overseen by a Country Extension Coordinator (CEC) who supervises and guides field extension workers who are the grassroots personnel in regular contact with farmers. Village level participatory approach and farmer to farmer seed multiplication are also implemented in the country
Tanzania	According to the local government Act of 1977, the delivery of public extension in Tanzania is now vested with the local governments. The intention is to have extension service administered at the lowest level of government for better accountability where it is believed; active participation of beneficiaries and other actors can be more effective. District Agricultural and Livestock Development Officers (DALDOs) are in charge of extension service delivery in their districts. They report to their District Executive Directors (DED). As far as agricultural extension is concerned, the role of the Central Government, namely the Ministries of Agriculture and Food Security (MAFS) and Water and Livestock Development (MWLD), is to facilitate and support Local Government Authorities (LGAs) in carrying out extension services. This is done by providing on-the-job training to extension staff, providing transport facilities, guidelines, regulations and coordination in general.

Source: Authors.

The other advances in extension include the following:

Inter-connecting rural people and using appropriate media

Extension organizations in developing countries have two major problems when it comes to having face-to-face contact with farmers and researchers: first, physical distances, and second, lack of transportation facilities. The new information technologies could bypass these physical barriers to a great extent through the development and application of appropriate, interactive information mechanisms.

‘Interconnectivity’ describes the use of appropriate information and communications technology (IT) to enable people to connect with other people (Zijp 1998). To harness its full potential requires considerable commitment and some radical changes in perspectives. One change is to lessen our reductionist—sectoral orientation in favour of a pluralistic, cross sectoral systems perspectives.

Thus, inter-connectivity is closely interrelated to decentralization and institutional pluralism. New partnerships will emerge for local information access, communication and education in rural areas. They are as diverse as the communities they serve, but many are self-financing after initial start-up, and they all shift control and accountability to focus on information, educational and organizational needs of the community.

The arrival of the information age has naturally led to an interest in its potential for innovative applications of the latest communication technologies (IT) to enhance extension delivery. Information and Communication Technology (ICT) comprises various techniques and infrastructure for storage, processing and management of information. These include computers, software, books, personal digital assistants (PDAs), digital and non-digital libraries and different communication channels such as mail and email, radio, television, telephone, mobile phone, pager, instant messaging, internet etc. The application should be considered along with the more traditional extension methods such as mass media, group meetings, field days, demonstrations and exchange visits. Innovations in this category are most directly associated with overcoming the generic problems of scale and complexity through cost efficiencies associated with certain mass media, contributing to fiscal sustainability.

A study by Wete (1991) revealed that the most traditional approach, print with graphics and radio, as most appropriate and cost-effective in a developing country. Zijp (1996) concluded that cost effective use of IT is achieved only at significant initial and operating costs. Further, this impact tends to occur when the media are used in combination with other innovations, indicating that it is best considered not in isolation, but as a 'force multiplier' enabling or enhancing the effectiveness of other innovations and conventional extension methods (Antholt 1994). It is also worth noting that the suitability of different media depends upon the message, target audience and social environment. Radio and television are more appropriate for reaching many people quickly with relatively simple ideas, while print media are better suited to provide timely reminder of information. Interpersonal communication, including extension agents, group meetings, and demonstrations are best suited for teaching and enhancing credibility of information. Based on Lionberger's (1968) model of adoption process, Campbell and Barker (1997) recommended:

- Mass media and popular theatre to provide new or additional information in the 'awareness stage';
- Group meetings, radio and field days to increase knowledge in the 'interest' stage;
- Result and methods demonstrations, and farmer exchange to improve skills in the 'evaluation' stage;
- Individual visits, farmer exchange, on-farm trials, and method demonstrations to induce behavioural change in the 'trial' stage; and
- Recognition programs, competitions and incorporating practices into farming systems to consolidate attitudinal changes in the 'adoption' stage.

Wete (1991) pointed out some limitations of excessive dependency on information technologies:

- Information alone is an insufficient condition for social change;
- Far from being neutral, provision of information can actually widen the gap between the rich and poor;
- Communications technology (CT) does not have to produce effects without government commitment to change, reflected in its provision of budgetary support and conducive policy and complementary services; and
- Most developing countries cannot afford CT hardware costs; as a result the benefit/cost ratio of

some CT applications is doubtful.

It is worth noting that IT by itself cannot overcome the problem of relating cause and effect and in terms of coverage, IT cannot replace face-to-face contact between extension agents and farmers. Nevertheless, increased investments in many IT applications appear to make sound economic and social service, and deserve public sector support (Zijp 1998).

In many countries, erstwhile emphasis on using vernacular press, radio and TV for reaching to farmers is being augmented with the use of state-of-the-art communication technologies such as internet and satellite communication. Connectivity is being exploited to facilitate a two-way communication among all the stakeholders in the Research–Extension–Marketing–Farmers loop.

India has been experimenting with cyber-extension in pilot areas. This means ‘using the power of online networks, computer communications and digital interactive multimedia to facilitate dissemination of agricultural technology’. It includes effective use of ICT, national and international information networks, internet, expert systems, multimedia learning systems and computer based training systems to improve information access to farmers, extension workers, research scientists and extension managers. This is not intended to replace the existing systems of communication but only to add more interactivity, add speed, add two-way communication, add to wider range and also more in-depth messaging. This is expected to widen the scope of extension, add to the quality, subtract costs, reduce time and reduce dependency on many actors in the chain of extension system.

It is to be noted that this development will not make extension workers redundant. Rather, they will be able to concentrate on tasks and services where human interaction is essential—in helping farmers individually and in small groups to diagnose problems, interpret data and to apply their meaning.

Lao People’s Democratic Republic, Vietnam and Mali, are experimenting with ‘telecentres’. Virtual linkages are being established for bringing research and extension together, and one example is the VERCON (virtual extension, research and communication network) tool, which FAO has introduced in Egypt and Bhutan. Under an FAO project in the Philippines, the internet and interactive e-mail facilities have been established at municipality level for supporting decentralized extension staff. Expert systems are also being developed to compensate, to some extent, for the too-rare visits of subject-matter specialists to farmers’ fields. The use of cellular phones is by now a routine practice and the equipment is used for rural development projects in Bangladesh. Over 30% of extension staff in Estonia use the internet. One can find programs like ‘virtual gardens’ and ‘virtual farms’ on the internet. The main issue is how the powers of advanced information technology can be harnessed for the benefit of both extension agents and farmers without compromising the importance of unique local factors such as indigenous communication patterns, and also without considering information technology as replacement for the extension agents, which remains a much-needed and -appreciated human element.

In Russia, the approach taken to achieve this broad objective was a modular concept using Multi-media to develop and disseminate Multi-disciplinary information and knowledge from Multiple sources to Multiple users with built in user needs assessment and feedback mechanisms—in short the Four M modular approach for rural information and knowledge system (Figure 2.1). The multi-users were the newly emerging farm structures of various types, public and private institutions, communities, agro-industries, departments of agriculture; multi-sources were the local and international agricultural research institutes, universities and academies, input suppliers, producer organizations, agricultural

departments, foreign and local data banks etc. Multi-media consisted of print, TV, video, computer network, exhibitions and fairs etc. Multi-disciplinary consisted of laws and regulations, status and changes of reforms in various sectors, finance, economics, accounting, marketing, relevant technologies, environment etc (Janakiram 2004). This modular approach was designed to support an evolving, pluralistic knowledge based rural extension system (Rivera 2001; Alex et al. 2002) consisting of the following elements. The approach:

- Accelerates the transition process—recognizing the importance of diverse information and knowledge user needs;
- Transfers information and knowledge in an educational and training manner rather than through directives;

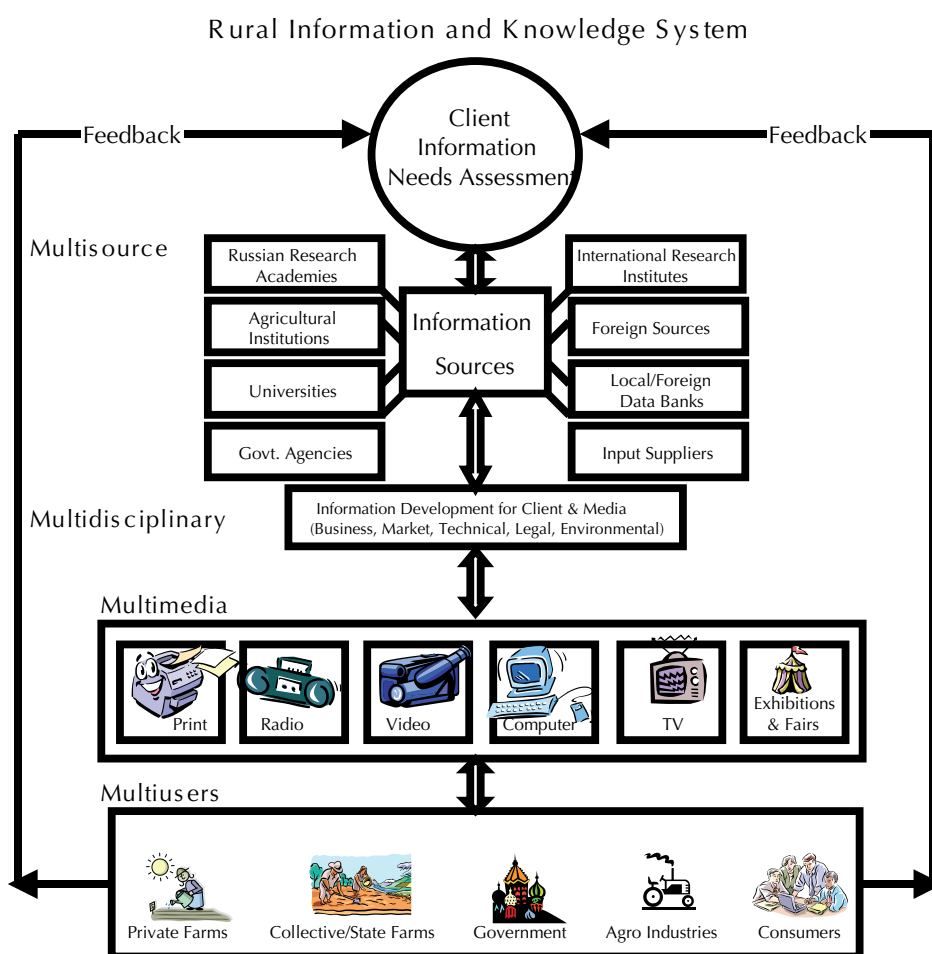


Figure 2.1. The 4-M modular system of ICT use in Russian agricultural extension.

- Sees the increasing importance of non-farm activities to supplement farm incomes especially for the emerging small private farmer;
- Creates strong linkages between education, research, and various forms of farming systems;
- Facilitates the evolution of diversified service providers consisting of contractual arrangements, public-private sector partnerships involving NGOs, producer organizations, association of private farmers, water user associations etc. (World Bank 1990)
- Creates a decentralized and localized extension program management and delivery;
- Allows all forms of media—from traditional to modern to play a role;
- Provides opportunities for creation of fee based rural extension services based on willingness and

ability to pay off the end-users;

- Depends for sustainability on continued, but declining, public support over time;
- Works in coordination with other providers of rural information and knowledge—such as health, education, micro and small enterprise credit, environment, eco-tourism etc.

Indian private and public sectors have developed various models for effective use of modern ICTs for agricultural advancement. The following paragraphs are drawn from Adhiguru and Mruthyunjaya (2004). Some notable examples are presented here.

Among the public initiatives is the Helpline service started by the Chandra Shekar Azad University of Agriculture and Technology (CSAUAT) in Uttar Pradesh in 2002. It operates through a toll-free, widely publicized telephone service. A panel of twenty-one scientists covering various disciplines of agriculture remains available to attend farmers' calls. The farmers can interact with this panel of scientists between 1300 and 1500 hours on all working days. It has been observed that on average 5–7 queries per day are received during this call period. This panel of agricultural scientists provides 'real time' information and helps them in proper and timely decision making. This service has reduced transaction costs for seeking information by about 94% and has helped farmers take correct decisions on farm-inputs and adoption of technologies in agriculture and allied areas. However, about one-quarter of the farmers stated that private telephone booths in the villages did not encourage making calls to this Helpline since it was a toll-free service. They had trouble due to the poor telephone infrastructure. A facilitator is required for creating awareness, utilization of Helpline service by facilitating access to the phone and information at the village level.

Gyandoot or a 'Village Information Kiosk' in Madhya Pradesh proved that it can be a self-sustainable enterprise (with potential to provide jobs for two young people at each kiosk). This was an instance where e-governance services integrated with the information network. The backbone for group access in this case has been the cooperatives.

Among private sector initiatives, most quoted has been the Soya-Choupal website floated by ITC, a large multi-national agro-industrial firm in India. This tool was designed to enhance ITC's efficiency in its procurement of soybean. Their portal in Hindi offers the latest information on weather, farming practices and market prices of soybean to farmers at the village level. Real-time information on market price of soybean as offered by ITC is provided. Farmers can compare ITC's price with that offered by other local traders and can take decisions about when and where to sell their farm produce so as to gain maximum profit. Thus, 'Soya-Choupal' as a direct marketing channel, virtually linked to the '*mandi*' (market) system, eliminates many intermediaries, and helps farmers realize multiple gains through better handling and thus improves sale value for the produce (about 2%). ITC gains through a better control over quality of produce and reduction in procurement cost by 2.5%. There is a *sanchalak* (coordinator) who aggregates the demand for farm inputs from individual farmers and extends help in procuring high quality inputs from reputed manufacturers at a fair price. The *sanchalak* gets a commission of 1% on the total value of the procurement under his facilitation and therefore, he spends more time and energy on the procurement for ITC.

Another initiative floated by a private industrial house is Ikisan. This is an initiative of the Nagarjuna group of companies, established in 2000 with the objective of facilitating continued enhancement of agricultural productivity and rural prosperity, and thereby making Indian farmers globally competitive. This initiative includes both the Ikisan portal and information kiosks at the block/village level for disseminating information. Farmers can access this portal free of cost. The portal has organized

information on agricultural practices, agricultural news, animal husbandry, agricultural machinery, aromatic and medicinal plants, agricultural credit, insurance and prices of inputs. It also provides dynamic information like marketing and weather. One has however to note the high establishment costs (about USD 670 thousand) and maintenance costs (about USD 6700 per month).

The most successful among NGO initiatives has been the Information Village Project of the MS Swaminathan Research Foundation in Pondicherry. This experience created a great impact and has now been adopted by the Government of India as a major component of its rural development strategy and is being scaled out to the rest of the nation. The system created consists of a value-addition centre (VAC) (hub station) at one place, which is connected to ten village knowledge centres through a hybrid wireless network comprising computers, telephones, VHF duplex radio devices and facilitating both voice and data transfer. The content for dissemination is prepared locally using indigenous knowledge combined with generic information, including experts' suggestions. Local volunteers, mostly women, gather the information and feed it into the intranet. Value is added to this information by preparing it in the local language (Tamil) and use of multimedia. The village knowledge centres disseminate this information using display boards, computers, public address system, paper-clippings as per requirements. For instance, weather forecasts for fishermen are translated into local language and broadcast over public address systems. Area-specific information related to crops, prices of agricultural inputs and outputs, healthcare, livestock care, transport, weather, government development schemes are provided. The value-addition centre has generated a number of database to answer local people's day-to-day queries. Rural yellow pages containing local advertisements are published. The facilitator in the village knowledge centre is motivated by adequate training and providing a token incentive of Indian rupee (INR) 1 (USD 0.02 cents) per visitor to the centre.

These village knowledge centres have encouraged community partnership tremendously. Gender sensitivity orientation and involvement of women volunteers have resulted in active participation of women and their empowerment. The proportion of women users varied from 34 to 50%. Creation of content locally and disseminating it in a user-friendly mode with state-of-the-art ICTs has led to extensive use of the initiative and a strong sense of ownership among the villagers. Apart from financial support from the donors, comparative advantages of the project area in terms of government support, infrastructure and literacy have led to a big success of this project.

Another recent innovative idea that is being tested in some districts in Andhra Pradesh in India is the 'Computer on Wheels (COW)'. To provide access to information, a motorcycle is used which is equipped with a solar-powered laptop computer and facilities like internet connectivity, printer, digital camera and a mobile telephone. It provides doorstep services at the village level. Farmers receive these services and get access to information on agriculture, healthcare and a range of other rural issues. The information provider, who is the facilitator in the model, visits every village once in a week both to collect queries and provide solutions to the queries collected during the previous visit.

Some countries are also experimenting with extension training for agents and specialists via the internet, using interactive instruction methods. The initial feedback shows that this allows flexibility in learning time, not having to travel, the subsequent saving, and being able to share ideas with many people over a large geographic area.

What is important to understand while using ICT-based methods for supporting agricultural extension is that agricultural extension alone is not sufficient to sustain an 'information shop' at the village or even subdistrict level. The information supply domain has to be much larger and dynamic so as to

offer value-adding information like market prices, local topical information, weather forecasts etc. In addition, the packaging of the information becomes very important—it has to be more visual and more complete.

Some suggestions for the success of ICT initiatives include:

- Involve local people in content development (as in village knowledge centre) to assess information needs and collection of indigenous knowledge, which can be synthesized, with information from experts/institutions;
- Prepare user-friendly content in the regional languages also with visuals;
- In kiosks, supplement the digital information with public address system, vernacular print media, and bulletin boards for wider dissemination;
- Use alternative technologies to substitute electricity (batteries and solar panel) and telephone connectivity (wireless network), use space in rural institutions (*Kebele* office, school, telecentre, FTC) to overcome infrastructure barriers (e.g. Soya-choupal, village knowledge centre).

Gender-orientation and addressing HIV/AIDS issues

Gender perspective and gender differentiation are issues frequently taken as a fashion rather than as a substantial contribution to rural development. In all developing countries, women play a major role in farming, even though it is most often disguised. Increasing number of rural female headed households (FHH)⁴ is also a fact one has to contend with, as also increasing incidence and negative impacts of HIV/AIDS, especially in African countries. The poorest people in the rural areas are the *de jure* FHH. Even in male headed households, women carry out most of the field work and have more agricultural knowledge than men do (Hagmann et al. 2001).

It is now widely demonstrated that rural women, as well as men, throughout the world are engaged in a range of productive activities essential to household welfare, agricultural productivity and economic growth. Yet women's substantial contribution continues to be systematically marginalized and undervalued in conventional agricultural and economic analyses and policies, while men's contribution remains the central, often the sole, focus of attention.

Women are typically, and wrongly, still characterized as 'economically inactive' in statistical surveys of agriculture, a result that tells us more about survey methodology than about reality (Janelid 1975). Agricultural extension services still do not attach much importance to reaching women farmers or women on the farm. Policymakers and administrators typically still assume (in the face of the empirical data) that men are the farmers and women play only a 'supportive role' as farmers' wives (Samanta 1994).

The official definition of a farmer in Nigeria in 1965, for example, was given as 'an adult male... who has the right to the produce of a farm... women are not classified as farmers'. Yet among many studies of rural women in Nigeria (WORDOC 1988), Akor (1990) found that 92% of the surveyed northern rural women gave farming as their primary or secondary occupation. Of these, 74% owned or worked their own separate plots. While the official definition of a farmer in Nigeria has been corrected to be gender neutral, as in most other countries, gender bias is prevalent in official agricultural circles and

4. This includes both *de facto* (where the husband has migrated to town) FHH and *de jure* (comprising widows and unmarried women).

among field professionals. Similar investigations conducted in selected states in India show that more than 60% of agricultural operations are performed by women farmers, yet the fact that 'most farmers in India are women' (Shiva 1991) is simply not reflected in extension provision or training.

The constraints affecting rural women's ability to improve yield, profit and efficiency in agriculture include (1) women's legal and cultural status, which affects the degree of control women have over productive resources, inputs such as credit, and the benefits which flow from them (Olawoye 1989); (2) property rights and inheritance laws, which govern access to and use of land and other natural resources (Jiggins 1989a); (3) the relationship among ecological factors such as the seasonality of rainfall and availability of fuelwood, economic factors such as product market failures, and gender-determined responsibilities such as feeding the family, which trade off basic household self-provisioning goals and care of the family against production for the market (Horenstein 1989; Jiggins 1989b); and (4) the way that agricultural services are staffed, managed and designed (Gittinger et al. 1990; Saito and Weidemann 1990; FAO 1993). Other constraints women farmers face are less mobility and time availability as men; lack of formal education which hampers them from taking part in extension activities requiring formal reading and arithmetic skills.

Experience shows that if women rather than men are targeted with resources, the end result is that welfare benefits will accrue directly to them and their children (Buvinic and Gupta 1997). In rural Zimbabwe, 40–60% of all the households are female headed, but only slightly more than 10% of these participate in agricultural extension training. These figures may partly explain the low output and success of extension. In extension, only about 10% of the extension workers are female.

Agricultural extension strategies traditionally have focused on increasing production of cash crops by providing men with training, information and access to inputs and services. This male bias is illustrated in farmer training centres, which have been established to provide residential training on technical subjects. Most do not provide separate washing and sleeping accommodations for men and women and do not provide facilities for the care of babies or young children, factors which may prevent women from attending the centres. Second, women's daily workloads do not usually allow them to be absent from home for residential training; even attending short courses may cause insuperable problems in arranging substitute care for children or the home. And third, even where attendance of women is quite high as a proportion of the total, women are given instruction mainly in home economics and craft subjects, not technical agriculture (Staudt 1976; Perraton et al. 1983).

Further, in the overwhelming majority of countries, extension services have been staffed predominantly by men. Only in countries such as the Philippines have women field staff been deployed in sufficient numbers and with sufficient resources to become effective agents of change among women farmers.

On the other hand, it is typical of ministries to assume that home economics services can substitute for agricultural training and information for women. Home economics and agriculture are both important, but they are not substitutes.

In developing country cultures, information flow appears to follow the hierarchical structure in which the male head of the household is not obliged to inform other household members, but females and children are accountable to the male head and therefore information flows smoothly in this direction.⁵

5. Same applies to communities—farmers complained that their leaders never reported on the meetings and courses they attended.

So, if the man in the household is trained it cannot be assumed that the knowledge and information so acquired will filter down to the women in the household. Communication among female members of the FHH is better than between the sexes (Hagmann et al. 2001).

Agricultural extension services have a long tradition of working predominantly with men. However, due to improved awareness in the last two decades on the role that women play in agriculture and that agriculture continues to remain a very important source of livelihood for women, special programs have been initiated and targeted at women in agriculture in various developing countries (Walker 1990).

An example is the homestead gardening component incorporated in an extension program in Bangladesh. The objective of this was to make new technology available to women in order to augment production of vegetables, fruit and livestock and introduce better ways of processing and using food. Besides involving the women in extension, this was seen as a way of diversifying the diets of the rural poor, attacking malnutrition, using underutilized homestead space and boosting family income through the sale of surplus homestead production. Under contract, NGOs would work with women to improve homestead gardening practices. NGOs organized women into groups to encourage them to take up intensive homestead cultivation and improve food handling and preparation. Building on their success, women have also used these groups to obtain group loans to start micro-enterprises—benefits beyond the expectations of the project. However, the most significant benefit from this component has come from solidifying the NGO–Department partnership, which will long outlast the project.

In Cameroon's North West province, the Mission de Developpement de la Province du Nord-Ouest (MIDENO), implemented a project to improve agricultural production in the province. In terms of agricultural extension, the project has hired almost 200 new extension agents, one-fourth of whom are women. The overall representation of women in the extension service is now 18.3%, among the highest in developing countries (Walker 1990).

Ethiopia implemented a two-year Pilot Project at MoARD supported by FAO which started in 1994, which involved training extension staff in PRA and gender analysis to ensure client-oriented extension planning. A guide for field level workers in local language was developed, which included the use of gender-analytical framework in planning. The four major challenges faced during this were: difficulty of institutionalizing the process, necessity of involving policymakers at all stages and levels, need to raise gender awareness amongst rural men and women and, importance of addressing women's lack of decision-making power (Percey 2000).

As a part of formulating the Framework for Agricultural Extension, India developed a 'Cafeteria for Women' (Sulaiman et al. 2003). The cafeteria provides guiding principles and an approach to develop projects and programs with gender issues in consideration. The cafeteria is essentially guidelines, and it allows the implementing agency (who will be developing the program or project), at the district/block level, to choose an approach that fits into their specific situation (based on local problems, socioeconomic conditions of women, nature of primary occupations, availability of suitable organizations to partner with etc.).

Some priority themes identified for the cafeteria were:

- Mobilization of groups—community resources persons;
- Groups—formation, capacity building including training and skill development;

- Linkages and support—resource/information centres, hire schemes, convergence with other projects, coordination of inputs, marketing, credit, diversification, private sector, commercial development;
- Communication and media support to extension—pictorial material, TV;
- Technology—development, identification, evaluation, refinement for women to reduce women's workload (production and postharvest technology), adoption;
- Staffing—increase number of women extension workers;
- Gender training and sensitization for policy makers, implementing agencies, extension workers;
- Sustainability.

These programs have conclusively proved that women, when given access to improved information and resources could increase agricultural production significantly. However, to make sustainable improvements in the livelihoods of rural women, their access to credit and opportunities for employment, enterprise development and income generation opportunities also have to be improved.

The introduction of the T&V system emphasized the selection of contact farmers as a mechanism for passing on information to other ('follower') farmers in their area. The recommended selection criteria, such as title to land, literacy, or cooperative membership, as well as male extension staff's assumptions about women's roles in farming, have largely excluded women's involvement (see Aarnink and Kingma 1991 for a Tanzanian case study). In only a handful of countries (including China, Mexico and Brazil) have women formed any significant percentage of contact farmers or follower farmers.

In some countries, individual contact has been complemented by group contact, especially, but not only, where it may be difficult for male change agents to have any type of contact with individual women other than their own relatives. In many cultural settings, group extension significantly increases women's access (Ashby 1981; Berger et al. 1984), because the group context calms the fears of male extension agents, husbands and women about transgressing norms of approved social contact.

This may be particularly true in Islamic areas where women are in partial or total seclusion. Furthermore, in Islamic societies, there are probably not enough qualified adult females who are able to take up the post of change agent at the field level. However, in countries such as Bangladesh, the pioneering efforts of large-scale, non-government, rural development agencies such as BRAC and the Grameen Bank have demonstrated that religion and custom are not necessarily barriers to the hiring and field deployment of female staff, to the mobilization of women's groups and training of women leaders at the group and village levels by male staff, or to the development of efficient savings and credit services for rural women (Jiggins 1994).

But training needs to be complemented by other strategies to bring about change in institutional behaviours. In Malawi, Spring (1985, 1986) demonstrated the range of often minor but critical adjustments which can increase women's access to extension and outlined the relevance of extension significantly, even where most field agents are male.

For example, male extension agents were encouraged to ask their male farmer contacts to include their wives during visits, demonstrations or farmers' meetings. Village leaders (typically male) were asked to identify women needing extension services. Field agents were required to devote a greater percentage of their time to working with women's groups. Women farmers' seminars were organized for women to share with researchers and field staff their solutions to the technical problems specific to women farmers' production systems, and women's field days were organized to celebrate and legitimate women farmers' successes and to promote farmer-to-farmer exchange among women.

Many of the examples cited here are relatively small-scale. The challenge is to achieve impact on a scale that makes a difference. Over the last three decades, Nigeria has experimented with different agricultural development strategies with varying implications for rural women. In the 1970s, World Bank-supported Agricultural Development Projects (ADPs) were established in a number of Nigerian states. By the mid-1980s, ADPs were found in every state; technology development and extension were major components of their programs. Toward the end of the decade, it became apparent that, while rural women had an important role in production, they were largely excluded from the ADP agenda. A Women in Agriculture (WIA) unit, with female extension staff, was established in every ADP throughout the country, with the goals of identifying the technical and information needs of rural women, assisting them to become more productive through training and technology dissemination, and meeting those needs through trained and qualified female agents working with women's groups. The WIA units today are fully integrated into the ADPs (World Bank 1996).

It has often been hypothesized that new agricultural technologies could have an adverse impact on women because additional labour required of them reduces the time spent and therefore income earned from private field activities. A study in southern Mali showed that the expansion of cotton cultivation on the household communal fields associated with the introduction of new technologies results in increased payments to women for their increased labour on the cotton fields. Unfortunately, these payments are small compared to the loss of revenue from private-plot production. Empirical analysis indicates that the net income controlled by women decreased with technological change. In the long run, as land becomes even more constrained, emphasis needs to be placed on institutional changes to increase women's bargaining power so that they obtain larger shares of the new income streams resulting from technological change on the communal field (Lilja and Sanders 1998).

Rural women seldom have autonomous control over the opportunities that may come their way or the benefits which flow from them. Many advantages won for rural women through development programs are later lost, as illustrated in the following quotation: 'When technological innovations do address women's tasks and make them more profitable, men often take them over. This was exactly what happened when pump irrigation was introduced for rice production in West Africa' (Gittinger et al. 1990, 10). For sustainable improvements, not only must benefits be targeted to rural women, but mechanisms must also be put into place to ensure that these benefits can be retained by the intended beneficiaries.

Women-in-Development literature often recommends that women's welfare would be improved by increasing their access to land and inputs. The development of marketing channels for women's cash crops would increase their incomes. Women would be less constrained to market their output at lower prices at the local market. Men shifting into activities which have become more profitable have been observed for agricultural and nonagricultural activities in other West African countries (von Braun 1988).

Most women farmers who are engaged in small business or micro-enterprises are either subsistence entrepreneurs or pre-entrepreneurs. The enterprises developed by women are usually seasonal and require low production skills, and their resultant products are poor in quality. These women entrepreneurs, being both producers and sellers of the produce are also usually isolated from markets and their limited mobility makes marketing a major constraint in the promotion of their enterprise. Furthermore, most of the small business and micro-enterprises identified and developed are done on the basis of the skills and raw material available rather than consideration of the markets, market needs and market dynamics (Jain 2002).

Outside interventions normally interact with community or family representatives, who are mainly men. This is a trap because power relations and decision-making competence in the families and in the communities indicate that women greatly influence the decisions announced by men. So, extension should try to include hidden decision-makers and strengthen their confidence to express themselves.

While contemplating on gender issues, the point is not whether gender differentiation is needed, but that we must consider people as farmers (male and female) who work the land. Promoting gender differentiation as an isolated theme or component can be counterproductive (e.g. women's projects) because they prevent people themselves negotiating gender roles. Addressing male and female farmers separately in agricultural extension can actually worsen communication and the information flow in families.

The tools and methods for addressing gender are culture-specific and should be developed and adapted with local experts. But the point worth noting is that it is vital to give women a chance to prove their capabilities wherever possible.

Some points to be considered for improving the effectiveness of training programs for women farmers include:

- Women dislike long lectures and can more effectively learn while doing; hence the program should be practical;
- Women prefer discussing problems that they currently face;
- Women prefer training programs at locations closer to home;
- Training on crop practices should be between 2–7 days long and paced in a way that complements the agricultural calendar rather than interfering with it. Training should be provided ahead of the land preparation/sowing operation and at the stage of crop maturity;
- The desirable time for meetings is in the afternoon, when women are relatively free;
- Illiteracy is very high among rural women and long notes are of limited use;
- Audio-visual material should be used to the maximum extent;
- Use of local dialects is important in focusing attention;
- Involvement of women training and extension officers would increase effectiveness of the program;
- For effective programs and participation of women, it is necessary to have as much homogeneity as possible in the groups chosen for training or extension meetings;
- Special efforts should be made to promote interaction and provide opportunities for practical work;
- Women's training must be planned according to their preferences, learning needs and abilities.

It would be a mistake to view rural women as a homogeneous social classification or to derive policies and services for 'women in agriculture' that are not based on empirical research that captures this diversity (Jiggins et al. 1997). Thus there should not be a centrally generated blueprint for tackling issues related to women farmers. It is important to recognize the various categories of women farmers that exist and their needs in the agriculture sphere and from there to develop appropriate strategies to assist them.

The HIV/AIDS epidemic is having startling consequences for agricultural development in developing economies. It has been noted that it is very important to mainstream consideration of these issues in agricultural sector policies and especially in extension. Some possible extension related strategies to face the challenge of HIV/AIDS (Qamar 2003):

- Formulation of a national policy on AIDS and extension
- Preparation of extension staff:
 - Revision of pre-service and in-service training curricula
 - Fast-track training of extension staff
 - Revision of extension strategies and technical messages
 - Preparation of multimedia extension materials on HIV/AIDS
- Possible actions in the field
 - Institutional partnerships
 - Anti-AIDS extension campaigns
 - Preparation of rural leaders for collaboration
 - Extension—HIV/AIDS specific studies
 - Inter-country extension networks on HIV/AIDS

2.4 Factors of success in the knowledge/technology dissemination process

Thrupp (1996) identified four major factors of success in knowledge and/or technology dissemination process.

2.4.1 Participation and empowerment of farmers and communities

In the most successful cases, farmers take the lead or share control in all aspects of the efforts. It was also recognized that all these initiatives are very responsive to farmers' needs and ideas; in several cases the development of alternative technologies was instigated and carried out by farmers, with assistance by researchers and extensionists. This form of participation can also enhance decision-making and management capacities. These participatory approaches are most valuable when they involve two-way development and exchange of ideas and knowledge among the farmers, technical people and/or scientists.

To build such participatory interactions between farmers and other stakeholders, mutual trust and continual open communication are invaluable. This requires sharing of power and control among groups involved, reversing the usual patterns whereby the scientists and technical people are in control. Other human qualities identified by project groups as keys to effective participatory actions include commitment by all actors, flexibility, willingness to innovate and sensitivity and respect for other people. Working with and strengthening local farmers or community organizations furthers learning and adoption of alternatives and empowers more people.

2.4.2 Linkage between groups/institutions

Forging alliances or close collaboration between research institutions, extension agencies, NGOs and farmers has proven to be an important and effective way to develop and spread alternatives to high-input approaches. A number of factors contributed to the formation of institutional alliances. The major ones are: all types of groups involved are the same that the conventional approaches to technology development and dissemination often were not bringing about positive changes to, and instead, were causing problems. The other major problem is many have faced budget cuts and resources became scarce and thus realized the need to pool resources and capacities.

In many cases potential partners also agreed on a set of criteria that the new technologies should meet:

- farmers participate in innovation, evaluation and diffusion;
- indigenous knowledge and skills are an integral part of the technology development and dissemination process;
- adopt technologies that are cheap and accessible, help avert risk, and are socially and culturally sensitive;
- new technologies are aimed at enhanced sustainability of the whole farming system and not just the production of a single commodity.

Multiple benefits of partnerships include new knowledge and skills, cost-sharing, respect and functional complementarities. Collaboration/partnership in these cases is a means, not an end for developing and implementing sustainable agriculture. Collaboration also has additional functions:

- it helps develop trust and confidence among partners
- it enables sharing of responsibilities and visions
- the linkages also foster an interdisciplinary and holistic approach that is key to sustainable agriculture
- it also enhances the managerial abilities and negotiating powers of NGOs
- teaches the R & D actors about farmer-friendly approaches
- avoids duplication of efforts and
- enhances communication between NGOs, farmers, researchers and other groups as they work together.

Carrying out project activities involving multiple stakeholders requires considerable coordination and organization of specific responsibilities and roles of partners. The points to consider are:

- Mechanisms may be formal or semi-formal contracts (where formal contracts may create rigidities or impose unfair control by one partner);
- An effective coordinator is essential to make progress, provide supportive leadership and help spark motivation; need strong capacities to facilitate communication, to gain mutual trust, and to resolve tension;
- NGOs contribute unique skills, innovative methods and capacities that enable them to work well with farmers and communities and to carry out participatory educational activities. They also bring to the partnership expertise in resource-conserving practices, methods for community empowerment and participation and local solutions to agricultural problems;
- Effective research is action-oriented, field-based, on-farm, responsive to local needs and holistic.

Tensions understandably arise at times between collaborators, especially at the beginning, as a result of contrasting interests, disagreements over decision-making, differences in power, or control of funds. Partnerships are usually more effective when the parties agree on philosophy and approaches from the outset.

2.4.3 Innovative learning and communication

Developing new and participatory learning processes is a critical part of effective collaborative initiatives. In many cases, a two-way learning process is developed involving a reciprocal exchange of knowledge and ideas between farmers and technicians and scientists. Farmers and technical personnel communicate openly, usually in farms, exchanging complete information about a range of farming

methods, their benefits and costs. Such farmer-to-farmer learning is also valuable for the transfer and spread of knowledge.

- interactive communication methods, use of visual networks and posters
- creative learning methods
- social celebrations.

2.4.4 Policy and political influence

The development of effective systems for knowledge and sustainable technology development needs a supportive policy environment and political commitment. If the government is committed to change, progress can happen more quickly.

2.5 Factors affecting clients' access to extension services

Some major factors that affect clients' access to extension services are:

Gender: It is generally assumed that men and women have different levels of access to agricultural extension services from which they benefit in different ways.

Farming system: The private sector in extension will focus on conventional, input intensive agriculture where information is linked to inputs. Sustainable agriculture, which is recognized as knowledge intensive and requiring an approach to local learning which highlights local rather than external knowledge, is less likely to receive attention from commercial providers. Sustainable agriculture therefore requires much more than the adoption of new technology—it requires an entire paradigm shift, which can only be achieved on the basis of incremental learning (Röling and Jiggins 1994).

Wealth status: The wealth category of a farmer may affect his or her access to, and benefit from, extension services.

Land ownership and farm size: The prevailing land ownership system and size of land owned by the farmer may affect farmers' access to, and benefit from extension services.

Membership of farmer group/community organization: Many extension service providers both in the public and private (profit and nonprofit organizations) sectors have institutionalized the group approach for the delivery of extension services. As well as offering the opportunity for greater efficiency, effectiveness and equity of provision and access, farmers' groups and organizations can be a vehicle through which farmers can pay a contribution for services, become actively involved in the planning and management of extension, and act as a voice for their members in 'pulling down' services which meet their needs.

Other factors: Other factors such as cultural constraints, education, age, access to credit and risk taking ability may affect farmers' access to and benefit from extension services.

2.6 Changing paradigms in extension, and roles of extension agents

Extension services were traditionally assumed to be the conduits for transferring technologies developed by the research system to the farmers. The system however, has been under severe attack for not being able to contribute to desired developmental impacts in developing countries. With changing circumstances of agriculture and increasing trends of globalization, commercialization and drive

towards sustainability, extension is being looked upon to play an expanded role with a diverse set of objectives, which include:

- better linking of farmers to input and output markets
- reducing the vulnerability and enhancing the voice of the rural poor
- developing micro-enterprises
- poverty reduction and environmental conservation
- strengthening and supporting farmer organizations.

This necessitates adopting systems of innovative extension which is characterized by: recognition and utilization of multiple sources of knowledge; focus on capacity to solve problems rather than just training for technical capacity building; adopting an interactive communication function; viewing extension as a co-learning process and; institutional pluralism.

Over the past two decades, the agricultural R&D system has undergone drastic transformation and societies have moved towards an accelerated agricultural modernization and macro-economic reduction of public services. Agricultural extension, like other historically considered public goods underwent and is still undergoing systematic reform.

The system has been decentralized in various ways:

- Structurally through shifting partial or full authority for extension to lower levels of government or to private entities;
- Financially through cost-sharing and cost recovery schemes;
- Managerially through the democratization of the decision-making process to include grass root stakeholders and in other cases rescinding government involvement entirely.

ven den Ban and Hawkins (1996) arrived at a concept of extension that seems to synthesize the various perspectives into five goals:

- transferring knowledge from researchers to farmers
- advising farmers in their decision-making
- educating farmers to be able to make similar decisions in the future
- enabling farmers to clarify their own goals and possibilities and to realize them and
- stimulating desirable agricultural developments (rural guidance). They noted that stimulating desirable agricultural development is the most common goal of extension directors.

In the current context, extension is viewed both a system and a set of functions performed by that system to induce voluntary change among rural people. A set of functions includes:

- Transferring technology in multiple directions for sustainable agricultural production, transformation and marketing;
- Transferring management to mobilize and organize farming, rural groups and communities; and
- Transferring capacities to educate, build human resources, and enhance local capacity: for example IPM, market intelligence, and farm management and in negotiating financial, input, and market services.

A system includes all public and private institutions that transfer, mobilize and educate rural people, as distinct from a service or single institution that traditionally provides advice only (Zijp 1998).

Rölling (1986) interprets the range of extension functions in terms of two traditions—Technical Innovation (TI), and Human Resource Development (HRD). From his perspective, most of the world's extension

agencies are engaged in pure TI financed by tax revenues to make the production of food, raw materials and export commodities as efficient as possible. HRD is focused on rural people themselves and on the social systems in which they function, and deals with such processes as community and leadership development, building institutions and farmers' mobilization and organization.

2.6.1 New roles for extension in the new approach to extension

The thinking and practice about the ways in which agricultural research and extension should be organized and which elements need to be included has constantly changed in the recent decades. A number of different frameworks have been promoted, as the basis for investments in agriculture technology development. In the 1950s and 1960s, the focus was on building public sector research departments and institutes and extension services. This broadened with the National Agricultural Research System (NARS) approach of the 1980s, the Agricultural Knowledge and Information System (AKIS) approach in the 1990s, and the recent Agricultural Innovation System (AIS) approach.

Innovation is 'the transformation of an idea into a new or improved product introduced on the market or a new or improved operational process or into a new approach to a social service.' Thus, innovation is seen to involve more than research and development; it also entails the workings of the marketplace. While the notion of advancing the development and diffusion of innovations is not new, agriculture knowledge system success depends on innovations being disseminated, adopted and practised by farmers. AIS emphasizes 'agricultural' innovations and goes beyond previous knowledge system concepts by incorporating the goals of reform measures, such as decentralization, public sector alliances with the private sector, enabling the private sector, advancing consensus approaches to development and promoting demand-driven services. AIS stresses decentralized, demand-driven approaches and broad stakeholder participation in the control, support and implementation of the agricultural technology agenda. AIS differs from previous frameworks by drawing attention not only to the need for innovation but also to the pluralistic involvement of different institutions in agricultural research and extension.

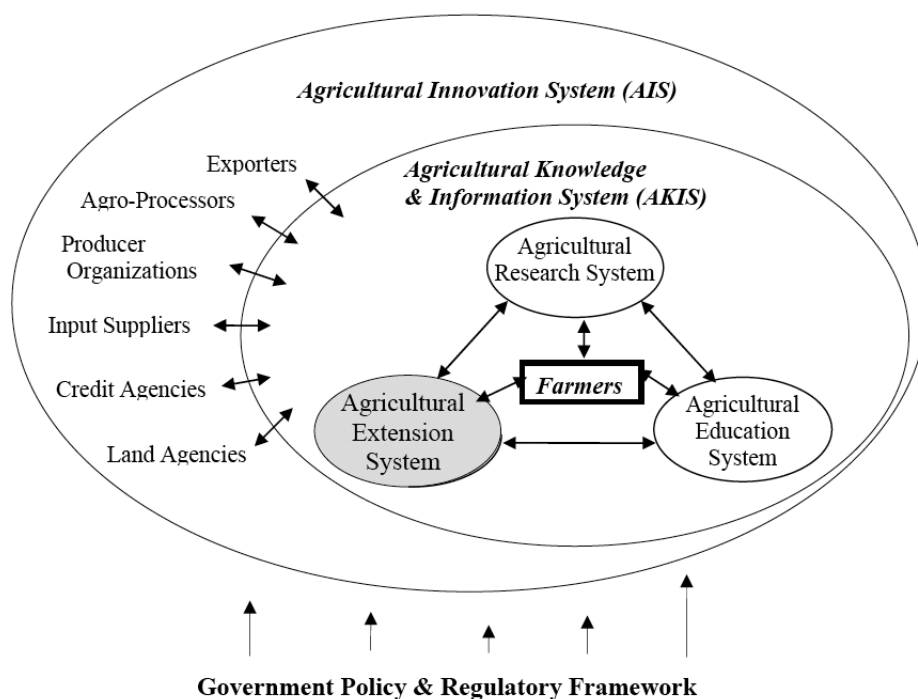
Agricultural extension service is a key actor in the agricultural innovation system (Figure 2.2). With its strong and wide grassroots presence, it remains the major source of knowledge for farmers in developing countries.

An effective agriculture extension system will need to provide a broad range of services (advisory, technology transfer, training and information) on a wide variety of actions (agriculture, marketing and social organization) needed by rural people so that they can better manage their agricultural systems and livelihoods.

The shift in thinking about extension service delivery over the last few years highlights:

- Seeing extension as a set of functions, to be performed by a variety of players, at different levels;
- Seeing a wider mandate for extension, that also includes farmer mobilization, organization and education;
- Seeing a coherent, comprehensive knowledge system for the generation, transfer and uptake of knowledge and technology, that includes the farmers, research, extension and education;
- Creating a more realistic, cyclical and dynamic model of information exchange and knowledge dissemination whereby farmers, researchers, educators and extensionists are all engaged in the generation of new knowledge, and in its transfer, and in its use;
- Allowing projects to develop a learning mode, engaging all major stakeholders;

- Taking some risks by including experimental information technologies in projects to link research institutes, extension managers, farmer organizations and others to each other and to the rest of the world.



Source: Adapted from Rivera et al. (2005).

Figure 2.2. *Agricultural extension as component of an agricultural knowledge and innovation system.*

With extension being asked to play a 'technology development role' by linking research with community group needs and helping to facilitate appropriate technology development, need for some important changes emerge.

Conceptual approach

1. Research and extension are services and should be driven by demand

To be successful, agricultural research and extension have to respond to the private and social demand for assistance to solving agricultural problems. It is the farmers who finally decide whether a change proposed to them actually becomes a useful innovation or not. Therefore, any support activity has to build (directly or indirectly) on the needs of farmers. The same consideration applies to socially desirable innovations (e.g. erosion control). The decisive point is demand, in this case underpinned by some form of collective organization.

2. Knowledge is the focal point

Innovation is based on knowledge. Applied research and agricultural extension as well as communication and training have the final purpose to help people learn, so that they understand and master the challenges of their environment better. Dealing with the same matter (information and knowledge) and building upon each other, these services can be summarized as 'knowledge-related services' or 'innovation services'.

3. Pluralism of service providers

Innovation can be generated by different organizations, groups or individuals—not by research institutes and extension services alone. It is important to take account of this pluralism, i.e. to include all those (private or public) who contribute to innovation or problem-solving in some way. People working on similar issues, be it in a specific commodity sector, at a particular location or in any problem area tend to form a chain or network with the end user of the information (e.g. the farmer) at the core. Such a chain or network can be described as ‘innovation system’ or, for agriculture in general, as ‘agricultural knowledge system’.

4. Strategies to develop Agricultural Innovation Systems

Advancing agricultural innovation means building institutionally sustainable innovation systems. Criteria for sustainable innovation systems are the growing interrelation between the participants in the innovation system, an intensive communication between all stakeholders and, generally, a strong ‘social embedding’, i.e. a political and economic context favouring agricultural progress.

5. Innovation services for small farmers

Technical progress in small farm sectors, e.g. in Africa, poses special conditions, not only because farming systems are complex and diverse but also farming is closely connected to the general conditions of rural livelihoods. Local knowledge and farmer experimentation (the traditional innovation system) play a key role. Services thus have to take a participatory approach to rural problem-solving covering a wide range of issues, of which technology development is just one part. Building local innovation capacity requires in particular to strengthen the problem-solving capacity of local organizations and to mediate between rural communities and external sources of knowledge.

Functional approach

The functional approach considers four different but inter-related roles for extension. These are:

1. Empowerment: The extension workers’ role is to help farmers and rural communities organize themselves and take charge (empowerment) of their growth and development. Telling adults what to do provokes reaction, but showing them triggers the imagination, involving them gives understanding, and empowering them leads to commitment and action (Chamala 1990). The term ‘empower’ means enable, allow, to permit and can be viewed as both self-initiated and initiated by others. For extension workers, empowering is an act of helping communities build, develop, and increase their power through cooperation, sharing and working together.

2. Community organizing: The extension workers need to learn the principles of community organizing and group management skills (Chamala and Mortiss 1990) so they may help the community, especially the poor or weaker sections, to organize themselves for development. In this regard, understanding the structures, by-laws, rules and roles will help leaders plan, implement and monitor their programs and perform this new role effectively. Skills in conflict resolution, negotiation and persuasive communications help develop leaders and members of farmer organizations.

3. Human resource development: The development of technical capabilities must be combined with management capability. The entire philosophy of human capacity building is to encourage rural

communities understand their personal and group styles of managing themselves and to improve their planning, implementation and monitoring skills.

4. Problem-solving and education: This aspect is changing from prescribing technical solutions to empowering farmer organizations (FOs) to solve their own problems. This is achieved by helping them identify problems and seek solutions by combining their indigenous knowledge with improved knowledge and using their resources properly. Further, there is a shift in the extension workers' role in education: from lectures, seminars, and training to learning-by-doing, and encouraging farmers and FOs conduct experiments and undertake action-learning projects.

Such innovative changes and shifts in institutional developments can be best summarized in what is popularly termed Extension-Plus approaches being pioneered in India. In these cases, extension type organizations (public or private sector) act as a nodal point for linking farmers to both technology and non-technology services. The learning emerges from pilot interventions through experimentation, reflection and learning to evolve new and successful institutional arrangements through partnership with other organizations, networks and schemes (Sulaiman and Hall 2004). The major shifts entailed in this conversion are outlined in Table 2.5.

Table 2.5. Operationalizing extension-plus: Key shifts

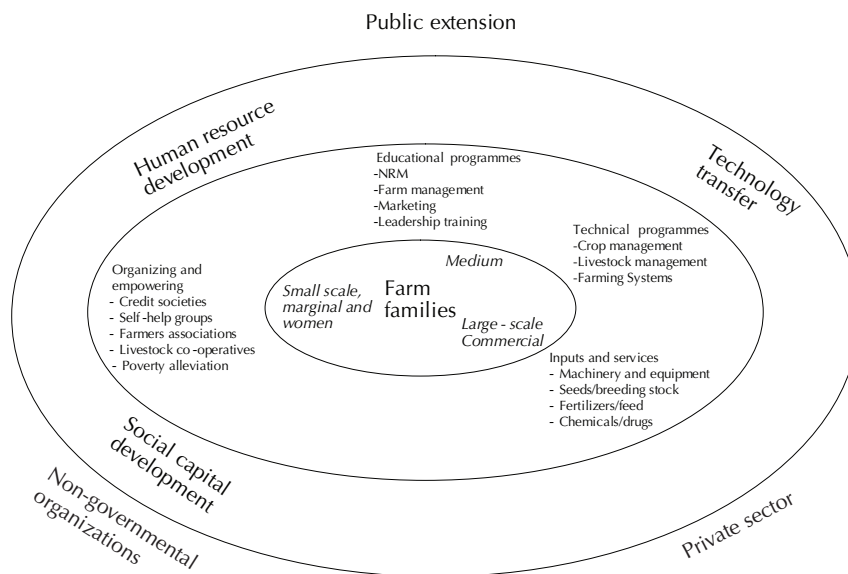
Items	From	To
Form/content	Technology dissemination	Supporting rural livelihoods
	Improving farm productivity	Improving farm and non-farm income
	Forming farmer groups	Building independent farmer operated organizations
	Providing services	Enabling farmers to access services from other agencies
	Market information	Market development
Monitoring and evaluation	Input and output targets	Learning
Planning and implementation strategy	Doing it alone	Partnerships
Sources of innovation in extension	Centrally generated	Locally evolved (through local experimentation)
Approaches	Fixed/uniform	Evolving/diverse
Capacity development of staff	Training	Learning by doing, facilitated experimentation
Capacity development of extension system	Personnel and infrastructure	Development of linkages and networks
Policy approach	Prescriptive/blue prints	Facilitating evolution of locally relevant approaches
Introducing new working practices	Staff training	Changing organizational culture through action learning
Underpinning paradigm	Transfer of technology	Innovation system

Source: Sulaiman and Hall (2004).

Future investments in agriculture development will also require more sustainable institutional arrangements for providing knowledge and information services to farmers. For this to happen, both the public and private sectors will need to assume new roles and responsibilities (Figure 2.3).

Five innovative approaches that have generally been highlighted, in literature, to make extension more efficient and effective in helping farmers to be more productive, profitable and sustainable include:

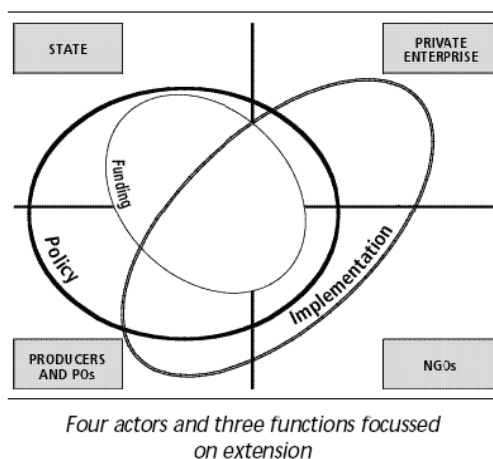
(a) delinking public funding for extension from private delivery, (b) empowering farmers, (c) decentralizing government, (d) involving the private sector and, (e) interconnecting rural people.



Source: Swanson and Samy (2002).

Figure 2.3. Suggested roles for public and private sector actors in extension.

It is increasingly being emphasized that to be efficient and effective, the public sector should focus on policy formulation and funding issues, while collaborating with the private sector and other actors to take the lead in implementation (Figure 2.4).



Source: Neuchatel Group (1999).

Figure 2.4. Proposed division of functions for various actors.

With the focus on developing efficient Innovation Systems, with improved access to knowledge from multiple sources and its utilization, an extension organization is expected to become a knowledge-

intensive organization, which is involved in the production and dissemination of knowledge. Its success, therefore, depends to a large extent in knowledge management. A major role of the managers is to ensure that:

- It gets relevant knowledge wherever this is produced;
- Staff members use their creativity to acquire/develop new knowledge;
- All staff members have access to all knowledge which is available in the organization;
- One learns from experience how to develop more effective extension methods;
- There is a social climate which stimulates sharing of knowledge and a critical analysis of the knowledge developed or used by colleagues.

The six principles that have been enunciated for making extension systems effective are:

- A sound agricultural policy is indispensable;
- Extension consists of 'facilitation' as much if not more than 'technology transfer';
- Producers are clients, sponsors and stakeholders, rather than beneficiaries of agricultural extension;
- Market demands create an impetus for a new relationship between farmers and private suppliers of goods and services;
- New perspectives are needed regarding public funding and private actors;
- Pluralism and decentralized activities require coordination and dialogue between actors (Neuchatel Group 1999).

2.6.2 New roles of public sector extension

According to Farrington (1995) the public sector's role in extension can be justified on the basis that:

- Much of the information relevant to technological innovation is 'public goods' in character;
- Agricultural production is a risky business;
- Access to information is often poorer in areas beyond the immediate radius of administrative and commercial centres;
- Regional imbalances in service distribution suggest that public action is needed to enhance the incomes of people on the periphery;
- The quality of agricultural inputs and information needs to be maintained and assured.

These justifications focus on the role of information as a factor of production on individual farm holdings, but also indicate that the public sector's role is one of providing access to all.

However, public agricultural extension service has significant shortcomings as outlined by Antholt and Zijp (1995), Umali-Deininger (1997) and Farrington (1994, 1995). They further argue that a reassessment of the public sector's role in the provision of services is imperative given:

- High and unsustainable public costs as governments in many developing countries have found it difficult to make adequate resources available for agricultural extension, which affects the quality of field and technical staff;
- Poor (or unknown) performance. The impact of extension on production can rarely be separated out from other factors, such as research, or changes in output prices or input availability (Farrington 1995);
- Lack of responsiveness to the variation in farmers' needs and changing contexts and opportunities. A rapid expansion in communication technologies (e.g. radio and television and in some cases

the internet) gives farmers a wider choice of information sources, which are provided through a range of public and private (profit and nonprofit) agencies;

- Pressures towards participation and good government. In some countries, these processes are reinforced by political reform. However, the evidence remains unclear as to whether the additional benefits of participatory approaches are sufficient to outweigh the costs (Farrington 1995). There is evidence that public services still fail to reach poor and women farmers, even when positive efforts are made towards increased participation.

A number of issues beyond food and nutritional security and poverty alleviation require concerted action.

- **A clean environment:** In a number of countries, the government is going beyond production interests and fostering environmental practices through a combination of better-adopted technology, high quality extension services, supportive legislations and regulations concerning pesticide and nutrient use and economic incentives that mobilize farmers for meaningful change—cleaning up environments degraded in part by non-point sources of pollution.
- **Food quality and related issues:** Extension agents, in addition to agricultural production knowledge transfer, engage in enhancement of product quality, promotion of food safety and awareness concerning the transition to IPM, environmental problems and resource management. They also provide impartial evaluation of new products and services. Waste management, protection of endangered species, clean water and other laws will obviously need to be promoted.
- **Social equity:** Fee based agricultural information transfer systems tend to be biased towards larger, wealthier farm enterprises. There is an argument that the public sector has a special role to perform in small farm development when this role is not fostered by the private sector.
- **Sustainable agriculture:** National public sector support is considered increasingly critical for safeguarding, sustainable agriculture and ensuring clean environment (Altieri 1990). Farmers attempting to become competitive are unaware of the unsustainable nature of their resource base. NRM is an obvious, pressing and critical need, one for which the public sector again has a crucial role to perform. Extension is needed to assist farmers with understanding and responding pragmatically to, for instance, environment management laws, as well as to insist with practices that serve to maintain a clean environment. Extension has a key role to play in the promotion of policy education, the adoption of nutrient management and pollution control technologies among both crop and animal producers.

In short, public sector extension has a number of known goals to execute, including the promotion of social equity, through non-formal education and technology transfer to small-scale farm operations and the promotion of new technologies to advance sustainable development and to foster the use of measures to protect the environment (Rivera 1996).

2.7 Emerging challenges and opportunities

In most developing countries, pluralism has become the government's goal to include other, usually private organizations, in both the funding and delivery of extension services. The emerging conclusion is that, contrary to the view that national extension systems have outlived their usefulness, there is a need for national policy and international assistance for certain public sector extension services. The emerging new challenges provide new opportunities for developing the role of public sector extension in the future.

In addition, the competitive interest of the private sector forced the re-examination of the way in which public sector agricultural extension was conceived and practised. At the same time the nature of the agricultural information was also changing in terms of its content, the means by which it is transferred, and its marketability as a 'commodity'. The content change was associated with the modernization of agriculture. The means of information transfer has been advanced through modernization of telecommunications, and the popularization of computers, cell phones providing immediate access to information—price information, weather forecasts. Agricultural information had also gradually come to be considered a commodity with a price tag attached. This commodification of agricultural information, i.e. the transforming of knowledge with a product for sale, helped to revolutionize both public sector extension and the business of private sector technology transfer (Rivera 2000).

Ideally, governments use public research and extension institutes for achieving development goals and hence are the principal customer of research services. Not governments, but farmers are supposed to actually benefit from technology development and dissemination. Hence, farmers are research clients as well and many research institutes would certainly name them as the principal customers. What happens is that, in fact, public research and extension institutes find themselves with two clients—one who pays, and the other whom the research is carried out for.

The situation of a split in accountability, towards the farmers and towards the government, can easily lead to contradictory signals or, what in fact is more likely; to quite weak signals and incentives as neither of the clients has full control over the service process. Public R&E institutes are caught in between their traditional practice as implementing government authorities on the one hand and calls for institutes to become committed and flexible service providers to customers on the other.

In the last years, the conditions for public agricultural services such as research and extension have undergone significant change. This has to do with widespread liberal policies, administrative decentralization in many countries and the decline in the level of public funding. Today, the typical split in accountability between the two principal stakeholders, financing institutions and the 'beneficiaries', makes way for a more varied and complicated picture of institutional relations. New accountability mechanisms are being created.

The most important issue here is related to funding: as less money is available through budget allocations, more and more research institutes have to look for alternative sources of funds. Examples are competitive research funds reserved for specific tasks, joint ventures with other institutes or contract research commissioned by the private sector, farmer organizations or donors. The utilization of such new instruments for public funding is particularly advanced in Latin America. The withdrawal of the state from public research and extension programs corresponds to policies leaving more tasks to the private sector and/or assigning a more important role to the 'third sector' in development, e.g. NGOs, local or farmer organizations. Another factor is the enhanced regional cooperation between research institutes. Hence, the number of players in agricultural development increases and there is more competition for funds and for partnerships. As a consequence, a form of 'market' for research and other innovation-related services emerges in some countries.

National agricultural research institutes (NARIs) tend to lose the monopoly for executing public research programs. Privately-funded innovation development becomes more important and even public R&E organizations will increasingly have to enter into some form of service relationship with private as well as public customers. Instead of being subordinated to the hierarchy of the public sector, public

institutes have to interact with several clients and stakeholders exerting influence on funding levels, and they may even have to face competitors.

If the technological needs of farmers and other research clients are taken care of by the private sector, as is often the case in highly commercial agricultural (export) crops, public institutes can remain close to a regulatory and coordinating role and concentrate on basic research and scientific education. Specific client oriented innovation services may then be left to sub sector organizations and to the technology market.

The development of a market for innovation-related services suggests conceptualizing agricultural research and advisory services from a 'business' perspective. Research managers have to take over tasks that are typical for the private service sector, such as preparing offers and compete for funds. They need to relate to the market and have to face a situation of accountability towards a customer who pays, be it a competitive fund manager, farmer organizations, the private sector or specific tasks commissioned by a government agency, e.g. the Ministry of Agriculture. Therefore, under conditions of increasing institutional pluralism, those researchers, research programs or stations who work for the needs of practical agriculture will benefit from adopting some principles of service management.

Various opportunities exist for extension's development in the future. They include increased needs for food in the future as population increases and, especially, how to balance production increases with environmental sustainability. A key concern is how to reduce poverty and at the same time maintain sustainability of resources.

Partnerships and linkages for pluralistic systems offer a tremendous opportunity in today's context. The developing country extension landscape is increasingly being populated by a large number and variety of actors. Pluralism has almost become a pre-requisite for effective extension systems. However, coordinating these linkages is a daunting task and various mechanisms are emerging to manage this. Pluralism can help resolve the problem of coverage, ability to relate cause and effect, accountability, fiscal sustainability, and interaction with knowledge generation.

A valuable example of a public-private partnership for providing extension services is that of Cameroon. This is a good practice example of partnership between the government extension service and private agro-input supply companies. The key to success is the ability to leverage the comparative advantage of each party without compromising the efficiency, objectivity or the principles of the extension services. The private suppliers provide the new technologies while the national extension service shares its experience in testing new technologies with farmers through small-scale demonstration plots. The lessons learnt from this experience indicate that:

- The privatization and unbundling of state monopolies create opportunities for government agricultural agencies to team with private sector partners in the agro-input and supply subsector;
- Mutual interest in developing increased purchasing power in the rural areas contributes to breaking down distrust and suspicion between private and public partners;
- Private sector partners can profitably collaborate in the providing of extension services, improve coverage and test appropriate technologies with farmers;
- Technology transfer using micro-demonstration plots provides excellent opportunities for private sector partners to develop their products and match their supplies with real demand from farmers for agricultural inputs;

- The extension service's opportunity to recover some of its costs from the private sector partners could be an important step towards sustainability.

Advanced, high quality public sector agricultural extension services are continually integrating new messages with programs for producers, especially those that are not being covered by the private sector. Among these are: product quality enhancement, food safety, transition to IPM and sustainable systems, addressing environmental problems, resource management, impartial evaluation of new products and services, and validation and localization of new technology.

Furthermore, new priorities will likely challenge extension to develop new programs, new methods and new clientele. To date, extension's main responsibility has been the transfer of agricultural information to farmers and farm families. In the future, new questions are likely to be raised as a result of socioeconomic, political and technical developments. Response to these new questions will eventually alter what we think about who should be served, the issues to be addressed, and who should transfer extension services.

Major challenges of the agricultural extension services are:

- Information and organization in the agriculture sector must assume greater importance;
- People involved in agriculture need improved skills, information, and ideas in order to develop an agriculture that will meet complex demand patterns, reduce poverty and pressure or enhance ecological resources.

2.8 The future of extension services

The need for agricultural and rural information and advisory services is likely to intensify in the foreseeable future. In much of the world, agriculture faces the challenge of keeping pace with rapidly increasing population with few reserves of potentially cultivable land. Farmers will have to become more efficient and specialized. From government perspective, whatever priority is given to production, extension will remain a key policy tool for promoting ecologically and socially sustainable farming practices. Development strategies and policies will increasingly be planned in the future from a global perspective. New responsibilities will demand a more inclusive paradigm for extension, one that recognizes extension's role in educating consumers, retailers as well as producers—a renewed scope and purpose.

Extension, as the organized exchange of information and the purposive transfer of skills, is a rather recent phenomenon. Today's practice is different in that the process is dominated by organizations, and its scope has extended from disconnected local events to a complicated, large-scale, and even worldwide activity. Extension services must be judged against their proper goals; however, the one universal yardstick is their service function to rural communities. Extension that is not in touch with and does not significantly contribute to improving the life situation of its clientele has lost its legitimization. Main actors within the extension system are the members of rural communities, extension and other development personnel, researchers, and staff of commercial or public service and support organizations.

For decades the research–extension–farmer linkage, especially in developing countries, was based on a rather simple model. In order to achieve development, 'modern' research results had to be transferred to the 'traditional' farmer, and extension seemed to be the appropriate means to do so. 'The success of

an agricultural extension program tends to be directly related to the extent to which its approach fits the program goals for which it was established' (Axinn 1988).

Extension has long been grounded in the diffusion model of agricultural development in which technologies are passed from research scientists via extensionists to farmers. This approach is exemplified by the training and visit (T&V) system. Important lessons have been learned from the problems associated with T&V, and there is clearly a need to address the systemic issues facing extension (Zijp 1993; Antholt 1994). Extension will need to build on traditional communication systems and involve farmers themselves in the process of extension. Incentive systems will have to be developed to reward staff for being in the field and working closely with farmers. There must be a well-defined link between the well-being of field officers and the extension system, based on the client's view of the value of extension's and field workers' performance (Antholt 1992).

In designing extension, an approach is less important than its ingredients. It is important to isolate the ingredient of success and find ways to replicate or transfer their characteristics to improve the performance of another approach. These ingredients involve using local people as field agents, who belong to target groups, training extension workers in human resources development skills and collaborating with community organizations and their support groups to help them to use their own systems of knowledge, experimentation and communication. Impact on coverage can also be obtained by prioritizing, categorizing, and stratifying farmers with target groups, using cost-recovery schemes with more commercially oriented farmers to release public funds to serve small-scale farmers. Impact on coverage problem is most powerful through participation and control by farmer organizations, mobilizing other players, and using appropriate media.

While redesigning extension, it is important to:

- Explore ways of integrating positive characteristics of the private sector or NGO operations with public sector management;
- Broaden the historical tendency of extension to focus on production and pay more attention to transformation and marketing;
- Integrate farmer participation and control into other extension modifications;
- Recognize that addressing the generic problems of extension requires decentralization, and is even more effective when institutional pluralism is built in.

References

- Aarnink N and Kingma K. 1991. *Female farmers and male extension workers: Women and agriculture in Tanzania*. II. Women and Autonomy Centre, Leiden University, Leiden, the Netherlands.
- Adhiguru P and Mruthyunjaya. 2004. *Institutional innovations for using information and communication technology in agriculture*. Policy Brief No.18. NCAP, ICAR, New Delhi, India.
- Akor R. 1990. The role of women in agriculture and constraints to their effective participation in agricultural development in Nigeria. Paper presented at UNDP/ILO/DFRRI training workshop on monitoring and evaluation of rural women in productive skills project.
- Alex G, Zijp W and Byerlee D et al. 2002. *Rural extension and advisory services: New directions*. Rural Development Strategy Background Paper 9. ARD, World Bank, Washington, DC, USA.
- Altieri MA. 1990. *Agroecology and rural development in Latin America*. Division of Biological Control; University of California, Berkeley Albany, California, USA.
- Amanor K and Farrington J. 1991. NGOs and agricultural technology development. In: Rivera WM and Gustafson DJ (eds), *Agricultural extension: Worldwide institutional evolution and forces for change*. Elsevier, Amsterdam, the Netherlands.

- Ameur C. 1994. *Agricultural extension: A step beyond the next step*. World Bank Technical Paper 247. World Bank, Washington, DC, USA.
- Anandajayasekeram P and Stilwell T. (eds).1998. *Institutionalisation of farming systems approach in eastern and southern Africa*. SAAFSRE, FARMESA.
- Antholt CH. 1992. *Relevancy, responsiveness and cost-effectiveness: Issues for agricultural extension in the 21st century*. World Bank Asia Region, Technical Department. World Bank, Washington, DC, USA.
- Antholt CH. 1994. *Getting ready for the twenty-first century: Technical change and institutional modernization in agriculture*. World Bank Technical Paper 217. World Bank, Washington, DC, USA.
- Antholt C and Zijp W. 1995. *Participation in agricultural extension*. Environment Department Dissemination Notes (24). World Bank, Washington, DC, USA.
- Ashby JA. 1981. New models for agricultural research and extension: The need to integrate women. In: Lewis BC (ed), *Invisible farmers: Women in crisis in agriculture*. USAID, Washington, DC, USA.
- Axinn CN. 1985. *An examination of factors that influence export involvement*. UMI doctoral dissertation, UMI, Ann Arbor, Michigan, USA.
- Axinn GH. 1988. T&V extension. *Interparks, Interchange, international agricultural*, 5(3), College of Agriculture, University of Illinois at Urbana-Champaign, Urbana, USA.
- Axinn GH and Thorat S. 1972. *Modernising world agriculture: A comparative study of agricultural extension education systems*. Oxford and IBH Publishing, New Delhi, India.
- van den Ban AW and Hawkins HS. 1996. *Agricultural extension*. 2nd ed. Blackwell, Oxford, UK.
- Benor D, Harrison JQ and Baxter M. 1984. *Agricultural extension: The training and visit system*. The World Bank, Washington, DC, USA.
- Berger M, DeLancey V and Mellencamp A. 1984. *Bridging the gender gap in agricultural extension*. ICRW, Washington, DC, USA.
- Boone EJ. 1989. Philosophical foundations of extension. In: Blackburn DJ (ed), *Foundations and changing practices in extension*. University of Guelph, Guelph, Canada. pp. 1–9.
- von Braun J. 1988. Effects of technological change in agriculture on food consumption and nutrition: Rice in a West African setting. *World Development* 16(9):1083–1098.
- Brouwers J and Roling N. 1999. Living local knowledge for sustainable development. In: Warren DM, Fujisaka S and Prain G (eds), *Biological and cultural diversity: The role of indigenous experimentation in development*. Intermediate Technology Publications, London, UK.
- Buvinic M and Gupta GR. 1997. Female headed households and female-maintained families: Are they worth targeting to reduce poverty in developing countries. *Economic Development and Cultural Change* 45(2).
- Byerlee D. 1994. Technology transfer for improved crop management: Lessons for the future. In: Anderson J (ed), *Agricultural technology: Policy issues for the international community*. CABI (Commonwealth Agricultural Bureau International) Publishing, London, UK.
- Campbell DA and St. Barker C. 1997. Selecting appropriate content and methods in programme delivery. In: *Improving agricultural extension: A reference manual*. FAO (Food and Agriculture Organization of the United Nations), Rome, Italy.
- Chamala S. 1990. Establishing a group: A participative action model. In: Chamala S and Mortiss PF (eds), *Working together for land care: Group management skills and strategies*. Australian Academic Press, Brisbane, Australia. p. 368.
- Chamala S and Mortiss PD. 1990. *Working together for land care: Group management skills and strategies*. Australian Academic Press, Brisbane, Australia. p. 368.
- Chamala S and Shingi P. 1997. Establishing and strengthening farmer organizations. In: *Improving agricultural extension: A reference manual*. FAO (Food and Agriculture Organization of the United Nations), Rome, Italy.
- Chambers R. 1983. *Rural development: Putting the last first*. Longmans, London, UK.
- Contado TE. 1997. Formulating extension policy. In: Swanson BE, Bentz RP and Sofranko AJ (eds), *Improving agricultural extension: A reference manual*. 3rd ed. FAO (Food and Agriculture Organization of the United Nations), Rome, Italy.
- Dinar A. 1996. Extension commercialization: How much to charge for extension services. *American Journal of Agricultural Economics* 78(1).
- FAO (Food and Agriculture Organization of the United Nations). 1993. *The potentials of microcomputers in support of agricultural extension, education and training*. FAO, Rome, Italy.

- Farrington J. 1994. *Public sector agricultural extension: Is there life after structural adjustment?* ODI Natural Resource Perspectives 2. ODI (Overseas Development Institute), London, UK.
- Farrington J. 1995. The changing public role in agricultural extension. *Food Policy* 20(6):537–544.
- Farrington J. 1997. The role of non-governmental organizations in extension. In: Swanson BE, Bentz RP and Sofranko AJ (eds), *Improving agricultural extension: A reference manual*. 3rd ed. FAO (Food and Agriculture Organization of the United Nations), Rome, Italy.
- Feder G and Slade RH. 1993. Institutional reform in India: The case of agricultural extension. In: Hoff K, Braverman A and Stiglitz JE (eds), *The economics of rural organization: Theory, practice and policy*. Oxford University Press, New York, USA.
- Feder G, Willett A and Zijp W. 2001. Agricultural extension: Generic challenges and the ingredients for solution. In: Wolf S and Zilberman D (eds), *Knowledge generation and technical change: Institutional innovation in agriculture*. Kluwer, Boston, Massachusetts, USA.
- Garfield E, Guadagni M and Moreau D. 1996. *Colombia: Decentralization of agricultural extension services: Presented to extension workshop, alternative mechanisms for funding and delivering extension*. World Bank, Washington, DC, USA.
- Gautam M. 2000. *Agricultural extension: The Kenya experience: An impact evaluation*. World Bank, Operations Evaluation Department. World Bank, Washington, DC, USA.
- Gittinger JP, Chernick S, Horenstein NR and Saito K. 1990. *Household food security and the role of women*. World Bank, Washington, DC, USA.
- Gustafson DJ. 1991. The challenge of connecting priorities to performance: One State's response to the forces for change in US extension. In: Rivera WM and Gustafson DJ (eds), *Agricultural extension: Worldwide institutional innovation and forces for change*. Elsevier, Amsterdam, the Netherlands.
- Hagmann J, Edward C and Oliver G. 2001. Learning about stakeholder/gender differentiation in agricultural research and extension in Zimbabwe: Is he the farmer or the farmer's husband? In: Lilja N, Jacqueline AA and Louise S (eds), *Assessing the impact of participatory research and gender analysis*. Available at: <http://idrinfor.idrc.ca/archive/corpdocs/117290/quitobook.pdf>.
- Holden S, Ashley S and Bazeley P. 1996. *Improving the delivery of animal health services in developing countries. A literature review*. Livestock in Development. Crewkerne, UK.
- Horenstein NR. 1989. *Women and food security in Kenya*. World Bank, Washington, DC, USA.
- Howell J. (ed). 1988. *Training and visit extension in practice*. Overseas Development Institute, London, UK.
- Jain R. 2002. Group marketing and the role of women producers. In: *Proceedings of the national workshop on women in agriculture: Farmer to farmer extension*. Department of Agriculture and Co-operation, Ministry of Agriculture, Government of India.
- Janakiram S. 2004. *Rural information and knowledge system—A case study from Russia*. Champion, ICT for Rural Development, World Bank, Washington, DC, USA.
- Janelid I. 1975. *The role of women in Nigerian agriculture*. FAO (Food and Agriculture Organization of the United Nations), Rome, Italy.
- Jiggins J. 1989a. Agricultural technology: Impact, issues and action (chapter 1, part I). In: Gallin RS, Aronoff M and Ferguson A (eds), *The women and international development annual*. Volume I. Westview Press, Boulder, Colorado, USA.
- Jiggins J. 1989b. How poor women earn income in sub-Saharan Africa and what works against them. *World Development* 17(7):953–963.
- Jiggins J. 1994. *Changing the boundaries. Women-centred perspectives on population and the environment*. Island Press, Washington, DC, USA.
- Jiggins J, Samanta RK and Olawoye JE. 1997. Improving women farmers' access to extension services. In: Swanson BE, Bentz RP and Sofranko AJ (eds), *Improving agricultural extension: A reference manual*. 3rd ed. FAO (Food and Agriculture Organization of the United Nations), Rome, Italy.
- Kaimovitz D. 1991. The evolution of links between research and extension in developing countries. In: Rivera WM and Gustafson DJ (eds), *Agricultural extension: Worldwide institutional innovation and forces for change*. Elsevier, Amsterdam, the Netherlands.
- Lilja N and Sanders JH. 1998. Welfare impacts of the technological change on women in southern Mali. *Agricultural Economics* 19:73–79.
- Lionberger HF. 1968. *Adoption of new ideas and practices*. Iowa State University Press Ames, Iowa, USA.
- Moris J. 1991. *Extension alternatives in tropical Africa*. Overseas Development Institute, London, UK.

- Mulhall A and Garforth C. 2000. *Equity implications of reforms in the financing and delivery of agricultural extension services*.
- Nagel T. 1977. Poverty and food: Why charity is not enough. In: Peter GB and Henry S (eds), *Food policy: The responsibility of the United States in the life and death choices*. Free Press, New York, USA. pp. 54–62.
- Nagel U. 1997. Alternative approaches to organizing extension. In: Swanson BE, Bentz RP and Sofranko AJ (eds), *Improving agricultural extension: A reference manual*. 3rd ed. FAO (Food and Agriculture Organization of the United Nations), Rome, Italy.
- Neuchatel Group. 1999. *Common framework on agricultural extension*.
- Olawoye JE. 1989. Difficulties for rural women in securing resources for agricultural production: Two case studies from Oyo State, Nigeria. *Rural Development in Nigeria* 3(2):77–81.
- Percey R. 2000. Capacity building for gender-sensitive agricultural extension planning in Ethiopia. *The Journal of Agricultural Education and Extension* 7(1):21–30.
- Perraton H, Jamison DT, Jenkins J, Orivel F and Wolff L. 1983. *Basic education and agricultural extension: Costs, effects and alternatives*. Staff Working Paper 564. World Bank, Washington, DC, USA.
- Pretty JN and Simplice DV. 1997. Using rapid or participatory rural appraisal. In: *Improving agricultural extension: A reference manual*. FAO (Food and Agriculture Organization of the United Nations), Rome, Italy.
- Purcell DL and Anderson JR. 1997. *Agricultural research and extension: Achievements and problems in national systems*. World Bank Operations Evaluation Study, World Bank, Washington, DC, USA.
- Qamar MK. 2003. *Facing the challenge of an HIV/AIDS epidemic: Agricultural extension services in sub-Saharan Africa*. FAO (Food and Agriculture Organization of the United Nations), Rome, Italy.
- Rivera WM. 1996. Agricultural extension in transition worldwide: Structural, financial and managerial strategies for improving agricultural extension. *Public Administration and Development* 16:151–161.
- Rivera WM. 2000. The changing nature of agricultural information and the conflictive global developments shaping extension. *Journal of Agricultural Education and Extension (Wageningen)* 7(1):31–41.
- Rivera WM. 2001. Whither agricultural extension worldwide? Reforms and prospects. Paper prepared for conference on knowledge generation and transfer: Implications for agriculture in the 21st century, University of California, Berkeley, June 1998. In: Wolf S and Zilberman D (eds), *Knowledge generation and technical change: Institutional innovation in agriculture*. University of California, Berkeley, USA.
- Rivera WM and Cary J. 1997. *Privatizing agricultural extension*. In: *FAO. Agricultural extension: Reference manual*. FAO (Food and Agriculture Organization of the United Nations), Rome, Italy.
- Rivera WM and Schram SG. 1987. *Agricultural extension worldwide: Issues, practices and emerging priorities*. Croom Helm, New York, USA.
- Röling N. 1986. Extension and the development of human resources: The other tradition in extension education. In: Gwyn EJ (ed), *Investing in rural extension: Strategies and goals*. Elsevier, London, UK.
- Röling N and Jiggins J. 1994. Policy paradigm for sustainable farming. *European Journal of Agricultural Education and Extension* 7(1):23–44.
- Röling N and Pretty JN. 1997. Extension's role in sustainable agricultural development. In: *Improving agricultural extension: A reference manual*. In: Swanson BE, Bentz RP and Sofranko AJ (eds), *Improving agricultural extension: A reference manual*. 3rd ed. FAO (Food and Agriculture Organization of the United Nations), Rome, Italy.
- Rondinelli DA. 1987. Administrative decentralization of agricultural and rural development programs in Asia: A comparative analysis. In: Rivera W and Schram S (eds), *Agricultural extension worldwide*. Croom Helm, London, UK. pp. 22–57.
- Russell JFA. 1986. Extension strategies involving local groups and their participation, and the role of this approach in facilitating local development. In: Gwyn EJ (ed), *Investing in rural extension: Strategies and goals*. Elsevier, London, UK.
- Saito KA and Weidemann CJ. 1990. *Agricultural extension for women farmers in Africa*. World Bank Discussion Paper 103. World Bank, Washington, DC, USA.
- Samanta RK. 1994. They reap less than they sow. *The Hindu* (April), No. 7. Madras, India.
- Schultz J, Ray D, Claude F and Thomas T. 1996. *Albanian agriculture adjustment project. Extension workshop*. Alternative mechanisms for funding and delivering extension. World Bank, Washington, DC, USA.
- Schwartz LA and Kampen J. 1992. *Agricultural extension in East Africa*. World Bank Technical Paper 164, World Bank, Washington, DC, USA.
- Seevers B, Graham D, Gamon J and Conklin N. 1997. *Education through cooperative extension*. Delmar Publishers, Albany, New York, USA.

- Shiva V. 1991. *Most farmers in India are women*. FAO (Food and Agriculture Organization of the United Nations), New Delhi, India.
- Smith LD. 1997. *Decentralisation and rural development*. FAO/SARD. FAO (Food and Agriculture Organization of the United Nations), Rome, Italy.
- Spring A. 1985. The women in agricultural development project in Malawi: Making gender free development work. In: Gallin RS and Spring A (eds), *Women creating wealth: Transforming economic development*. Association for Women in Development, Washington, DC, USA. pp. 71–76.
- Spring A. 1986. Reaching female farmers through male extension workers in Malawi. In: *1985—Training for agriculture and rural development*. FAO (Food and Agriculture Organization of the United Nations), Rome, Italy.
- Staudt K. 1976. Women farmers and inequities in agricultural services. *Rural Africana* 29:81–93.
- Sulaiman R and Hall A. 2002. *Beyond technology dissemination—Can Indian agricultural extension re-invent itself?* NCAP Policy Brief 16.
- Sulaiman RV and Hall A. 2004. *Towards extension plus—Opportunities and challenges*. Policy Brief No.17. NCAP, ICAR, New Delhi, India.
- Sulaiman RV, Tahseen J and Ashok MS. 2003. *Cafeteria for women in agriculture*. Working Paper No.4. NCAP, ICAR, New Delhi, India.
- Swanson BE and Samy MM. 2002. Developing an extension partnership among public, private and nongovernmental organizations. *Journal of International Agricultural and Extension Education* 9(1):5–10.
- Swanson BE, Bentz RP and Sofranko AJ. (eds). 1997. *Improving agricultural extension: A reference manual*. 3rd ed. FAO (Food and Agriculture Organization of the United Nations), Rome, Italy.
- Thrupp LA. 1996. *New partnerships for sustainable agriculture*. World Resources Institute, Washington, DC, USA.
- Umali DL and Schwartz L. 1994. *Public and private agricultural extension: Beyond traditional frontiers*. World Bank, Washington, DC, USA.
- Umali-Deiningering D. 1996. New approaches to an old problem: The public and private sector in Extension. Presented at the extension workshop. Alternative mechanism for funding and delivering extension. World Bank, Washington, DC, USA.
- Umali-Deiningering D. 1997. The public and private sector in agricultural extension: Partners or rivals. *World Bank Research Observer* 12(2):203–224.
- Walker ST. 1990. *Innovative agricultural extension for women: A case study in Cameroon*. Women in Development Working papers. The World Bank. Washington, DC, USA.
- West EG. 1996. *Education vouchers in practice and principle: A world survey*. Human Capital Development Working Paper No. 64. World Bank, Washington, DC, USA.
- Wete F. 1991. New technology for transferring agricultural information. In: Rivera WM and Gustafson DJ (eds), *Agricultural extension worldwide: Institutional evolution and forces for change*. Elsevier Science publications, Amsterdam, the Netherlands.
- Wilson M. 1991. Reducing the costs of public extension services: Initiatives in Latin America. In: Rivera WM and Gustafson DJ (eds), *Agricultural extension worldwide: Institutional evolution and forces for change*. Elsevier Science publications, Amsterdam, the Netherlands.
- WORDOC. 1988. *Women in agriculture. African Notes*. (Special Number). Institute of African Studies, Ibadan, Nigeria.
- World Bank. 1990. *Agricultural extension: The next step*. Agriculture and Rural Development Department, World Bank, Washington, DC, USA.
- World Bank. 1995. *Participation sourcebook*. Washington, DC, USA.
- World Bank. 1996. *The World Bank participation source book*. The World Bank, Washington, DC, USA. Available at: <http://www.worldbank.org/wbi/sourcebook/sb0212.htm>
- World Bank. 1997. *From vision to action in the rural sector*. World Bank, Washington, DC, USA.
- Zijp W. 1993. Being a good communicator doesn't solve all of extension's problems. *Development Communication Report* 80(20).
- Zijp W. 1994. *Improving the transfer and use of agricultural information: A guide to information technology*. World Bank Discussion Paper 247. World Bank, Washington, DC, USA.
- Zijp W. 1996. *Promoting pluralism. Presentation to the extension workshop: Alternative mechanisms for funding and delivering extension*. World Bank, Washington, DC, USA.

Zijp W. 1998. Extension: Empowerment through communication. In: Wallace IR (ed), *Rural knowledge systems for the 21st century: Rural extension in western, central and eastern Europe. Proceedings of the symposium held at Reading, Cambridge and Edinburgh universities 6–17 July 1997*. AERDD, The University of Reading, Reading, UK.

3 Extension approaches, models and methods

3.1 Introduction

3.2 Extension approaches

3.3 Extension models

3.4 Extension methods

3.5 From government owned R&E to innovation systems

3.1 Introduction

Extension has traditionally been defined as the delivery of information and technologies to farmers. This leads to the technology transfer model of extension, seen by many as the main purpose of agricultural extension (Moris 1991). This is based on the idea that 'modern' knowledge and information is transferred through extension agents to recipient farmers. Swanson et al. (1997) defined agricultural 'extension', as extending relevant agricultural information to people. The World Bank defines extension as 'the process of helping farmers to become aware of and adopt improved technology from any source to enhance their production efficiency, income and welfare' (Purcell and Anderson 1997).

It might be useful here to make a distinction between approaches, models and methods as used in this chapter. Throughout literature, you will find that the terms approaches and models are used interchangeably and there is no watertight distinction between how they are used.

Approach

The approach is the essence of an agricultural extension system. The approach is the style of action within a system and embodies the philosophy of the system. It is like a doctrine for the system, which informs, stimulates and guides such aspects of the system as its structure, its leadership, its program, its resources and its linkages.

Each approach can be characterized by seven dimensions:

1. The dominant identified problem to which the approach is to be applied as a strategic solution;
2. The purposes it is designed to achieve;
3. The way in which the control of program planning is carried on, and the relation of those who control program planning to those who are the program's main target audience;
4. The nature of the field personnel including such aspects as their density in relation to clientele, levels of training, reward system, origin, gender and transfers;
5. The resources required and various cost factors;
6. The typical implementation techniques used;
7. How it measures its success.

Model

A model may be defined as a schematic description of a system, or phenomenon that accounts for its known or inferred properties and may be used for further study of its characteristics.

Methods

Methods refer to the techniques used by an extension system as it functions. For example demonstration, visit by an extension agent to a farmer etc.

Having tried to make a distinction between the three terminologies, the following sections outline some of the predominant approaches, models and methods employed in agricultural extension worldwide.

3.2 Extension approaches

This section describes different extension approaches that are in use. What is to be noted, however, is that in actual practice, any agricultural extension system, at a particular time, will emphasize one approach over another, but it will usually have some characteristics of other types. Thus, the approach is the starting place for a particular style of action, not the ending place. It is the essential ideology which differentiates that particular approach from others. Also each approach has certain advantages and disadvantages. Since all approaches described here are merely different approaches to the same agricultural extension phenomenon, there are common characteristics that all of them share. For example:

- all function through non-formal education
- all have content related to agriculture
- all use communication techniques and aids
- all seek to improve the capabilities of rural people.

Extension comes in many sizes and shapes. Axinn (1988) identified eight different approaches to extension work. Although the following classification, made primarily for agriculture, is not complete and the distinctions between the types are not absolute, it gives an idea of the possibilities and opportunities that exist for the extension planner and for the policy and decision-maker at the national level (Rivera et al. 2001). The approaches are briefly summarized below.

(a) The general agricultural extension approach

This approach assumes that technology and knowledge that are appropriate for local people exist but are not being used by them. The purpose is to help farmers increase their production. The approach is usually fairly centralized and government-controlled. Planning is done on a national basis by the central government 'which knows better than farmers'. This is a typical case of top-down planning. Field personnel tend to be large in number and high in cost, with the central government bearing most of the cost. The rate of adoption of important recommendations and increases in national production are the measures of success. A survey of agricultural extension programs indicated that agricultural extension generally was part of the Ministry of Agriculture, with field extension officers at the bottom of the hierarchy and a minister at the top. This approach lacks two-way flow of information. It fails to adjust messages for each different locality. Only farmers who seek advice benefit and these tend to be large-scale wealthier farmers. This approach does provide farmers with information on a number of production alternatives from one single source.

(b) The commodity specialized approach

The key characteristic of this approach groups all the functions for increased production—extension, research, input supply, marketing and prices—under one administration. Extension is fairly centralized

and is oriented towards one commodity or crop and the agent has many functions. Planning is controlled by a commodity organization for the purpose of increasing production of a particular commodity. Highly trained scientific personnel equipped with expensive vehicles and field scientific apparatus are employed. Techniques recommended must produce financial benefits for farmers, and be demonstrable on farmers' own fields. New inputs must be accessible, a credit scheme established, and the ratio between farm-gate inputs and commodity prices considered. Technology tends to be appropriate and distributed in a timely manner because it focuses on a narrow range of technical concerns. Interests of farmers, however, may have less priority than those of commodity production organizations.

(c) The training and visit approach

Training and Visit (T&V) is one of the best known of the recent approaches, which was adapted by all of the East African countries to support the development of state extension services during the early 1990s. The training and Visit (T&V) system was operating in more than 40 developing countries. It is a system, which emphasizes simplicity in both objectives and operations. It provides continuous feedback from farmers to extension agents and to research staff; it allows for continuous adjustment to the farmers' needs. It has spread rapidly around the world because it is seen as an effective means of increasing farm production and a flexible tool at all levels of any agricultural ministry's operation.

The purpose of the training and visit approach (often called T&V) is to induce farmers to increase production of specified crops. This fairly centralized approach is based on a rigorously planned schedule of visits to farmers and training of agents and subject matter specialists. Close links are maintained between research and extension. Agents are only involved in technology transfer. Planning is controlled centrally and field personnel tend to be numerous and dependent on central resources. Success is measured in terms of production increases of the particular crops covered by the program. The T&V approach is again a top-down approach. The emphasis is on disseminating unsophisticated, low-cost improved practices, and teaching farmers to make best use of available resources. There is pressure on the government to reorganize it into a more integrated service, and to send extension officers into the field to meet with farmers. It provides closer technical supervision and logistic support, but at a high cost. Actual two-way communication is lacking and there is little flexibility.

This builds on a combination of the individual and group approaches. In this system, the extension staff are trained every fortnight on relevant extension issues for that time of the year and the staff then extend these messages to contact farmers who receive special attention. Field days and other visits are arranged on the farms of contact farmers so that their neighbours can also benefit from the knowledge they have gained. Under T&V, the extension system changed its way of reaching out to farmers by using agents who focused mainly on technology diffusion (Picciotto and Anderson 1997). T&V extension agents would meet with a small group of 'contact' farmers who were expected to disseminate information to the members of their respective communities and convey farmer's opinions back to the agents, thus creating a feedback mechanism absent in the prior system (Birkhaeuser et al. 1991). T&V did, however, have its critics. With continued budgetary crises of less developed countries, some argued that it was too expensive and impossible to implement over extensive regions. Highly dispersed farmers could never establish frequent contact with extension agents. And their needs varied widely and could not be addressed with a single, inflexible technology package (Picciotto and Anderson 1997; Feder et al. 2001).

With T&V, the frontline worker becomes the vital link in a chain, which ensures two-way communication between research institutions and farmers. The T&V system focused on regular visits and making the

extension agent responsible for diffusion in target farmers and region. The system also upgraded the technical capacity of the extension service through the creation of the regional specialist positions to give inputs to the field agents in direct contact with the farmers. Unfortunately, the T&V system took the emphasis off the adequacy of the technology and put it on organizational questions and increased the costs of operation by focusing on increasing field visits and upgrading the technical capacity.

(d) The farming systems development approach

This approach assumes that technology which fits the needs of farmers, particularly small-scale farmers, is not available and needs to be generated locally. A key characteristic of this type of extension is its systems or holistic approach at the local level. Planning evolves slowly and may be different for each agroclimatic farm ecosystem. This approach is implemented through a partnership of research and extension personnel using a systems approach. Close ties with research are required and technology for local needs is developed locally through an iterative process involving local people. Analyses and field trials are carried out on farmers' fields and in homes. The measure of success is the extent to which farm people adopt technologies developed by the program and continue to use them over time. Control of the program is shared jointly by local farm families, extension officers, and researchers. Advantages of this system include strong linkages between extension and research personnel, and the commitment of farmers to using technologies they helped to develop. Costs can be high, and results can be slow in coming.

Farming systems/participatory methods

Researchers in developing nations first recognized the need to apply new thinking to the 'problem' of slow or non-adoption (Dunn et al. 1996). Small-scale farmers living in risk-prone, complex environments are often unable to take advantage of many of the technologies developed on research stations for large-scale farms. Researchers working around the world noticed the unique problems of the small-scale farmer livelihood system, and developed strategies to solve these that are now known as the farming systems approach (Collinson 2000; Escobar 2000; Harwood 2000; Norman 2000; Hildebrand 2001).

Starting in 1982, development practitioners began emphasizing the notion that research activities should begin and end with farmers. Rhoades and Booth (1982) coined the term 'farmer-back-to-farmer'. Chambers developed this into the 'farmer-first' philosophy (Chambers 1990, as cited in Dunn et al. 1996). Along with these were other slogans: 'Putting People First' (Cernea 1985) and 'Farmer Participatory Research' models (Farrington and Martin 1988, as cited in Dunn et al. 1996), on-farm research with farming systems (OFR/FSR) perspective of CIMMYT, and on-farm client-oriented research (OFCOR) of ISNAR. The linear model does not show the many innovations that come from sources other than formal research. Bunch (1985) and many others (described in Haverkort et al. 1991) have shown that farmers are experimenters.

In response to concern for small-scale farmers, farming systems research and extension evolved simultaneously on three continents (Latin America, Africa and Asia) during 1965–80 (Hildebrand 2001). This system was marked by greater emphasis on smallholder farmers and their livelihood systems, as researchers realized that such people were not being reached effectively with the traditional extension approaches. They thus began to use what is known as the farming systems approach to research and extension. In eastern Africa, this was initiated through the work of Michael Collinson with CIMMYT (Collinson 2000). Farming systems is a holistic approach that looks at the entire farm as a system with

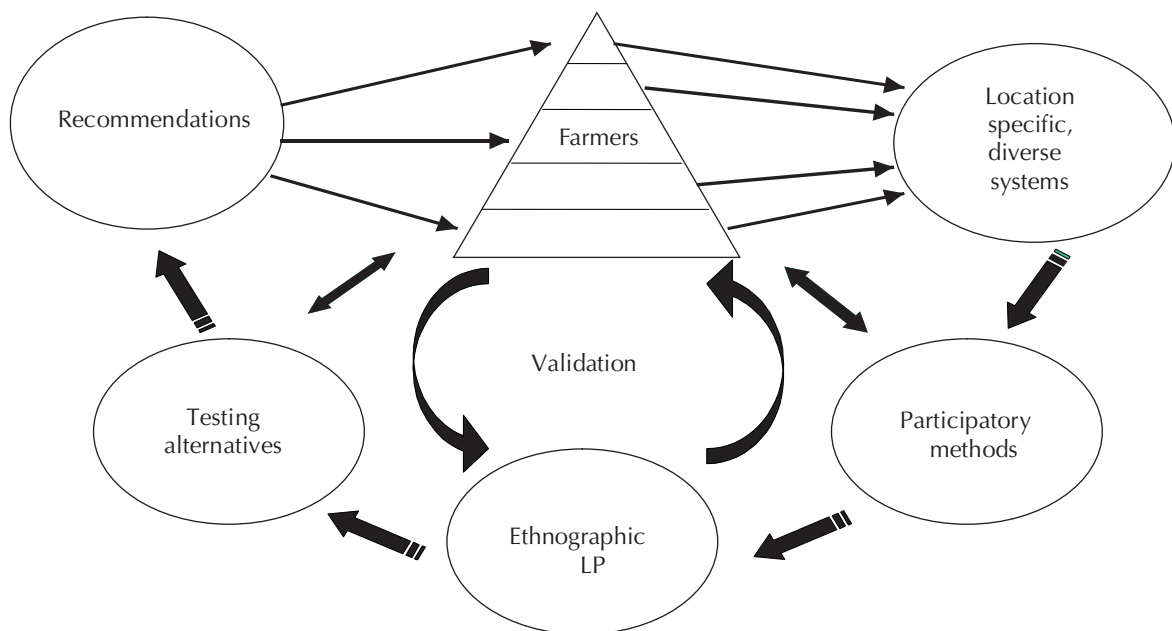
various subsystems. It provides for greater dialogue with and input from farmers, and for enhanced linkages between research, extension and farmers. This model was marked by participation at the farm level (through farmer input on research and on-farm trials) and by interdisciplinary linkages and a systems approach to extension.

The farming systems approach (Norman 2002) was characterized by:

- a holistic approach viewing the farm as a whole
- involvement of farmers and their priorities
- research reflecting the various subsystems' interactions and linkages and
- reliance on informal surveys or 'Rapid Rural Appraisal (RRA)'.

Farmer participatory extension then evolved because of emphasis on the needs of resource-poor farmers, gender equity and the value of indigenous knowledge systems. Diversity is heavily encouraged in this type of system, and linkages are numerous and diverse.

Current dissemination thinking takes a much more participatory, farmer-centred approach than the diffusion of innovations theory. Farmers are involved in every aspect of technology, from generation to testing to dissemination. However, it has not always been this way. The emerging extension methodology for technology dissemination based on systems oriented participatory approach is presented in Figure 3.1.



Adapted from Bastidas (2001).

Figure 3.1. Farming systems' emerging methodology on technology transfer.

The farming systems approach also emphasizes strong on-farm research components where farmers, extension agents and researchers work together as a team.

In participatory approach, participation is concerned with the organized efforts to increase control over resources and regulative institutions in given social situations on the part of groups and movements of those hitherto excluded from such control (Pearse and Stifel 1979). Participation is a process through which stakeholders influence and share control over development initiatives and the decisions and resources that affect them (World Bank 1994). It can also be seen as a process of empowerment of the

deprived and the excluded in terms of political and economic power among different social groups and classes.

In this respect, community participation is an active process by which beneficiary or client groups influence the direction and execution of a development project with a view of enhancing their well being in terms of income, personal growth, self-reliance, or other values they cherish (Paul 1987). Moreover, participatory development stands for partnership, which is built up on the basis of dialogue among the various actors, during which the agenda is jointly set, and local views and indigenous knowledge are deliberately sought and respected. Thus people become actors instead of being beneficiaries (OECD 1994).

The role of FSR or OFR/FSP in technology development and dissemination is shown in Figure 3.2.

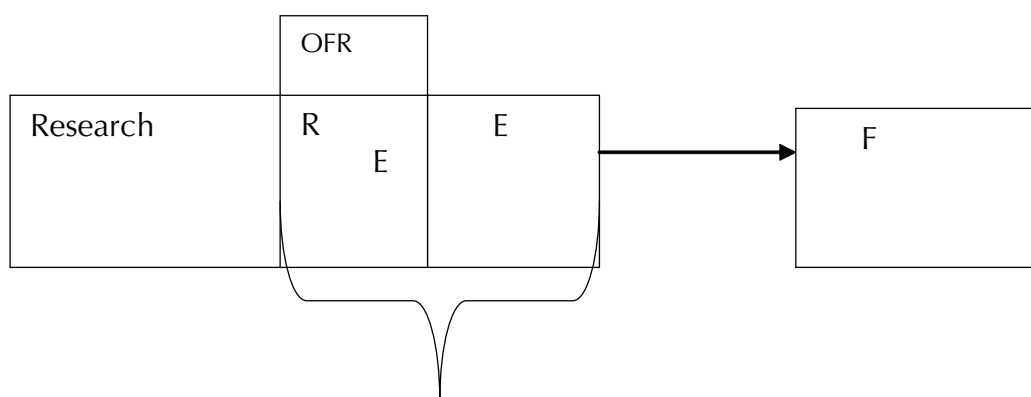


Figure 3.2. *The role of FSR/OFR in technology development and dissemination.*

(e) The participatory agricultural extension approach

This approach assumes that farmers are skilled in food production from their land, but their levels of living could be improved by additional knowledge. Active participation by farmers themselves is necessary and produces a reinforcing effect in group learning and group action. Much of the work is through group meetings, demonstrations, individual and group travel, and local sharing of appropriate technologies. This approach often focuses on the expressed needs of farmers' groups and its goal is increased production and improved quality of rural life. Implementation is often decentralized and flexible. Success is measured through numbers of farmers actively participating, and the continuity of the program. There is much to be gained by combining indigenous knowledge with science. Expressed needs of farmers are targeted. The system requires that extension workers, who are also animators and catalysts, stimulate farmers to organize for group efforts. Local people evaluate their own programs and play a role in establishing research agendas.

The participatory agricultural extension approach costs less, fits needs well, and is more efficient. However, it is more work for extension agents to organize and motivate farmers. It requires agents to live and to socialize with farmers. Where a government job is seen as a reward, the 'hardship' implied by this approach dooms it to failure. The agent is present only 'part time' and has no personal stake in the outcome.

Participatory Extension Approach (PEA)

Agricultural extension services link research workers, policy makers, and other providers of support services with the farmers. They play a dual role of providing innovative knowledge as well as feedback.

With the realization of the need for empowerment, local ownership and the pluralistic approach to service provision, the role of the traditional public sector extension services is gradually changing. The extension staff, rather than being mere agents for concepts or technologies imposed from outside, need to become facilitators/catalysts, helping communities achieve the goals they have defined. This section describes an approach called Participatory Extension Approach (PEA) that emerged from the community development activities in Zimbabwe (AGRITEX 1998).

Although termed an approach, PEA is included with other emerging FSA-related methods because it is sufficiently specific with respect to extension to be integrated within the FS approach.

Characteristics of the participatory extension approach

PEA, as developed and understood in Zimbabwe, is an extension approach and concept which involves the transformation in the way extension agents interact with the farmers. Community-based extension and joint learning is central to PEA. The PEA process emphasizes the participatory facilitation role of extension staff. Main characteristics of PEA are as follows:

- It integrates community mobilization for planning and action with rural development, agricultural extension and research;
- It is based on an equal partnership between farmers, researchers and extension agents who can all learn from each other and contribute their knowledge and skills;
- It aims to strengthen rural people's problem-solving, planning and management abilities;
- It promotes farmers' capacity to adopt and develop new and appropriate technologies/innovations;
- It encourages farmers to learn through experimentation, building on their own knowledge and practices and blending them with new ideas, in other words, 'action reflection' or 'action learning'; and
- It recognizes that communities are not homogeneous but consist of various social groups with conflicts and differences in interests, power and capabilities. Each group then makes its collective decisions, and also provides opportunities to negotiate between groups (AGRITEX 1998).

The role of extension is to facilitate this process. Under the emerging model, good extension work means talking with farmers, working with farmers, learning from farmers and suggesting new approaches to farmers. A number of lessons have been developed based on past experiences. The key findings are (AGRITEX 1998):

- Outsiders are rarely able to determine the 'best practices' for rural people. Farmers are the only people who can make effective decisions about how to manage their farms within the many environmental and social constraints they face. There is also a multitude of social and cultural factors affecting how a farmer will choose to farm;
- Building of farmers' management and problem solving capacity requires joint learning by doing in the field;
- The spreading of innovations depends on the interaction between rural people and their social organizations;
- The role of the extension worker changes from a teacher to a facilitator. Facilitation means providing the methodology for the process; facilitating communication and information flow; and providing the technical backup options. The extension worker in fact coordinates and organizes the knowledge acquisition from several sources. Another role of the extension worker is to train

the community's own facilitators. In addition, the extension worker documents farmer knowledge and experience and produce simple guidelines for the farmers;

- The research agenda is fuelled by farmers' needs, except in the case of basic research.

The main difference between the Transfer of Technology model for extension and the participatory extension method are summarized in Chambers (1993). Unfortunately Chambers (1993) assumed a linear technology development and transfer model. However, if one considers the FSA to technology development and transfer and participatory extension methods, the differences are not that significant. The PEA process emphasizes the participatory facilitation role of extension staff.

There are four major phases of PEA process. This process and the related tools are described in detail in Chapter 5. PEA is a continuous process of learning and does not end with the four phases identified. The cycle repeats itself but with a different set of problems, as depicted in Figures 3.3 and 3.4.

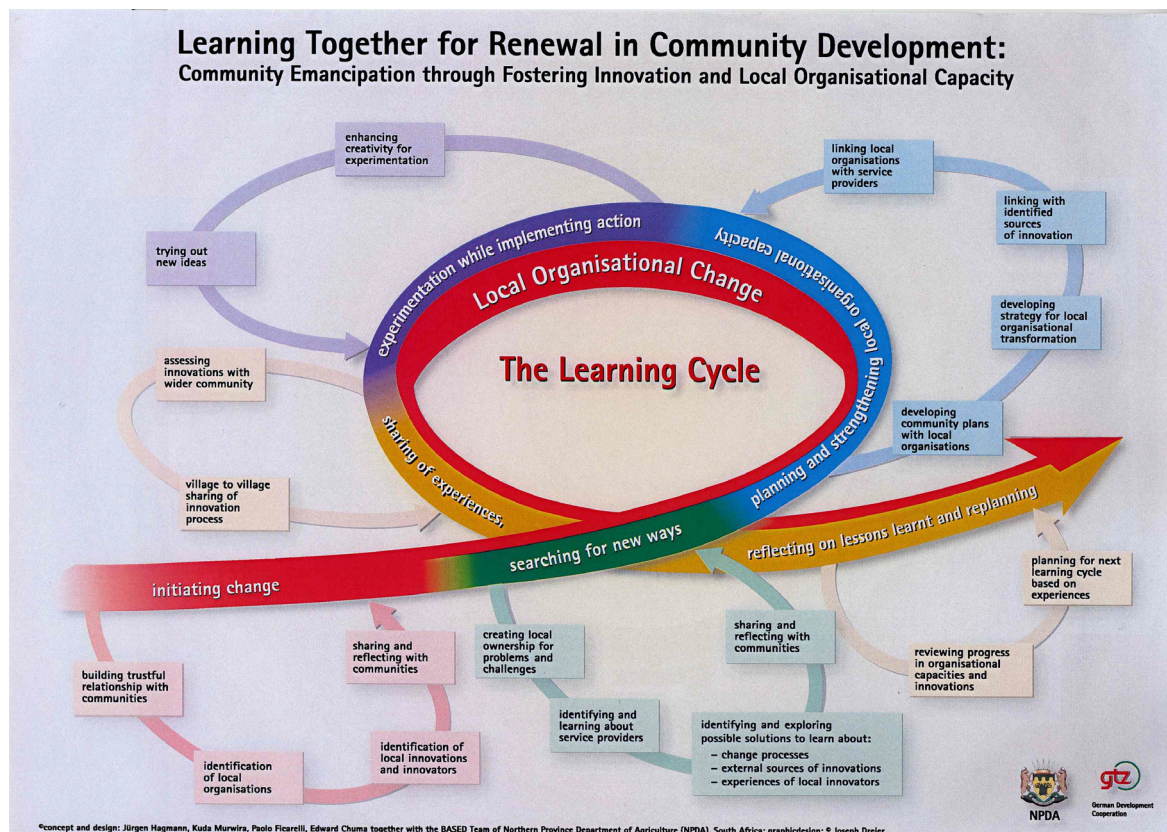
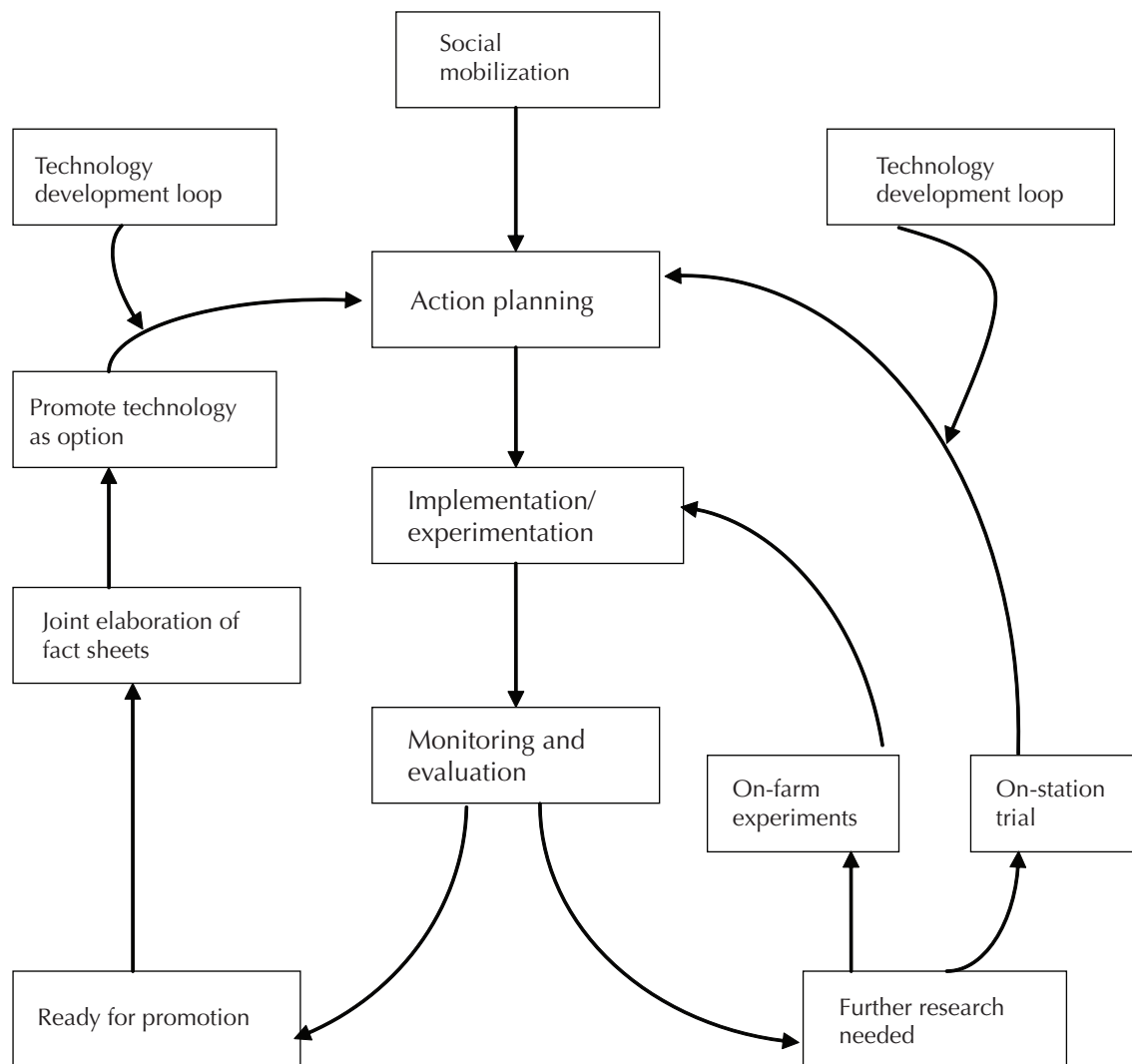


Figure 3.3. The PEA cycle and its four main phases.

(f) The project approach

This approach concentrates efforts on a particular location, for a specific time period, often with outside resources. Part of its purpose is often to demonstrate techniques and methods that could be extended and sustained after the project period. It uses large infusions of outside resources for a few years to demonstrate the potential of new technologies. Control is at the central government level and there are often considerable financial and technical inputs from an international development agency. Short-term change is the measure of success. In the aquaculture project in Nepal, for example, a loan from the Asian Development Bank was used by the Ministry of Agriculture to support extension work by fisheries officers in many different locations throughout the country. They were able to introduce pond fisheries through an effort which combined the project approach with the specialized commodity

approach. One problem with this approach, however, is that a flow of ideas outside the project rarely occurs (Axinn 1988).



Source: AGRITEX (1998).

Figure 3.4. Community-based PEA: Process and feedback linkages.

Integrated approaches aim at influencing the entire rural development process. Extension is only one though often crucial element in this strategy which targets the entire population in a given area but emphasizes work with disadvantaged groups. Integrated approaches are generally implemented in the form of large-scale and foreign-funded projects aiming at alleviating mass poverty in rural areas on the basis of ‘a simultaneous improvement in the utilization of natural resources and of human potential’ (Rauch 1993, 6). Measures to promote production are coupled with a strong emphasis on self-help. The underlying concept is typically multi-sectoral.

Evaluations of more than a decade of integrated rural development (IRD) projects have revealed serious shortcomings in reaching the goal of mass poverty alleviation (IBRD 1987; BMZ 1990). Sizeable numbers of the poor were not reached by project activities, nor were positive effects consolidated on a sustainable basis. Project deficiencies were in part management related and very often due to a serious

underestimation of the great complexity of multi-sectoral programs with ambitious goals. The disregard of the target group principle and of due consideration for framework conditions (economic and institutional) played an even more important role, as did the lack of compatible technical solutions.

Recent efforts to improve regional rural development (RRD) projects and enhance chances for a broad and sustainable impact (Rauch 1993) are relevant for all general extension approaches. The key concept is the availability of locally adapted solutions established on a common basis. This requires not only participatory technology identification, test and dissemination, but also an active role by the change agency in mediating between different institutions involved and their interests. A particular emphasis is laid on dealing with adverse framework conditions, explicitly taking them into account and attempting to influence them in favour of clients. Finally, in order to achieve these improvements, new efforts must be made to specify and operationalize (extension) objectives and concepts (sustainability, participation, gender-specific target-group approach and poverty alleviation).

(g) The cost sharing approach

This approach is based on local people sharing part of the cost of the extension program. Its purpose is to provide advice and information to facilitate farmers' self-improvement. It assumes that cost-sharing with local people (who do not have the means to pay the full cost) will promote a program that is more likely to meet local situations and where extension agents are more accountable to local interests. Control and planning is shared by various entities and is responsive to local interests. Success is measured by farmers' willingness and ability to provide some share of the cost, be it individually or through local government units. Problems may arise if local farmers are pressured into investing in unproven enterprises.

(h) The educational institution approach

This approach uses educational institutions which have technical knowledge and some research ability to provide extension services for rural people. Planning is controlled by those determining the curriculum of the educational institution. Implementation is through nonformal instruction in groups or individuals through a college or university. Attendance and the extent of participation by farmers in agricultural extension activities are the measures of success. Ideally researchers learn from extension personnel who, in turn, learn from farmers. However, this rarely occurs in practice. The advantage of this approach is the relationship between specialized scientists and field extension personnel.

While the Cooperative Extension Service (CES) of the United States is still the only system in which the main extension function remains within the university, some developing countries, notably India, have integrated educational institutions into practical extension work. Within the United States of America, state universities have traditionally cooperated with local counties and the US Department of Agriculture in doing extension besides education and research. Within the last 130 years, extension goals of the land-grant colleges have shifted from practical education to technology transfer and, more recently, to a much broader concept of human resource development.

With the emergence of strong private and other public sector research and development organizations and dramatic changes within the agricultural production sector, CES is facing new challenges with regard to coordination and cooperation. Apart from its traditional roles, *networking* will become a primary role (Bennet 1990). In this model, industry as well as intermediate and end users of knowledge become part of the extension system.

While in most countries, the main contribution of educational institutions to extension will be the training of qualified, dedicated, and responsible personnel, some Indian agricultural universities have come close to the US model without taking over the full load of extension work. In the field, they have taken over functions which are only inadequately performed by the ministry, thus supporting general extension work. Remarkable features are direct assessment of clients' needs, user-oriented research, quality training for state personnel, and a strong linkage between academic education and field practice. Models vary from state to state. The Punjab Agricultural University (PAU) has its own multidisciplinary extension team in each district, engaged in adaptive research, training and consultancy. Backed up by extension specialists on campus, they are transmitters and receivers of experiences from researchers, farmers and state extension workers. At PAU, a unique system of processing these experiences is practised. Regular workshops are held which unite university and department staff from research and extension together with outstanding farmers. New findings and feedback are presented, evaluated and published as a 'Package of Practices' to be used by all extension staff for the next season (Nagel 1980).

In the Philippines, which works with ministry-operated extension, university field contacts have been combined with practical development work. The University of the Philippines at Los Baños (UPLB) has its own 'social laboratory' in rural areas. Transfer of ideas is not limited to production technology, but includes the testing of communication strategies as well as helping farmers to organize themselves. Experiences are channelled back into UPLB teaching and research (Axinn 1988, 102–103).

3.3 Extension models

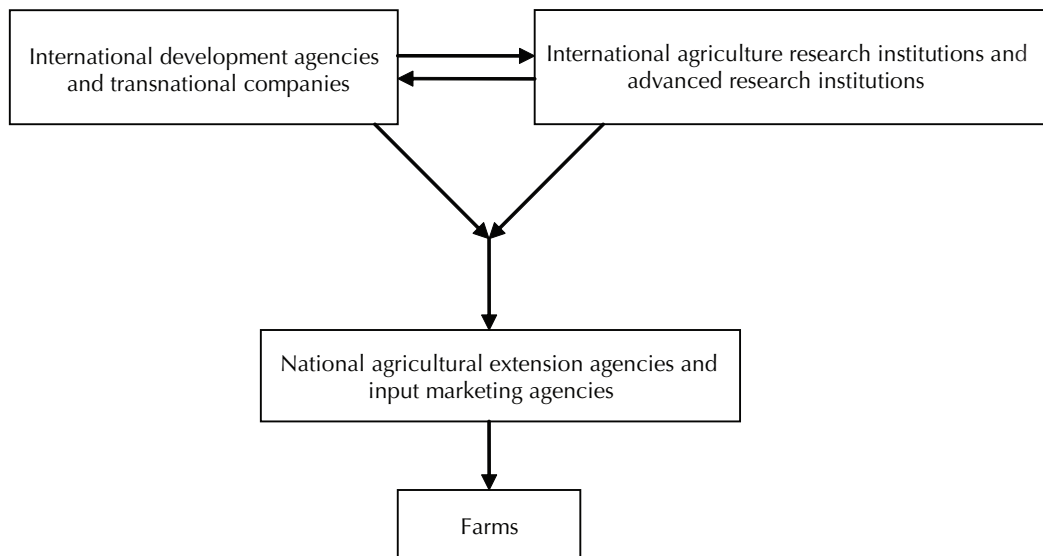
Over the years, a number of models have been used to enhance the effectiveness of extension services and service delivery. In this section we attempt to describe the various models of extension. However, it is worth noting: in the real world one would find a combination of elements of various models and approaches being used simultaneously.

Gemo et al. (2005) listed six basic extension models in Africa, all of them imported from other continents.

3.3.1 Technology transfer model

In practice, extension organizations everywhere pursue the overall goals of technology transfer and human resource development, though the emphasis will differ. Within each organization there is a mix of objectives, and within countries there is often a mix of organizational patterns. Figure 3.5 shows the stakeholders and agents involved in the agricultural technology transfer model.

The conventional provider of extension, the state, has typically used top–down, transfer of technology (TOT) methods for extending new technologies. Top–down methods characterized the United States extension model, which was instituted by many colonial governments in Africa. In the TOT approach, technologies are generated at research stations and diffused to farmers using the extension service (Put 1998). Not only technologies but also intangibles such as power, prestige and skills are located at these centralized stations (Put 1998). Technologies are spread vertically in this top–down approach. The TOT approach is often biased toward better-endowed farmers whose fields and infrastructure are more like those of the research stations (Chambers and Ghildyal 1985).



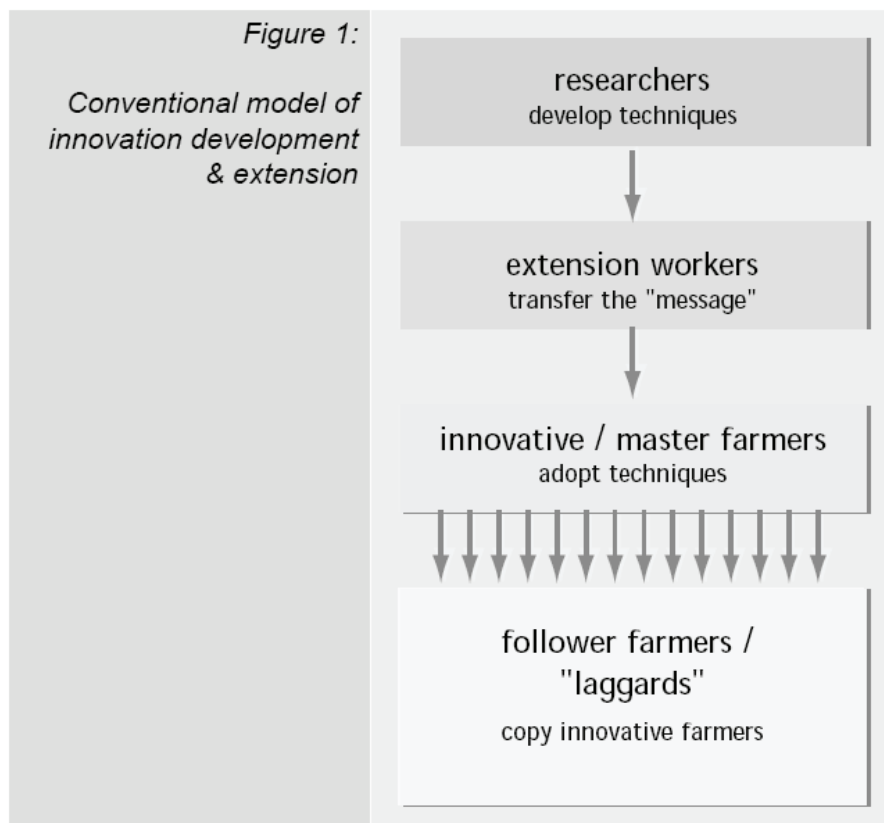
Adapted and modified from Thrupp et al. 2000.

Figure 3.5. Stakeholders and agents involved in the agricultural technology transfer model.

In many developing countries, the TOT model has been the prevalent practice for developing and spreading innovations. It is based on the assumption that transfer of technology and knowledge from scientists to farmers will trigger development. Applied to agriculture, this model assumes that farmers' problems can be solved by people and institutions that have this 'modern' knowledge. Farmers have often been considered the main constraint to development, as 'mismanagers' of their resources, rather than the potential initiators of a solution. Through this approach it has been the researcher's task to identify, analyse and solve farmers' technical problems. Solutions have normally been developed at research stations. The results have then been transferred as messages to farmers via the extension worker, who is the link between researchers and farmers. His or her role has been to assist farmers in putting the ready-made technology into practice (Figure 3.6).

Farmers may have been persuaded through incentives or forced by authoritarian extension workers to adopt new practices or innovations (new ways of doing things). Extension workers as well as farmers have thus been passive recipients of technological recipes in a top-down flow of information. These technologies have often only addressed the symptoms of a problem rather than the root cause of it. Often they have failed to address farmers' needs and constraints which are interlinked with the social set-up and its implications.

This top-down model creates a rigid hierarchy which discourages the feedback of information. Researchers work independently of farmers and extension workers, resulting in a poor understanding of farmers and the opportunities and constraints they face. The transfer approach is fragmented, both institutionally and in terms of disciplines. Research concentrates on technology and researchers and extensionists are seen as technical agents. Social competence is not required as complex socio-organizational issues (e.g. land-use regulations, power structures, conflict resolution mechanisms) are neglected or reduced to a technical level.



Source: AGRITEX (1998)

Figure 3.6. *Conventional model of innovation development and extension.*

The extension workers' role is to teach and demonstrate to innovative 'contact' or 'master' farmers how to use new technologies. Once innovative farmers have adopted the new technologies, it is assumed that other 'laggards' or 'follower' farmers will copy them and the technology will diffuse to the majority of farmers. In practice, this assumption often proves invalid. As observed in many countries, in most cases, the 'laggards' are jealous of the more advanced people who are then victimized, rather than copied. Knowledge may also be considered a strong basis of power. Information as well as innovations may thus not necessarily be shared outside the elitist 'club', close relatives and best friends.

Transfer of technology approaches are strongly linked to the diffusion of innovations philosophy. Diffusion of innovations theory says that technologies are communicated over time among the members of a social system, and adopted according to various characteristics of both the technology and the user (Rogers 1995). The diffusion of innovations model was focused on a very linear process of technology development. Rogers' model has been critiqued for this and for other shortcomings, such as the pro-innovation bias, blame of farmers for 'non-adoption' of technologies, lack of recognition of farmer innovations, and focus on the change agency/change agent instead of the ultimate end users of technology (the farmers).

The results of this approach to innovation development and diffusion are well known:

- The adoption rates of technologies remain low in most cases, except in cases where these technologies were implemented with coercion (like contour ridges during the colonial era). In this case, however, the effectiveness of these technologies often remained low and the success was not sustainable.

- The performance of researchers' technologies is often disappointing under farmers' management. Farmers are then blamed for incorrect implementation. Often, however, these technologies were not appropriate for the different levels of farmers.
- Social, cultural, organizational and power issues at community level are neglected, although experience shows that most often they are the major stumbling block for successful development.
- Local people's vast knowledge is not recognized or valued. This discourages rural people and reduces the contribution to their own development as they feel inferior.

Given its failure, there was an obvious need to re-think this system to develop more effective approaches. More recent thinking has developed models that are more iterative, dynamic and cyclical in nature. Rogers himself moves away from linear technology transfer with the convergent model in the latest version of his theory on the diffusion of innovations (Rogers 1995). Moreover, the theory of innovations and related transfer-of-technology model has tended to work better in developed rather than developing nations, but even within developed nations, the perceived process has evolved into the more iterative model. In the iterative model, much more focus is on the endogenous nature of innovations. The linear model originally proposed by Rogers works better when there are limited recommendation domains for the technology. Technologies can then be recommended in 'blanket' form.

3.3.2 The public extension model

Inherited from colonial powers in most colonies and then dramatically increased in size following independence in the 1960s and 1970s. These systems are now characterized by large sized systems constrained by lack of basic operating funds.

Shortly before or after independence, organizing agricultural extension work under the wing of the ministry of agriculture seemed to be an ideal solution for many African and Asian governments. All options for reaching large numbers of clients and serving their needs in terms of quality information and assistance appeared to be open. The original colonial model combined research and extension within the same organization. All important aspects of smallholder agriculture—plant production, animal husbandry, home economics—could be attended to as the ministry established respective sections under its jurisdiction. The fact that the ministerial hierarchy followed the country's territorial subdivision, allowed the systematic expansion of the system 'down' to the village. The generalist nature of field extension staff functions corresponded to the set of problems faced by non-commercial growers. To cater to specific needs—in terms of technology or in terms of target groups—specialists could be employed. Thus clientele included in principle all persons engaged in agriculture. Commercial service and support organizations lacking, village-level extension staff could be expected to supplement information by rendering services necessary to apply it productively. A uniform and nationwide organizational pattern seemed to facilitate information flow, including the infusion of expatriate expertise, and corrective measures whenever weaknesses were identified. Public interest was to guide goal setting, program formulation and the implementation of fieldwork.

A review of the last thirty years of extension work in Africa and Asia shows that reality is quite different (Moris 1991). The reasons for failure are complex and manifold and cannot be reduced simply to incompetence or the ill-will of national governments.

One reason is the contradictory nature of goals. Public interest implies serving farmers *and* the urban population, securing subsistence production *and* promoting cash crops for export, reaching the masses of rural households *and* serving the needs of specific groups, extending assistance to high-potential *and*

disadvantaged producers. In short, priorities will have to be set, and these are all too often pro-urban in terms of price policy, favouring innovative individuals within the modern sector, neglecting poorer strata, and forgetting about women farmers.

In many ways, the hierarchical and highly bureaucratic way in which the services are organized hampers a full realization of their potential. Priority setting for research is rarely based on extension field evaluations because the system does not foster critical upward communication.

The way in which technical (and other) knowledge is transformed into field messages frequently leads to distorted and outdated information.

In the eyes of the ministry, extension has never been a purely educational activity. This is a legitimate view as long as the different functions to be performed by extension personnel are compatible and basically client oriented (such as helping to organize input supply).

Non-educational activities may include anything from statistical data collection to attending to foreign visitors. Incompatible with and clearly detrimental to regular extension work are such activities as supervising credit repayment, policing disease control measures, organizing 'voluntary' community work and electioneering.

Ministry-based extension has been unable to reach a majority of its potential clientele for economic, socio-psychological and technical reasons. Even dramatic quantitative increases in personnel—more staff closer to the farmer—have not produced manageable client-to-agent ratios. In recent years, the trend has even been negative. Financial constraints have produced a strong pressure to reduce staff, and the field level has been hit hardest. Those remaining have little if any material resources left to maintain mobility.

In addition, many extension workers select the more responsive section of their clientele. They may have to fulfil production plans, they may want to improve job satisfaction or status, or they may simply be prejudiced against certain target groups. Lastly, extension often has little to offer in terms of messages to large sections of the rural population. Adequate and location-specific answers to a farmer's problem are often not available because it has not been a research concern or the solution has simply not reached the field.

Today's situation is aggravated by two additional aspects which refer to the internal structure of the service: management problems and lack of control from below. Ministry extension employs thousands of persons working under a wide variety of circumstances. Decision-making and management are highly centralized and formalized. Extension fieldwork, on the other hand, demands location-specific, flexible and often quick decisions and actions. Managing the 'invisible' man or woman (Chambers 1974) must be highly ineffective as long as he or she is expected to receive and execute orders.

All these problems are well known, and criticism has come both from within and outside the ministry. What has been lacking is organized feedback from clientele. Farmers may show their discontent by refusing to cooperate with extension, but they have virtually no way of influencing institutional reforms.

3.3.3 Commodity extension model

This model was pioneered among smallholders producing cotton in Mali and other Francophone countries 50 years ago.

Next to the ministry-operated general approach, commodity-based extension run by governments, parastatals, or private firms is the most frequent extension method. Clients may be dispersed over a large area or closely connected, as in the case of large, centrally operated irrigation projects. Commodity-based extension is the predominant feature in many francophone countries of Africa (Schultz 1973), but is also strong in other countries with commercial or export crops.

The original rationale was the generation of revenue as well as the assured supply of tropical products for the colonial powers. Today, goals are still clearly and intentionally production and profit oriented. All aspects of producing and marketing a particular crop are vertically integrated, spanning the whole range from research, advice and material support given to farmers, to organizing marketing and even exports. Proponents of the approach argue that, by infusing modern technologies and monetary incentives into traditional farming, a cumulative chain of effects is triggered, thus contributing to overall development.

Advantages in terms of organizing the extension function seem obvious. One generally works with well tested technologies. Objectives and targets can be clearly defined and the organizational structure kept simple. The focus on only one or two crops facilitates training of extension workers who are agents of the society or board concerned. Control of agents and farmers is easy, because they are judged in terms of defined targets.

A closer look at these advantages reveals that they are largely defined from the perspective of the commodity organization. This poses no problem as long as organizational and clients' goals are identical, as was the case for coffee, tea, or sisal boards in the private plantation sector. For small farmers, the situation may be quite different. The rigidity of the system leaves little room for incorporating farmers' needs. The border between control and coercion is often crossed, for example, when farmers are forced to plant commercial crops at the expense of traditional subsistence crops. Extension workers are regarded as successful once they have brought farmers to producing 'what and how' the organization wants. The obvious advantage of guaranteed marketing does not automatically entail security for the agricultural producer. Farmers cannot react quickly to price fluctuations, and in some cases quality standards are arbitrarily set in order to increase personal or organizational profits. Many governments have used the approach to excessively extract revenue by dictating low farm-gate prices.

Strengths as well as limitations of the commodity approach lie in its narrow focus. It is useful in terms of technology transfer but leaves out important public interest issues (such as environmental protection), as well as target groups (such as non-commercial producers). A successful combination of general and commodity-based extension at the national level, as practised in East Africa, demands clear policy goals and highly efficient management.

3.3.4 T&V model

Launched in Turkey in the early 1970s and then spread to India and throughout Africa under World Bank sponsorship in the late 1970s and early 1980s, this model has proven to be financially unsustainable.

The controversial debate on the merits of T&V tends to obscure the fact that it was originally meant to solve some very specific problems of conventional extension services. Benor and Harrison's original paper—one of the most influential extension publications ever—critically evaluates the ministry-based extension system of the 1970s (Benor and Harrison 1977). They found:

- an inadequate internal organizational structure
- inefficiency of extension personnel
- inappropriateness or irrelevance of extension content
- dilution of extension impact.

Whichever impact is reached serves 'only a few favoured farmers in favoured areas rather than the bulk of the farming community'.

When first introduced, T&V seemed to be strikingly original and promising because it combined a set of rather convincing simple elements in a plausible way. Rather than trying to reach all farmers directly and thus pre-programming constant failure, the system concentrates on *contact farmers* expected to pass information on to fellow farmers with similar problems. To ensure regular field contacts, facilitate supervision and communication, and set clear and attainable objectives, *fixed visits at regular intervals* are prescribed. Similarly, regular sessions for extension workers to receive *training* and discuss administrative matters are held. Thus costly refresher courses are avoided, knowledge may be enhanced step-by-step, and up-to-date information can be fed into the system.

In addition, T&V operates under the assumption that its extension workers are exclusively engaged in educational activities and that a unified extension service exists. Agricultural research must not only be effective but also work in close collaboration with extension. Both external and internal evaluations are to be used to constantly modify and adapt the system to changing conditions.

Simple as the prescriptions seemed, implementation proved to be difficult. First, the contact farmer concept—implying a two-step flow of information from the extension worker to the contact farmer and from there to other farmers—has frequently failed. Extension workers have been blamed for 'wrong selection', but the root of the problem lies within the purely technical philosophy of T&V. Other aspects such as communication skills, leadership and organizational capacities are neglected. In practice, T&V has been a top-down approach leaving little possibility for participation and initiative, both for farmers and village extension workers. Too little emphasis has been put on critical feedback based on self-evaluation. As a result, rigidity rather than flexibility characterizes local fieldwork.

Secondly, Benor's fear that extension services may 'rapidly run out of anything to extend' (Benor and Harrison 1977, 8) characterizes many T&V field situations. The standardized messages passed on are often of little relevance to local conditions. Once T&V was extended to less favoured regions, it soon became clear that technology of the Green Revolution type showing quick and visible results is not available. Still, training sessions were held and visits made according to schedule, leaving behind disinterested farmers and demotivated extension workers.

The limited success of T&V in its present form as a nationwide extension system should not discredit the quality and appropriateness of many of its elements. Applied less rigidly and combined with the tools of human resource development as well as with the concept of participation, these elements may constitute a valuable base for reforming extension organizations, large or small (Nagel 1992).

3.3.5 NGO (international and local) model

This is a model that spread rapidly in the 1990s as many NGOs shifted gears and moved from being providers of food and humanitarian assistance to become agents of development. The NGOs established food and community development projects in many African countries in the 1990s that were primarily financed by bi-lateral donors. For example, in Mozambique in 2005, the NGOs employed 840 extensionists as compared with 770 public extension workers (Eicher 2007).

3.3.6 Private sector model

This model has been spreading in the industrial countries such as the Netherlands and New Zealand and more recently in the middle income countries such as Chile and low income countries such as Uganda. Under this model, the farmer is expected to pay some of the cost of extension with the hope that public outlays on extension could be reduced. But there is little evidence to date that small-scale farms can buy their way out of poverty by paying for extension advice. Several researchers are documenting the privatization of extension in Uganda but the jury is still out on the financial sustainability of private extension (Eicher 2007).

3.3.7 Farmer Field School (FFS) model

This started in the rice mono cropping farms in the Philippines and Indonesia in the late 1980s, as a way of diffusing knowledge-intensive Integrated Pest Management (IPM) practices for rice. FFS have since been adapted to work with other crops and diseases, and have spread rapidly across Asia, Africa, and Latin America (Nelson et al. 2001). The FFS approach represents a paradigm shift in agricultural extension: the training program uses participatory methods 'to help farmers develop their analytical skills, critical thinking, and creativity, and help them learn to make better decisions' (Kenmore 2002).

Farmer Field School is a method to train adult farmers in an informal setting within their own environment. It is often described as a 'school without walls'. FFS is a practical approach to training, which empowers farmers to be their own technical experts on major aspects of localized farming systems. FFS assumes that farmers already have a wealth of knowledge. Therefore, field schools are oriented to providing the knowledge and management skills in a participatory manner, so that the farmers' experience is integrated into the program.

The FFS method is a practical approach to training which empowers farmers to be their own technical experts on major aspects of crop and livestock production. FFS is based on the premise that the participating farmers become researchers who test the various technological options available, during which process they are able to decide what the best alternative for adoption in their particular circumstances will be. The FFS method is applicable to the production of various crop and livestock enterprises. In FFS, farmers need to be empowered to adopt potentially applicable technologies to their own particular conditions. FFS is a group extension process based on non-formal education methods, focusing on field observations, season long research studies and hands on activities. During the process, it provides a learning environment and attempts to build the capacity of the group.

You would notice that some of these models like commodity extension and T&V have been classified by other authors under approaches, while there are others who describe other 'models' of extension.

The model of extension that is being used in many developing countries today is known as ‘pluralistic’ (Davis 2004; Eicher 2004). Many stakeholders began calling for a pluralistic (multi-provider) extension model, in which the state takes on the role of facilitator for the many other actors involved in extension such as non-governmental organizations, farmers’ groups and private extension (van den Ban 2000; Gautam 2000). Because farmers are already receiving information and technology from a range of sources from other farmers to private agro-business to the public government extension system, Zijp (2002) called for the promotion of pluralistic extension approaches. The World Bank is now also promoting pluralism in extension in Kenya (Gautam 2000). This pluralistic type of system is meant to contribute to the flexibility and complementarity of extension systems, and meet the diverse needs of a wide range of farmers (Crowder 1996).

Pluralistic extension is marked by partnerships between various agencies such as the state, private companies, non-governmental organizations and farmers’ groups. These linkages are necessary to both cut costs and to involve all of the stakeholders in the extension process.

3.3.8 Innovative linkage models

Historically, extension has mainly involved technology transfer, with the village extension worker transferring knowledge from research stations to farmers by using individual, group, and mass media methods. Most recently, extension has been asked to play a ‘technology development role’ by linking research with community group needs and helping to facilitate appropriate technology development. The partners involved in the process are summarized in Figure 3.7, and the Innovative model for Technology Generation and Transfer is outlined in Figure 3.8.

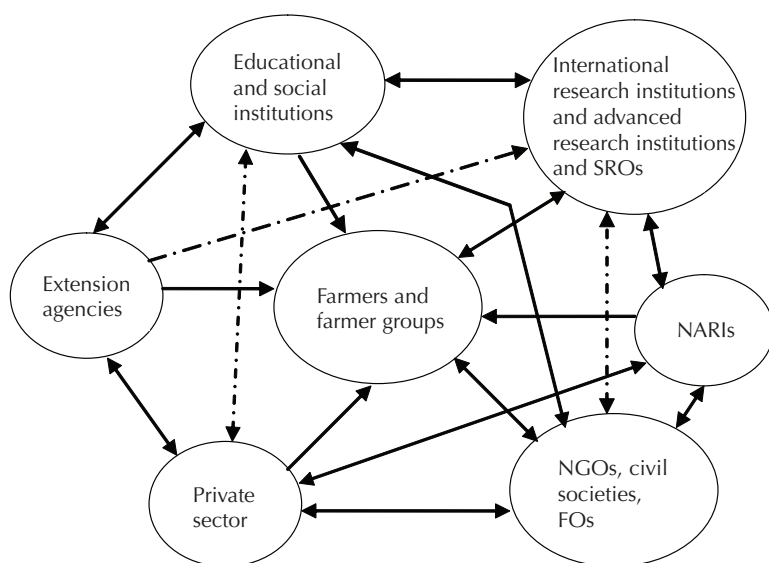
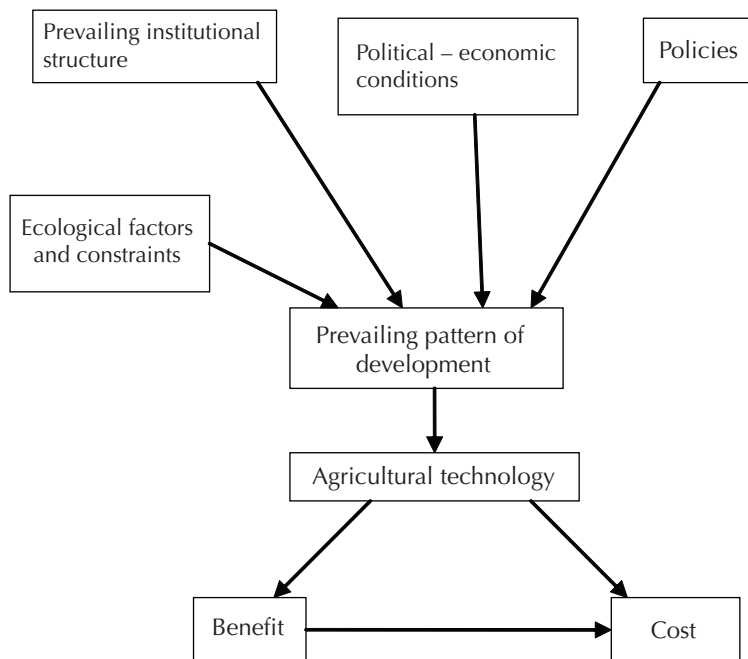


Figure 3.7. Partners involved in the Innovative Linkage Model.

In this framework, it is recognized that the prevailing institutional structure, political economic conditions, and policies underlie the development and outcome of agricultural technologies and knowledge. This framework also suggests the importance of analysing institutional arrangements, relationships between farmers and other R&D actors and policy processes that shape the development, dissemination and adoption of technology. These institutional and political-economic factors are important to address, in order to improve conditions of agricultural development, sustainability and food and nutrition security. With increasing recognition of problems from conventional approaches to agriculture, the growing

public demand for change, many individuals and organizations are working to develop alternatives, through changes in practices, technology transfer processes and policies. Many of them involved revival and strengthening of traditional knowledge systems, accompanied by selective incorporation of modern discoveries and methods from ecology. Participatory approaches are upheld and linked to wider concerns for strengthening the rural poor's capacity to manage collectively their resources more sustainable, and also to articulate their demands to the state in order to advocate and negotiate for programs that fulfill their needs. These programs also generally involve changes in institutional relations for the technology transfer process, encompassing more collaborative relations between groups and farmers, and new forms of interaction and learning.



Adapted and modified from: Lori Ann Thrupp and Miguel Altieri (2001).

Figure 3.8. *The Innovative Model for Technology Generation and Transfer.*

Some of the broad characteristics of various extension models and approaches are summarized in Table 3.1.

3.4 Extension methods

There are several methods used in extension work. Some of these include:

- individual/household extension
- group methods
- mass media.

None of these methods can be singled out as the best one: all of them have their advantages and disadvantages. The choice of methods depends on various factors such as the tenure system in the area, community organization, and resources available for extension. A combination of extension methods is more effective than just one method. For example, in an area where tenure is communal, or land management is based on communal efforts, a group approach is likely to be more effective than an individual approach. Meetings, field days and approaches to schools may also be good options.

Table 3.1. *Characteristics of various extension models*

Model	Defining characteristics	Strengths	Weaknesses	Effectiveness	Structure	Funding	Program areas	'Clientele'	Delivery methods	Linkages and diversity
Transfer of Technology	Land grant universities	Strong links with research	Unidirectional flow of information	Diffusion of technology	Cooperative: federal, state, county	Cooperative group	Agriculture, home economics, community, youth	All citizens	Research to farmers via extension agents; advisory committees	Strong links with university
Commodity Extension	Private company provides services	Motivated agents, efficient services	Limited focus	Efficient extension	Vertical	Commodity group or company	Commodity cash crop	Cash crop growers	Top-down via extension agents	Links with private research
Training and Visit	Regular training of agents and farmers	More farmer contact, higher agent training	Unsuitable technology packages, unsustainable	Professionalization	Vertical; centralized	Donors and state	Agricultural technology packages	Farmers especially 'contact farmers'	Top-down via village extension workers	Encourages links with research
Farming Systems	Systems approach, interdisciplinary teams	Reach small-scale farmers, appropriate technologies	High costs, initial non-recognition of women farmers	Developing appropriate technologies	Horizontal and vertical	Donors (USAID), state	Farming systems; holistic	Focus on small-scale producers	Recommendation domains	Emphasis on interdisciplinary approach
Farmer Participatory Approach	Centrality of farmer, participation by clientele	Capacity-building, sustainability of programs	Heavy time and effort cost, difficult to evaluate	Long-term development achieved	Horizontal; decentralized	Donors, state, farmers, NGOs	Farming systems; holistic	Emphasis on low-resource farmers and gender	Farmer to farmer, village extensionists	Emphasis on diverse linkages with various partners
Pluralistic Extension	Multiple providers, collaboration	Diversity of funding sources	Duplication of efforts, lack of coordination	Diversity	Decentralization at local level	Various	Various	Various	Various, often participatory	Many links with varying effectiveness

Usually decisions have to be made communally, and the best entry point may be through established decision-making systems, such as community meetings. Knowledge of traditional systems for making decisions is essential, particularly in pastoral areas where such systems are often still of great importance.

Even if the tenure is individual, communal management practices often exist. For example, postharvest grazing, changes in behaviour in this respect may be very desirable since uncontrolled postharvest grazing is a constraint to tree growing and soil conservation, and a change in this practice can best be achieved if the whole community is addressed. It may be difficult for an individual to introduce restrictions in this situation since the neighbours expect grazing to be free for all. In communities where group work is common, and groups have already been organized for various tasks, a group approach may also be more feasible than an individual approach.

3.4.1 The individual/household extension

This approach is most effective for activities undertaken by or within the full control of the individual farmer or household. In this regard, discussion with the whole family highlights more problems, and more experience is brought to the discussion.

Advantages of the individual method:

- Unclear messages that have not been fully understood can easily be clarified;
- The extension officer is able to secure cooperation and inspire confidence in the family through personal contact;
- It facilitates immediate feedback on the effectiveness of the measures discussed;
- It may be the best way to ensure that everyone in the family participates in decision-making.

Disadvantages of the individual method:

- It is expensive in terms of time and transport;
- Only a few farmers may be visited, and sometimes they may be mainly the extension worker's friends;
- The area covered is small since all the effort is concentrated on a few farmers.

3.4.2 Group methods

This approach involves working with groups or the community at large. It is suitable when discussing matters related to the whole community (such as postharvest grazing, protection, and management of indigenous forests) and when there are activities to be undertaken by a group (e.g. group nurseries). The advantages and disadvantages of the group approach for agricultural R&D is described in detail in Chapter 4. The direct target group may be a women's group, a church organization, a cooperative society or the community in general. Extension work can be carried out at meetings, either organized specifically for the selected purpose or by making use of meetings that were already organized for some other purpose. Meetings are effective venues for receiving information from the community, for discussing issues of communal or individual interest and for spreading new ideas. Field days and demonstration are best organized on individual farms.

Two kinds of demonstration can be used: Result and Method demonstration. Result demonstration shows farmers the results of a practice that has been in use for some time and is intended to arouse the farmers' interest in the practice. This can also be used to compare older practices or techniques with

new ones. Method demonstrations show farmers how a particular activity or task is carried out. It is among the oldest and effective methods of teaching since farmers can practice, see, hear, and discuss during the demonstration. Under the group approach five different methods are used: the catchment approach, T&V, the school approach, the mass media approach, and Farmer Field Schools.

The catchment approach

This is a special type of group approach that has been used since 1980s. All farmers within a certain area, normally some 200–400 ha, are mobilized and trained for conservation efforts. A catchment committee consisting of, and elected by, the local farmers assists the extension staff in awareness creation, layout of contours, implementation and follow up. The group approach is combined with the individual approach since each farm is subject to specific advice and layout.

The school approach

In this approach, the extension work can be in the form of lectures, support for clubs, demonstration plots or discussions held during parents' days. Schools can be approached through headmasters or teachers. The pupils can be used as a channel for reaching the community and will also be influenced themselves, thus changing the behaviour and attitudes of the new generation. Pupils can also be used to trigger discussion in their families.

Advantages of the approach:

- Schools can afford to make demonstration plots available and these be seen by many people;
- It is possible to reach large numbers of people within a short time at minimal cost;
- Pupils can be reached easily and are often very receptive to new ideas.

Disadvantages of the approach:

- Children are not decision-makers in the home;
- It will be a considerable time before the children become influential in their society.

3.4.3 Mass media

This method involves the use of the mass media (e.g. radio, posters, drama, television, newspapers, films, slide shows) to inform the public. Mass media are mainly used to create awareness.

Advantages of mass extension methods:

- These methods can increase the impact of extension staff through rapid spread of information;
- Many people can be reached within a short time, even in remote areas.

Disadvantages of mass extension methods:

- The amount of information that can be transmitted is limited;
- Radio and television reception is poor in some areas and the target group may not own sets, particularly TVs;
- It is difficult to evaluate the impact since there is no immediate feedback;
- Production of both programs and printed materials is costly and requires special skills.

Components of effective extension methods

An effective extension system has several key components:

- The most important factor is that it is participatory in nature, i.e. participation by all involved leads to more effective programs, development of suitable technologies and sustainability;
- Because funding is a limiting issue in most countries, a pluralistic system where different types of extension providers play a part is an effective extension system. This includes the ministry of agriculture or comparable government institutions, private companies, non-governmental organizations and farmers' groups. Funding would come from various sources including the government budget, donors, private companies and payment by clientele;
- An effective system has limited bureaucracy, yet is accountable to funders and clientele and provides monitoring and evaluation throughout the entire project;
- An important aspect of an effective system is that diversity is encouraged. Issues such as gender, age and ethnicity are examined and addressed.

3.5 From government owned R&E to innovation systems

According to the conventional understanding of the institutional set up for agricultural innovation in many African countries, there are basically two groups—central government agencies (for research and extension) on one side, and farmer groups on the other. This division has to do with the assumption that both research outputs and extension messages constitute public goods, which should be available to all farmers and therefore have to be delivered to them.

Following this model, the main institutional problem to be solved is to establish a linear and 'clear' pipeline, i.e. a regular flow of resources to the public agencies and from there a smooth and timely flow of results and messages on to the farmer. Institution building in this setting means to advance the linkages between the different government entities, especially the hierarchical linkage between the Ministry of Agriculture and its subordinate public services and even more importantly, the linkages between research and extension that have to build upon each other. The other big institutional issue is of course the improvement of linkages between the public organizations as providers of (research and extension) services and the farmers as recipients of these services.

An increasing number of participatory approaches and methods have been developed: the idea being, to make linkages reciprocal, so that the needs of lower levels are truly taken account by upstream elements of the pipeline. The linkage issues are still highly relevant today, wherever government and public agencies continue to be the major (if not the only) actors in agricultural technology development and dissemination.

In recent years, two trends of institutional context of research and extension can be observed. One trend is that central government agencies change their roles and are no longer the sole providers of research and extension services: this is due to public sector reforms, decentralization policies, privatization of formerly public agencies and, often enough, also due to financial crises which limit the range of activities that governments are still able to fund. The other trend is private sector enterprises become more important, i.e. private investment in cash crop technology is on the rise. The growing self-organization of farmers in producers' associations and community-based organizations as well as the increasing role of non-governmental organizations (the so-called 'Third Sector') in rural areas is frequently encouraged by development policies and international agencies.

What we see is in fact an increasing pluralism of (private and public) organizations with a potential role in rural development. Gradually (and with many differences between countries, regions and

economic sectors) the access to agricultural and technology markets grows and government hierarchies are less expected to be the dominant actors in rural development. These changes also transform the institutional setting for agricultural innovation. Under conditions of advanced institutional development, government-owned research and extension organizations are no longer supposed to be the only source of technology. There are multiple sources of innovation and often several (public, semi-public or private) providers of research, information and advisory services and therefore a wealth of possibilities of innovations that can be initiated.

In agriculture, it is hard to find situations where farm innovations are brought about by private industry and market mechanisms alone. Normally, public entities (e.g. research institutes, universities, schools), as well as private enterprises and third sector organizations (agricultural chambers, farmers organizations etc.) all can play a role in the innovation process and frequently have to work together to identify and introduce a new farming technique. Who among the parties will take the lead, is likely to differ from case to case and depends on their interest and resources.

A collaborative arrangement bringing together several (private and public) organizations working for technical change in agriculture can be called an 'innovation system'. Innovation systems are networks which organize around a common issue (e.g. an agricultural product, a pest or a resource problem). Within the network, innovations can be promoted by different participants, not only by research institutes or extension services. Often innovation systems are characterized by public and private entities cooperating to solve problems and thus form an 'intermediate area' of social organization, i.e. one that is between government hierarchy and markets. The coordination between the participants is less achieved through administrative control from the top but through self-organized exchange between the actors and through market-like forms of regulation.

The network model of innovation can be traced to such concepts as 'farmer innovation' (Chambers 1983; Richards 1989), 'AKIS' (Roling 1990; Engel 1995) or the 'multiple sources of innovation model' (Biggs 1989). The innovation systems idea does not provide one generic institutional model for innovation. There is no uniform theory of innovation. Instead of postulating a defined role for the different government bodies, where the ministries of agriculture fund research and extension, research institutes develop technologies and extension services spread them, it becomes necessary to assess the actual conditions of each case and look who among several partners may take over one of these function. In this perspective, the different functions (from funding to research to technology dissemination) are still performed but who performs them and how is not predetermined. Therefore, the concept of innovation systems is empirical: we have to observe who is interested in a particular innovation, who participates in developing it and which rules and regulatory mechanisms are operating.

References

- AGRITEX (Department of Agricultural, Technical and Extension Services). 1998. *Learning together through participatory extension: A guide to an approach developed in Zimbabwe*. AGRITEX, Harare, Zimbabwe.
- Axinn GH. 1988. *Guide on alternative extension approaches*. FAO (Food and Agriculture Organization of the United Nations), Rome, Italy.
- van den Ban AW. 2000. *Different ways of financing agricultural extension*. ODI, AgREN Network Paper 106b. London, UK.
- Bastidas EP. 2001. Assessing potential response to changes in the livelihood system of diverse, limited-resource farm households in Carchi, Ecuador: Modeling livelihood strategies using participatory methods and linear programming. PhD dissertation. Food and Resource Economics Department, University of Florida, Florida, USA.

- Bennet C. 1990. *Cooperative extension roles and relationships for a new era: Summary*. Extension Service, US Department of Agriculture, Washington, DC, USA.
- Benor D and Harrison J. 1977. *Agricultural extension: The training and visit system*. World Bank, Washington, DC, USA.
- Biggs SD. 1989. *A multiple source of innovation model of agricultural research and technology promotion*. Agricultural Administration (Research and Extension) Network Paper. ODI (Overseas Development Institute), London, UK.
- Birkhaeuser D, Evenson RE and Feder G. 1991. The economic impact of agricultural extension: A review. *Economic Development and Cultural Change* 39(3):607–650.
- BMZ (Bundesministerium für Wirtschaftliche Zusammenarbeit). 1990. Querschnittsanalyse von Projekten der Ländlichen Regionalentwicklung. BMZ, Bonn, Germany.
- Bunch R. 1985. *Two ears of corn. A guide to people centred agricultural improvement*. World Neighbours, Okalhoma, USA.
- Cernea MM. 1985. *Putting people first: Sociological variables in rural development*. Oxford University Press, New York, USA.
- Chambers R. 1974. *Managing rural development*. Scandinavian Institute of African Studies, Uppsala, Sweden.
- Chambers R. 1983. *Rural development: Putting the last first*. Longman, London, UK.
- Chambers R. 1993. *Challenging the professions. Frontiers for Rural Development*. IT publications, London, UK.
- Chambers R and Ghildyal BP. 1985. Agricultural research for resource poor farmers: The farmer first and last model. *Agricultural Administration* 20(1):1–30.
- Collinson M. (ed). 2000. *A history of farming systems research*. CABI (Commonwealth Agricultural Bureau International) Publishing, London, UK.
- van Crowder L. 1996. *Decentralised extension: Effects and opportunities*. FAO Sustainable Development. FAO (Food and Agriculture Organization of the United Nations), Rome, Italy. Available at <http://www.fao.org/sd/EXdirect/EXan0013.htm>
- Davis K. 2004. Technology dissemination among small-scale farmers in Meru central district of Kenya: Impact of group participation. University of Florida, USA.
- Dunn T, Humphreys L, Muirhead W, Plunkett M, Croker N and Nickl M. 1996. Changing paradigms for farmer–researcher–extensionist relationships: Exploring methods and theories of farmer participation in research. *European Journal of Agricultural Education and Extension* 3(3):167–181.
- Eicher CK. 2004. *Rebuilding Africa's scientific capacity in food and agriculture*. Staff Paper No. 2004–12. East Lansing, Michigan, USA; University of Michigan Department of Agricultural Economics, USA.
- Eicher CK. 2007. Agricultural extension in Africa and Asia. Literature review prepared for the World AgInfo Project. Cornell University, Ithaca, New York, USA.
- Engel P. 1995. Facilitating innovation. An action-oriented and participatory methodology to improve innovative social practice in agriculture. PhD dissertation. Wageningen University, Wageningen, the Netherlands.
- Escobar A. 2000. Beyond the search for a paradigm? Post-development and beyond. *Development* 43(4):11–14.
- Farrington J and Martin A. 1988. Farmer participation in agricultural research: A review of concepts and practices. Occasional Paper 11. ODI (Overseas Development Institute), London, UK.
- Feder G, Willett A and Zijp W. 2001. Agricultural extension: Generic challenges and the ingredients for solution. In: Wolf S and Zilberman D (eds), *Knowledge generation and technical change: Institutional innovation in agriculture*. Kluwer, Boston, Massachusetts, USA.
- Gautam M. 2000. *Agricultural extension: The Kenya experience: An impact evaluation*. World Bank, Operations Evaluation Department, Washington, DC, USA.
- Gemo H, Eicher CK and Teclerariam S. 2005. *Mozambique's experience in building a national extension system*. Michigan State University Press, East Lansing, USA.
- Harwood R. 2000. *A history of farming systems research*. FAO (Food and Agricultural Organization of the United Nations), Rome, Italy, and CABI (Commonwealth Agricultural Bureau International) Publishing, London, UK.
- Haverkort B, van der Kamp and Waters-Bayer A. (eds). 1991. *Joining farmers' experiments: Experiences in participatory development*. IT Publications, London, UK.
- Hildebrand PE. 2001. A personal history in FSR. In: Collinson M (ed), *A history of farming systems research*. CABI (Commonwealth Agricultural Bureau International) Publishing, London, UK.
- IBRD (International Bank for Reconstruction and Development). 1987. *World Bank experience with rural development, 1965–1986*. The World Bank, Washington, DC, USA.

- Kenmore P. 2002. Integrated Pest Management. *International Journal of Occupational & Environmental Health* 8(3):173–174.
- Moris J. 1991. *Extension alternatives in tropical Africa*. ODI (Overseas Development Institute), London, UK.
- Nagel UJ. 1980. *Institutionalization of knowledge flows: An analysis of the extension role of two agricultural universities in India*. DLG-Verlag, Frankfurt (Main), Germany.
- Nagel UJ. (ed). 1992. *Developing a participatory extension approach: A design for Siavonga District, Zambia*. Centre for Advanced Training in Agricultural Development, Technical University of Berlin, Berlin, Germany.
- Nelson R, Orrego R, Ortiz O, Tenorio J, Mundt C, Fredrix M and Vien NV. 2001. Working with resource-poor farmers to manage plant diseases. *Plant Disease* 85(7):684–695.
- Norman D. 2000. FSR: A personal evolution. In: Collinson M (ed), *A history of farming systems research*. CABI (Commonwealth Agricultural Bureau International) Publishing, London, UK.
- Norman D. 2002. The farming systems approach: A historical perspective. In: Proceedings of the seventeenth international Farming Systems Association Symposium, Orlando, USA.
- OECD (Organisation for Economic Co-operation and Development). 1994. *DAC orientations on participatory development and good governance*. OECD Working Papers. OECD, Paris, France.
- Paul S. 1987. *Community participation in development projects: the World Bank. Experience*. World Bank Discussion Paper No. 6. The World Bank, Washington, DC, USA.
- Pearse A and Stifel M. 1979. *Inquiry into participation. Research approach*. UNRISD, Geneva
- Picciotto R and Anderson J. 1997. Reconsidering agricultural extension. *The World Bank Research Observer* 12(2).
- Purcell DL and Anderson JR. 1997. *Agricultural research and extension: Achievements and problems in national systems*. World Bank Operations Evaluation Study, World Bank, Washington, DC, USA.
- Put M. 1998. Innocent farmers? A comparative evaluation into a government and an NGO project located in semi-arid Andhra Pradesh, India, meant to induce farmers to adopt innovations for dryland agriculture. Thela Publishers, Amsterdam, Netherlands.
- Rauch T. 1993. *Regional rural development RRD update: Elements of a strategy for implementing the RRD concept in a changed operational context*. Deutsche Gesellschaft für Technische Zusammenarbeit (GTZ), Eschborn, Germany.
- Rhoades RE and Booth RH. 1982. *Farmer-back-to-farmer: A model for generating acceptable agricultural technology*. Social Science Department, International Potato Center, Lima, Peru.
- Richards P. 1985. *Indigenous agricultural revolution: Ecology and food production in West Africa*. Hutchinson, London, UK.
- Richards P. 1989. Agriculture as a performance. In: Chambers R, Arnold P and Thrupp LA (eds), *Farmer first: Farmer innovation and agricultural research*. Intermediate Technology Publications, London, UK.
- Rivera WM, Qamar MK and van Crowder L. 2001. *Agricultural and rural extension worldwide: Options for institutional reform in the developing countries*. FAO (Food and Agriculture Organization of the United Nations), Rome, Italy.
- Rogers E. 1995. *Diffusion of innovations*. Free Press.
- Roling N. 1990. The agricultural research-technology transfer interface: A knowledge systems perspective. In: Kaimowitz D (ed), *Making the link—Agricultural research and technology transfer in developing countries*. Westview Press, Boulder, Colorado, USA.
- Schulz M. 1973. *Landwirtschaftliche Neuerungsverbreitung an der Elfenbeinküste*. Verlag der SSIP-Schriften, Saarbrücken.
- Swanson B, Bentz R and Sofranko A. 1997. *Improving agricultural extension: A reference manual*. FAO (Food and Agriculture Organization of the United Nations), Rome, Italy.
- Thrupp LA and Altieri M. 2001. Innovative models of technology generation and transfer: Lessons learned from the south. In: Wolf SA and Zilberman D (eds), *Knowledge generation and technical change: Institutional innovation in agriculture*. Natural Resource Management and Policy. Kluwer Academic Publisher, Belgium.
- World Bank. 1994. Agricultural reform implementation support (ARIS) project, Russian Federation. Staff Appraisal report, Agriculture, Industry and Finance Division, Europe and Central Asia Region. World Bank, Washington, DC, USA.
- Zijp W. 2002. Promoting pluralism: The need for transition. Unpublished presentation, the World Bank, Washington, DC, USA. Retrieved from <http://wbIn0018.worldbank.org/ESSD/susint.nsf/a816cbacda716c9d85256ab40002d5cd/2fc4edaabc319ca9852569d800780b8d?OpenDocument>.

4 Group formation and management for participatory research and extension

4.1 Introduction

4.2 Farmer groups

4.3 Farmer groups in extension

4.4 Groups and their dynamics

4.5 Group formation and development

4.6 Planning and implementation of group activities

4.7 Group performance

4.8 Monitoring and evaluating the role of FGs

4.1 Introduction

Social capital in the form of groups is used in communities worldwide, especially in rural areas, as safety nets to cope with risks and for mutual assistance. Traditionally, communities formed groups according to extended family, kinship, funeral associations and resource-sharing (e.g. oxen) relationships. These groupings were not formalized but high levels of trust and mutual cooperation characterized them. Rural communities interact within and across social levels and hierarchies but in general, people are grouped according to gender, wealth and age.

Group approaches have been recommended for research and extension for a variety of reasons as discussed in Chapter 3 of this source book. This chapter focuses on the importance of farmer groups for research and extension and the experiences hitherto. It also outlines the general definition and characteristics of groups with a focus on farmer groups, looks at reasons why groups form and gives a brief overview of group dynamic issues. The common types of existing farmer groups are identified. The relevant issues are treated from both the developmental agents and community members' points of view.

4.2 Farmer groups¹

Farmers have been working in groups ever since farming started, varying from cooperation in harvesting and threshing, joint storage of produce and collaborative grazing and management of animals. Groups are valuable as a form of collective action to farmers, providing resources such as credit, labour and information. Groups allow farmers to obtain new technologies, benefit from economies of scale, enter into stable relationships with suppliers, and set rules for natural resource management (Stringfellow et al. 1997; Place et al. 2002). Under the influence of outside forces such as markets, input supply and knowledge and information development, farmers have organized themselves in less informal groups,

1. This section and chapter heavily draw on Heemskerk and Wennink (2004).

either as specific farmer groups (FGs) or as community groups with a wider agenda. FGs emerged for a variety of reasons and with different socioeconomic or political backgrounds and objectives. Groups can have different functions ranging from a production focus (management of resources, marketing) to consumption orientation (inputs, credit, household goods). Experience has shown that the most effective groups are those initiated by community members themselves and built upon local concepts of social organization.

Ever since the general adoption of the Farming Systems Approach (FSA) in agricultural service delivery in sub-Saharan Africa (SSA), research and extension have been working with different types of informal and formal FGs. Working with groups is a more decentralized process and less top-down than working with individuals (Sanginga et al. 2001). A group or collective action approach has proved to be an effective way of enhancing empowerment of farmers in the innovation system. Experience has shown that working with FGs is important to ensure greater inclusiveness of the rural poor in innovation development and, that the involvement of FGs (and more formal associations and organizations) and their capacity to provide effective representation and services especially for small farmers is a key factor in achieving more rapid and sound rural development (IFAD/IFAP 1987; Rivera et al. 2000; World Bank 2000). Donors are seeing the value of farmer groups, such that they are sometimes a prerequisite for various agricultural projects (Stringfellow et al. 1997).

The building of social capital at the community level proved to be crucial to technological innovation for the development of more productive, profitable and sustainable farming systems. Social capital requires enhancement in all its three dimensions namely: 'bonding' (within groups); 'bridging' (between groups); and, 'linking' (with agricultural service providers or 'ASPs').

Groups enhance dialogue, facilitate the organization of field days, promote efficient use of resources, improve farmers' collective confidence, ensure that their needs are taken into account, and the reaching of consensus positions. FGs provide opportunity to share ideas and labour and the exchange of information and thus create a multiplier effect, which facilitates the spread of relevant technologies (Mavedzenge et al. 1999).

A group approach fulfils a number of conditions, which are essential in fostering genuine partnerships. An FG approach generally has the following structure and characteristics (IFAD/IFAP 1987):

- An organizational structure with links both horizontally (between groups) and vertically (with higher level farmer organizations), respecting customs and traditions and based on the voluntary right of association;
- Representing farmers and providing services to members;
- An organization that has its own funds and adequate, competent staff (at higher levels).

Important FG functions are: interfacing between users and ASPs, representing the user constituency, and pro-active roles in the generation and extension of agricultural technologies (Bebbington and Riddell 1994). Technology development and dissemination has been found to improve through farmer research groups (FRGs) and groups contributed to greater diffusion of information (Andima et al. 2002). Working with FRGs is necessary in order to overcome reluctance to share information.

Collective action through FGs may be aimed at different purposes and functions (generating, spreading, sharing, using and applying knowledge and information) and different types of groups have developed in farmer-led research and extension:

- Farmer or producer organizations are membership-based; they manage relations with other organizations that are active in the rural and agricultural sectors and can take the form of multi-tiered organizations (micro, meso and macro);
- Farmer Groups (FGs) are more informal (without formal membership) and operating mainly at the community level. FGs can either be based on existing groups or specifically set up;
- Farmer Research Groups (FRGs) work with public (or private) research;
- Farmer Extension Groups (FEGs) are part of the public (or sometimes private) agricultural extension systems;
- Farmer Field Schools (FFS) focus on joint learning with agricultural research, extension and/or education organizations;
- Groups that focus on innovation based on farmers' indigenous knowledge have been referred to as farmer innovation groups (Reij and Waters-Bayer 2001).

4.2.1 Research and development groups

Given our focus on agricultural development through farmer groups, we focus on FGs for research and development. The commonly found groups within the R&D arena of the smallholder producer are:

- research groups
- extension groups
- research and extension groups
- service acquisition groups (credit, marketing, seed) and
- production groups.

Although the input acquisition groups including savings and credit, germplasm multiplication and distribution are becoming important as a result to the prevalent economic changes, most of the well established groups focus on either research or extension and in some cases on both research and extension. These three types of groups are discussed here.

4.2.2 Farmer Research Groups (FRGs)

An FRG is a group of farmers who together identify topics for research, conduct field tests, experimentation and evaluation together with specialists from research and extension institutions. The cornerstones of FRGs are participation, communication and group composition. The formation of groups varies from country to country.

The advantages of FRGs are:

- Stimulates discussion, highlights areas of conflict requiring more details;
- Creates interest in, and commitment to collaborative research;
- Useful for diagnostic or exploratory work;
- Facilitates refinement of secondary data (Indigenous Technical Knowledge, regional history);
- Facilitates execution of farmer-managed trials;
- Immediate evaluation on technology and feedback is obtained to station based researchers;
- Increases possibility of involving a wider spectrum of population through representation and discussion;
- Groups can also form collateral for credit;
- Greater farmer participation. Increases farmer input in technology design and testing, thus increases adoption rate of new technologies;

- Cost effective method for conducting research. FRG approach greatly expands the number of technologies being tested as well as the number of replications. It increases the amount of research done per unit of researcher time, scientific validity and the relevance of that research (Heinrich 1993);
- Greater out-reach of research efforts—farmer-to-farmer extension;
- Help the farmers in bringing out more and stronger argument, which alters the dynamics of the relationship between the farmer and the researcher;
- Increases interaction among farmers leading to wider access to knowledge;
- When groups are exclusively technology focused, they tend to be small and political (Heinrich 1993).

Despite these advantages Heinrich (1993) identified the following potential problems, which if not addressed could render the work of FRG useless.

- Groups can be dominated or inhibited by the presence of certain people (often wealthier farmers) producing a false consensus or biased comments;
- Members will often withhold opinion on sensitive subjects at a group meeting;
- Group activities may not be culturally acceptable;
- Groups are sometimes less reliable for quantifying farmer opinions because group members influence each other;
- Identifying farming groups that represent user population and/or fit research purposes may be logistically difficult or time consuming when respondents are geographically dispersed.

Researchers basically work with two types of FGs: the first group can be termed functional in nature and is formed at the instigation of researchers (i.e. 'research induced'); and those, in which research related activities are superimposed on preformed farmer groups originally set up for other purposes (i.e. usually for improving access to inputs and/or marketing of products in 'producer based groups').

In comparing the farmer research groups that are 'research-induced' and 'producer-based', the following observations were made.

- Advantages of producer-based groups are that access to developmental stakeholders is already established to some extent. This is an important consideration since adoption of improved technologies and practices often require support of some sort on the part of the developmental stakeholders. In contrast, there is no automatic guarantee that research-induced FRGs have such linkages. In such situations it may not be possible for farmers to adopt some promising technologies because of deficiencies in the linkages to the development practitioners. Tanzania effectively handled this problem by locating research included FRGs in villages where other developmental stakeholders are operating.
- There were some concerns that working with producer-based FRGs may have some disadvantages. Four specific disadvantages were identified:
 - They may not be representative of all types of farmers in the research mandate area;
 - They may not be strategically located in all the locations that need on-farm research;
 - It may not always be easy to superimpose a research function on a pre-formed group whose initial function for formation was different; and
 - The specific commodity interests of some producer-based groups may preclude farmers from being interested in collaborating in research on other parts of the farming system they are operating.

- Research induced FRGs potentially permit not only greater flexibility in terms of where researchers work, but also permits them to have a say in their composition and allows changes in their composition over time.
- Due to their informal nature and focus on 'ideas' rather than 'products', the chances of research induced FRGs remaining intact over a long period are not very high. Recognizing this problem in some cases as in Tanzania has led the research induced FRGs to evolve into more formalized empowered type groups in order to pursue similar types of functions as producer based groups.

Thus it is very clear that both research and producer based FRGs have potentially useful roles to play in facilitating meaningful interaction between researchers and farmers but neither is perfect. As a result specific strategies need to be employed to ensure that the possible detrimental characteristics of each type are minimized.

4.2.3 Farmer Extension Groups (FEGs)

Cost considerations in transferring technologies lead to the formation of farmer extension groups. Many of the benefits listed for FRGs will also apply for FEGs. This approach is also thought to enhance farmer-to-farmer extension technologies. The training and visit (T&V) extension approach has recently in many countries changed from one of using groups as a forum for transmitting messages to one in which group members decide what they wish to have help with and hence are becoming somewhat farmer driven. The emerging Farmer Field School Approach to technology development and dissemination also uses the group approach. Thus the groups approach to extension is on the increase. The FEGs are discussed in detail in the following section.

4.2.4 Farmer Research and Extension Groups (FREG)

These are groups formed in order to fine-tune technologies as well as to promote the adoption of such technologies. They exhibit the combined characteristics of both farmer research and farmer extension groups. In one of the projects in Lare Division in Kenya, the following were given as the benefits of employing FREG as the vehicle for technology transfer and dissemination.

- It provides an opportunity for the concerned community (FREG members) to identify their technology requirements in a participatory way;
- It makes available relevant technology to all the members of the FREG without restricting access and is therefore considered group neutral;
- Since the major objective of the FREG system is to access technology, it develops a binding factor that sustains the membership;
- The FREG system enhances farmer-to-farmer information exchange thereby ensuring sustainability beyond the project area;
- The FREG system provides for organized farming communities and therefore lays the foundation for demand driven research/extension services that can form the basis for privatization of such services;
- The FREG system improves the capacity of extension staff through training sessions on new technology.

It is important to note that the group approach to TOT is being increasingly used. Gradually the informal farmer groups are becoming formal and also the scope and activities of these groups are also expanding. In many countries, farmer groups are managing local dip tanks, rural retailing of inputs, rural fencing, saving schemes, as well as germplasm multiplication and distribution.

At present, countries are moving away from forming specific groups for specific functions. The farmer groups approach is used to achieve multiple objectives and is becoming a common feature in all farm level intervention, i.e. it is the basic unit for rural development.

4.3 Farmer groups in extension

One of the most promising means of scaling up technologies in the new pluralistic extension environment is through social capital in the form of community-based extension mechanisms.

Groups are considered by both governments and donors to be vehicles and entry points for new technologies and training for farmers. Extension workers find that their work is easier to handle when they deal with groups. Groups can be a powerful tool for extension, especially because they present an efficient way for extension staff to pass on information and technologies. In relation to agricultural extension, different group concepts have developed. In the T&V system, 'contact groups' are groups of farmers providing a platform for interaction with public extension staff. In case farmers play a more active extension service function (farmer-to-farmer extension), groups are referred to as FEGs; they play an important role in the dissemination of technology. FEG members assess acceptability of technologies across a representative choice of farmers. Consequently, the FEG should be composed of various farmer categories; the number of its members can be larger than of an FRG because of the less intensive monitoring required.

FEGs provide a tool to improve the cost efficiency of collaboration of researchers, farmers and extension workers as a result of logistical reasons (e.g. joint meetings, joint evaluations). In the context of privatization and liberalization trends in agriculture, farmers are forced to work together in order to cope with these developments and jointly procure resources such as means of production, inputs and knowledge. The emphasis on decentralization and downward accountability in many SSA countries gives more opportunities for farmer and village groups to exert influence over district development plans and public research and extension priority setting, as long as FGs are capacitated to address this more empowered role.

4.3.1 Role of farmer groups in extension

FGs in agricultural innovation (FRG and FEG group functions) has primarily been in participatory technology development, participatory learning and action research, and technology adaptation/dissemination. In addition to these tasks, FGs can have other functions in relation to the innovation system.

- Communication and information function. FRGs are popular hosts of external visits and representatives may participate in farmer radio programs (Tanzania, Zambia). FRGs contribute to the development of extension material. FRGs legitimize the concept of farmer-to-farmer trial visits and researcher-farmer trial visits at least in a normative sense (Drinkwater 1994).
- Dissemination functions. Apart from the organization of field days as part of the contribution to the technology development cycle, FRGs play an active role in linking up with FEGs and can have a leading role in farmer-to-farmer extension. FRGs are often involved in seed and vegetative planting material multiplication and contribute in this way to the dissemination of technology.
- Networking functions. FRGs can link up with other FRGs, as well as with FECS and other community groups and form horizontal networks, which can exercise a stronger lobby function. The networks can develop into local farmer unions, which federate at a higher (national) level.

- Other activities that are not directly related to the innovation system. Many FRGs will have other functions; notably existing groups, but also new groups may develop additional functions. These are often along the lines of marketing and input supply including credit and savings associations.

Farmer groups have played an important role both in the community and in extension, and now appear to be taking on an even larger role. It is known that farmers transfer knowledge and technologies to each other (Arbab and Prager 1991; Maseko et al. 1991; Gubbels 1997). Maize was spread throughout the African continent long before any formal extension was in place. Rhoades and Booth (1982) argued that farmers are beneficial sources of information and practices for other farmers. In Kenya, the major source of agroforestry germplasm was other farmers, according to a study in 1998 (Edouard 1998). Farmers obtained germplasm from their own farms, relatives and neighbours. Over 39% of the farmers interviewed exchanged agroforestry germplasm with other farmers (Edouard 1998).

The current Kenyan extension program, National Agriculture and Livestock Extension Programme (NALEP), encourages what are called 'common interest groups'. Within a group context, one resource person can be trained, who will then be empowered to pass on the information to the group. Groups are believed to extend technologies faster than individual farmers. They have also been found to support fellow members in adoption (Phiri et al. 2004). In one study, 78% of the project beneficiaries were said to be non-members of the farmer groups (Mutia 1999).² They were benefiting because of dissemination of information and technologies by the dairy goat groups, especially at the buck stations.

Working with FGs in eastern Africa showed that this approach strengthens the involvement of farmers by:

- Creating an opportunity for a continuing dialogue between farmers, researchers and extension staff;
- Encouraging increased farmer-to-farmer interaction in technology development and dissemination.

This is particularly essential in conducting research on and implementing technologies/management practices that go beyond the individual farm level. For example, research on and management of common pool resources such as forests and natural grasslands requires an FG approach in addition to a multi-stakeholder approach and needs strong partnerships to solve and implement such complex issues involving farmer communities as well as other stakeholders. FGs are also needed to enhance efficiency, as research products are scarce public goods. Real partnerships cannot be developed when large inequalities exist between partners in decision-making capacity and power. Therefore, although rarely an explicit objective, FGs are also an important means to foster partnerships and a group approach to:

- Improve farmers' capacity to analyse their problems and needs, thereby increasing their self-awareness and subsequently their ability to influence research and extension agendas through more intensive exchange of information between community members;
- Facilitate farmer empowerment, thereby increasing their influence on other stakeholders (KIT 1997).

Farmers have some comparative advantages over what are seen as the more conventional extension agents. Because they have similar circumstances, usually speak the same mother tongue and have comparable educational backgrounds, farmers can communicate well with and are trusted by fellow farmers. Farmer extensionists are able to reach more people in a more timely fashion than regular agents (Nyakuni 2001). Farmers can be trained to lead community-based extension, or farmer exchanges can

2. FARM Africa, Meru Tharaka Nithi Dairy Goat and Animal Healthcare Project Progress Report, January to June 1999.

be facilitated in order to share information. Farmer trainers are already being educated in areas where the World Agroforestry Centre is working, since they can effectively pass technologies on to fellow farmers (Cooper and Denning 1999). Farmer groups can be facilitated to network with other groups, forming strong farmers' associations and giving farmers a voice with which to educate other farmers and to demand services.

Along with advantages, farmers or community-based mechanisms of any kind have some obvious disadvantages as extension players. They do not have the power or authority to institute or regulate policy as governments do. They may lack capacity, resources and the infrastructure that government or private organizations have. According to Scarborough et al. (1997) the following needs have to be addressed in farmer-led extension: the best way to choose farmer extensionists, defining their role, remuneration for farmer-extensionists, and personal issues and jealousies that may play a role at the community level.

Due to the reasons discussed above, many are advocating community-based extension through farmer groups as a means of scaling up technologies (Nyakuni 2001; Raussen et al. 2001; Wambugu and Kiome 2001). However, little is known about how farmer groups work in disseminating technologies and information. There is limited empirical evidence on the performance of groups (Pretty and Ward 2001). This points to a need to examine farmer-to-farmer technology dissemination using farmer groups. The following section highlights some of the research findings on the role of farmer groups in disseminating technology. Factors that play a role in farmer group success are also described.

Lessons learned in farmer groups

Many studies on farmer groups attempt to find out why farmers join groups—what benefits do they gain from being in a group? In an analysis of farmer groups in cereal growing systems in the UK, Wibberley (1997) rated farmers' perceptions of farmer group benefits in the categories of self-help, motivation, cohesion and performance. Some of the highest ratings were with regard to cohesion; giving friendship, problem sharing and enjoyment received the highest marks. In Kenya, Alawy and McCaslin (1998) found that women feel that they benefit from being in the group through training, cash, financial assistance, knowledge gained and food.

Farmer groups have proven to be a useful way to access a community and to extend knowledge to other farmers. In Australia, Andreatta (2000) found in her study of farmer groups that they were an efficient way for farmers to share information and experience. Rouse (1996) found that being part of a group contributed to knowledge, empowerment, confidence and ability to make decisions among members. Women's groups were shown in Malawi to reach more smallholders than customary extension practices, and to be an efficient way to reach women farmers (Sigman 1995). They are an important component of farmer-to-farmer extension, helping to coordinate research and extension. A study by Parkins in 1997 showed that 63% of farmers surveyed in Embu preferred to approach groups, rather than individual farmers, for information on tree planting.

Both public and private development partners can facilitate such groups to achieve their goals by linking them with other groups and service providers (Cooper and Denning 1999). Geran (1996) in her study in Zimbabwe found that group formation led to increased links with service providers, as did Rouse (1996) in Zambia. Such groups increase the efficiency, effectiveness and equity of service provision and also help to empower farmers (Esman and Uphoff 1984; Geran 1996). However, being in

a group does not guarantee equal access to services. There may be differences among groups that lead to inequitable service provision. Alawy and McCaslin (1998) conducted a study on the Kenyan coast where they examined factors influencing accessibility of women's groups to extension services. They found that extension tended to be biased toward male farmers, Christians and tribes from other areas. This was likely due to the fact that extension workers are mostly male, Christians working in a Moslem area, and from an 'up-country' tribe.

Esman and Uphoff (1984) perhaps conducted the most comprehensive study on groups. They analysed a cross-section of local organizations (LOs) from around the world. Data were gathered from various books, journals and bibliographies on the subject of local organization. From this large set of case studies, data was gathered and analysed. The authors put forth the idea that LOs act as intermediaries in rural development; they intermediate between individuals and the state. Rather than being a part of the public or the private sector, LOs rather make up a third sector. According to Esman and Uphoff (1984), they can extend the outreach of public services, increasing their efficiency. They can also aggregate the demands of rural people and assist them to solve problems in appropriate ways.

This 1984 study was based on an earlier study conducted in 1974. The 1974 study indicated that local organizations were necessary for rural development. It also showed that the most efficient local organizations functioned at more than one level. Those organizations with links to political or administrative centres that provide information were also more effective. Esman and Uphoff (1984) believed that characteristics of the poorer members of the community prevented them from taking part in local organizations.

This is in contrast to Parkins' findings. Parkins (1997) conducted a study on the mechanisms of group extension of agroforestry technologies in central Kenya. He termed this 'innovation networking' and found that networking varies by gender, attitude toward participation and recency of migration. He found that formal organizations tended to provide information to farmers, while informal organizations usually provided materials. Parkins expected to find that group participants were the middle class of small-scale farmers, because the poorer farmers might not be able to afford the financial and labour commitments. However, he found that the poorer farmers actually were participating in groups along with those of a more average wealth level. The wealthier farmers were not as heavily involved in groups.

Another hypothesis in Parkins' study was that group-to-farmer contacts would be more common than farmer-to-farmer contacts. Because 63% of farmers preferred groups to individuals for information, this hypothesis was retained. However, respondents also perceived that there were local experts available, and about half of them approached their neighbours for networking purposes.

Given this background, the following sections provide some general principles and guidelines for understanding group dynamics, and their formation and management.

4.4 Groups and their dynamics

4.4.1 The importance of the group

A group may be seen as two or more persons with common problems, needs and interests, residing in one locality, who interact with one another for the common goal (Show 1976). A group normally has a definite membership, which may vary depending on the objective/purpose, task and personalities of

members. Group members interact and influence each other as they become mutually dependent in solving their common problems. The crucial factor is that, as in the case of a member of the family, each member shoulders some responsibility and perceives some direct or indirect benefit to him/herself. In a group, individual's strengths are exploited and weaknesses are minimized.

Groups are important vehicles of rural and individual development. Groups play an important role in developing both the communities and individuals.

4.4.2 Groups as building blocks for development

Groups are increasingly being acknowledged as essential building blocks for rural development because of the following advantages:

- They offer the rural poor an opportunity to collectively develop their skills, mobilize resources and influence the nature and direction of development activities in order to improve production, incomes and hence their livelihood;
- Working with groups offers development agencies an opportunity to efficiently and effectively, utilize limited resources to reach a larger audience as compared to working with individuals;
- Groups are also seen as a basis for economic 'take-off' as they have the potential to mobilize resources that will enhance the prospects of rural people's participation in development;
- Groups can act as collateral substitute for members to access credit. In addition, groups have the potential to increase the sustainability and outreach of the credit program. Further, groups have the advantage of reducing the transaction costs and improving credit management among members;
- Groups enhance the bargaining power of the rural poor.

The groups should be self reliant, sustainable and linked to each other and to service providers. Their empowerment is therefore critical to the success of development efforts. Development agents should therefore consider the initial development of the group as an equally vital extension activity. In real life, there are more groups that fail than succeed. This puts a damper on the potential of groups as a vehicle for development.

The understanding of what groups are and their characteristics is a critical factor to the issue of group dynamics. Group dynamics is the study of the nature of groups of people, their patterns of development and their relation as individuals and with other groups. Group dynamics investigates how power and authority structures emerge, how communication systems and intra-group conflicts are handled. Dynamic interactions and relationships within a group create change and redefine the roles of its members.

Group dynamics is to understand how groups form, grow and perform tasks. This will enable development agents to facilitate the process, while group members will also appreciate the role of facilitation in group development. In this light, development agents need to understand the following:

- Why groups form?
- Why individuals join groups?
- What causes group failure or success?
- The stages in the development of groups;
- The culture of groups;
- How the community and groups relate.

4.4.3 Groups as individual enhancement

Groups form to satisfy both individual and group needs. Individuals may not be able to perform certain tasks alone due to a number of factors such as lack of resources, knowledge and skills. Box 4.1 lists the reasons why people join groups.

Box 4.1. Why people join groups

Individuals may join groups for various reasons including the following:

- Group offers activities in which member cannot engage except as part of a group.
- Building up resource base through income generation.
- Bargaining and lobbying power.
- Sharing labour in performing productive tasks.
- New experiences and challenges.
- To learn from each other (sharing experiences).
- Accessing resources—both capital and human.
- As an opportunity for recognition and acceptance.
- Preservation of self-integrity.
- Sense of belonging and security.
- To influence others and take lead.
- For assumption of roles and expression of abilities and skills.
- Solution to an individual problem.
- Parents belonged to the group and so children are expected to join.
- Increase unity among members on specific issues.
- Pooling marketable products and increasing chances of market access.

Source: Ministry of Agriculture, Kenya, ULAMP and SCAPA.

By forming groups, farmers are able to:

- combine knowledge, skills and resources
- gain enhanced access to services and inputs through collective action
- exchange views and ideas, and choose best options; and
- be in a position to enhance their bargaining power with other groupings, e.g. service providers.

For example, an individual may not be able to procure inputs for his/her operations due to high input and transaction costs. This can be achieved through joining an input group. Through bulk buying, the group may get a discount. Members can also share transport costs. Marketing groups help individuals in sharing transport costs and sourcing of markets for their products. Social groups such as burial groups have assisted members in meeting burial expenses from member contributions, which would have otherwise been difficult to meet. Building brigades assist their members in building houses collectively. By using the skills available in the group, even those members who would not have dreamt of owning a decent house benefit.

In a group, members can find support, the respect they need as well as achieve more success than they would have if they remained as separate individuals. What is true for a person is also true for a group. The goal chosen by the group is the key characteristic of the group. If the goal is understood and accepted by all members, you have the foundations of an effective group.

4.4.4 Characteristics of groups

A successful group acts as a single unit. As a group matures, it acts and reacts as a single unit to external stimuli, and members retain their individuality but form a part of a unit.

Some common group characteristics are summarized below:

- Group bond—measures the group unity level. This is often a factor of commitment to goals and values of the group. Common social, economic and cultural interests of members help to bind a group together. Major differences in these can lead to friction and conflict.
- Established communication pattern—how does information flow within the group? Which are the preferred and effective channels of communication?
- Structure—a group's structure may be formal, but also informal. Each member of the group occupies a position and there is a pattern of relationships among the positions. This gives the group the organizational base from which to seek participation.
- Rules and codes of conduct—the group will adopt 'the right way of doing things' for itself, by establishing codes of conduct. The group often shares common values and norms.
- Common interest/goal—which is shared by all members. The more members accept the goals of the group, the more effective the group will be. Groups respond as a whole to the stimuli directed to their parts.
- Cohesiveness—ability to work and stick together. The degree of interaction among the members of groups determines the strength or cohesion of the whole.
- Group size—usually varies from 20 to 30 members, although they may be smaller.
- Leadership—necessary to rally the efforts and interests of the group. This should ideally emerge from the group as it develops.

4.4.5 Group composition

Most group activities require a variety of skills and knowledge. Heterogeneous groups in terms of personalities, opinions, abilities, skills are more likely to be effective than homogeneous groups. The larger the size, the greater the diversity of talent, skills and knowledge likely to be present. Small groups may be less effective due to a limited range of knowledge. However, if the group is too large, new learning constraints arise. There is no single ideal group composition and size because other factors, such as leadership, cohesiveness and desire for consensus play an important role.

With reference to FGs for research and extension, it is important to have a voice for all categories of farmers, inclusive in one form or another (subgroups), all depending on the local context.

The selection of group members is crucial to the effective functioning of the group. Often there are no strict regulations so that groups can be flexible; changes in membership can occur quite frequently

(Kalonge et al. 1995). However, some FRGs have established specific criteria for membership. These criteria are often related to the social behaviour of potential members.

Other FRGs charge a membership fee, as a means to exclude those people that 'are not serious'. Researcher facilitators should see to it that the criteria for admission do not exclude certain important farmer categories. Internal regulations are often drawn up and stipulate, for example, that members should regularly attend FRG/FEG-meetings. If not properly planned, such regulations may exclude people from small households or might exclude women from participating. Sanginga et al. (2001) found

that FGs can be effective mechanisms to involve women and resource-poor farmers in agricultural R&D; these categories are often bypassed by conventional approaches. Although membership is on a voluntary basis, researchers can influence the choice of members, through facilitation on timing, structure and priorities for the group. A bias in FG members towards a certain category of households often happens when asking interested farmers to join the FG during a village meeting (community approach) or when they are selected by the local administration or the research and extension agents. Experiences with a few FRGs in regions with cattle owning households show that the cattle owning households are frequently over-represented (Kalonge et al. 1995). Therefore it can be useful to identify (categories of) farmers who are eligible to join the FG. When talking about different (sub) groups of farmers, the following categories could be thought of:

- farmers from different sublocations
- cattle owners and non cattle owners
- men and women farmers
- young and old farmers
- small-scale and large-scale farmers
- households affected by the HIV/AIDS pandemic and those that are not.

It is important to find out whether there are farmers who are interested but cannot or dare not join an FRG/FEG. It is known that experimentation often involves some risks. Resource-poor farmers might not dare to take such risks and special measures to limit their risk may be needed. Married women might think that they are not eligible and that only their husbands are. Facilitators need to discuss with (potential) FG members whether the group should be 'closed' or 'open' to new members after establishment. Advantages and disadvantages should be mentioned. How can facilitators influence the choice of members for an FG? If a PRA has been conducted in the village, it is likely that the various farmer categories of the village are already known. During the FG establishment meeting, R&D agents could discuss the specific participation expected from each of important farmer categories. Another way to ensure a balanced composition of the FRG is to discuss the heterogeneity among farmers during the establishment meeting.

There are some indications that FG membership tends to become more homogeneous, the more formalized they become. With an increase in specific obligations placed on its members (e.g. membership fees), less-advantaged farmers tend to be excluded. Researchers and extension workers should be aware that such situations might occur and try to encourage continued participation of a wide social and economic range of farmers. On the other hand, some R&D programs try to engage in an active selection of FRG members to involve research-minded farmers, 'innovator farmers' or 'commodity experts'. This approach is based on the assumption that such persons are more likely to provide ideas for new options (Sperling 1992).

Experience in Zambia showed that open groups that allow fluctuations in membership but which still can have formal membership have the following advantages (Kalonge et al. 1995):

- Interested farmers can join the group whenever they want;
- There is potential for improved group dynamics.

The disadvantages of such open groups could be:

- No continuity guaranteed in the group (farmers can join and quit when they want), which could constrain the sustainability of relations with extension and research;

- It will be more difficult to address long-term integrated issues such as soil fertility, agroforestry and pest management;
- The group could become too large.

The question of open vs. closed groups does not necessarily have to be answered by selecting either one of the two options. There are also possibilities of compromises between the two. For example, a choice could be made to have a core group of farmers who commit themselves to membership for several years. In addition to this, farmers can join the FRG for a specific trial for a specific period. However, for research purposes it is necessary to have at least a core group of farmers that collaborates during several years with research.

Participation in a group may also be influenced by the following relationships among group members:

- Junior vs. senior in a group—often senior dominates
- Male vs. female—often male dominates
- Rich vs. poor—often rich dominate
- Educated vs. less educated—often the educated dominate
- Knowledgeable vs. not knowledgeable—often the knowledgeable dominate
- Introverts vs. extroverts—often the extroverts dominate
- Young vs. old—often the old dominate

It is important to have a sense of existing hierarchies; putting young people with the elderly may mean that the young never have a chance to speak. Gender and age also influence the degree to which participants feel free to join the group.

4.4.6 Group size and participation

Empirical evidence shows that a group of 5–7 members usually works best for achieving optimum productivity and participation. However, due to cost constraints, normally a group is formed around 20–25 members. Some situations, such as microcredit, input acquisition and marketing may demand a larger group for it to be cost effective.

Various projects indicate that optimum membership ranges between 20 and 50 people, but groups of less than 20 farmers can also function well (Sanginga et al. 2001; Pretty 2003). Group size should not be determined by research and extension staff but be discussed with the members keeping in mind that often research inputs (researcher-time, seeds, implements) are limited. Large FRGs, on the one hand gain a wide range of experiences and are likely to include people from various farmer categories. However, on the other hand, such groups are sometimes characterized by a less intensive exchange of experiences among members; they tend to be more subject to social problems and are often difficult to manage (strong leadership is required). The ease of management of larger groups may be enhanced by creating subgroups of farmers, who implement a particular activity or trial, and by delegating tasks and responsibilities to subgroup coordinators. Small groups of 10–20 members maintain a greater sense of solidarity and mutual responsibility (Uphoff 1974; ASSP 2004). Small FGs seem more easily manageable and very dynamic; however, they risk representing only a small group of farmers and making the enterprise less efficient. It is likely that the more research inputs are provided free-of-charge, the more 'interest' there will be in participating in trials.

Experience in Tanzania revealed advantages and disadvantages of large groups (Kingma et al. 1998). Different advantages being:

- Many farmers can be reached by service providers;
- Dissemination of technology within the group will be quick;
- There are many experiences to be exchanged;
- It is more likely that various farmer categories are reached.

Large groups have, however, also disadvantages:

- Strong leadership is required;
- Farmers may not know each other well enough, which can cause distrust or jealousy;
- A large number of opinions and views are generated which may not be easily handled.

Research and extension staff should facilitate the discussion about group size, emphasizing tasks of FG members, avoiding false expectations, indicating that information about new technologies must be accessible to all villagers and seeing to it that FG members represent the various socioeconomic categories in the community.

If the size is larger, then there is limited opportunity for all members to fully express their opinions and limited interaction among members. This may lead to situations where more active members may strongly influence the group, i.e. a small vocal minority deciding for the majority. Some members may feel their opinions are left out. In some situations, the group may be further subdivided to enhance interaction due to time constraints. The degree of participation by individuals is also a function of group size. This is illustrated in Box 4.2.

Box 4.2. Group size and participation	
5–6 people	Everyone speaks
7–10 people	Almost everyone speaks One or two may not speak at all Quieter people say less
11–18 people	5–6 people say a lot 3–4 join in occasionally
19–30 people	3–4 people will dominate
30 people and above	Little participation possible

Source: IIED Trainer's Guide.

However, it should be noted that there is no single ideal group size. The specific environment, purpose and available resources may largely influence the size.

4.4.7 Female participation in groups

Often, women cannot easily express themselves in a mixed group and hence the need for special subgroups in such situations (Kelemework 2003). For example, it is already accepted that women often need to be encouraged to join FGs, which means in fact, influencing the composition of the FG to make it more effective in expressing the demands of this important group. The following strategies could be

followed to get female farmers involved and to better take note of their interests. First, it should be taken into account that female farmers are not a homogenous group, i.e. like between male farmers, there also exist many differences between women in terms of access to resources and their say in decision-making. Thus, a first distinction is to be made between women heading a household (female-headed households) and married women (members of male headed households). Each of these groups is likely to have their own interests and priorities and the way they are best involved can be different as well.

The following steps are advisable to enhance women participation in FGs:

1. Adjust the period and timing of the group meetings so that they fit within women's programs;
2. If necessary, discuss issues with women separately (in subgroups) so that they may feel free to give their opinions;
3. Try not to involve women only in activities with 'women's crops or tasks'. As women are an integral part of the household, they are also involved in activities dealing with less typical women's tasks or crops. Discuss with men and women how this involvement can best take place;
4. Include activities, which address women's specific problems and constraints.

In Ethiopia, few women participate in FRGs, also women do not speak out in groups dominated by men. The formation of subgroups for women was found to be a way out of this. The formation of women subgroups started with special attention for important priorities for women such as cooking quality of cereals and legumes as well as processing characteristics in general. These topics raised great interest amongst women (and not men) and on this basis, new priorities were established with the women subgroups of the FRGs which were then subsequently tabled in the larger groups (Asgelil and Tekalign 2001).

4.4.8 Classification of groups

The groups can be classified according to their legal status, hierarchy and functions (Figure 4.1).

4.4.9 Groups based on legal status

Depending on legal status, groups fall into three categories: formal, semi-formal and informal.

Formal groups

Formal groups are registered by an act of parliament and are legal entities with limited liabilities and can sue and be sued. Formal groups are created to carry out specific tasks to help the organization achieve its objectives. For instance, the two projects in eastern and southern Africa—the Regional Land Management Unit (RELMA) and Farm-level Applied Research Methods in eastern and southern Africa (FARMESA)—have areas of operation in which formal groups usually have legally binding constitutions and are registered under the Cooperative Societies Act or Companies Act. Behaviours that members should engage in are usually stipulated by and directed toward organizational goals.

Semi-formal groups

Semi-formal groups are listed through a local development organization as a formal grouping. Members of semi-formal groups usually make local arrangements to enforce their by-laws. Members sign a memorandum of understanding, each member keeps a copy and other copies are kept by the local development organization and the police. This listing is not legally binding but makes it easier for the groups to access funding and other services from registered organizations. In SSA, some of these

organizations are registered under the Ministry of Gender or Community Development or Culture and Social Services.

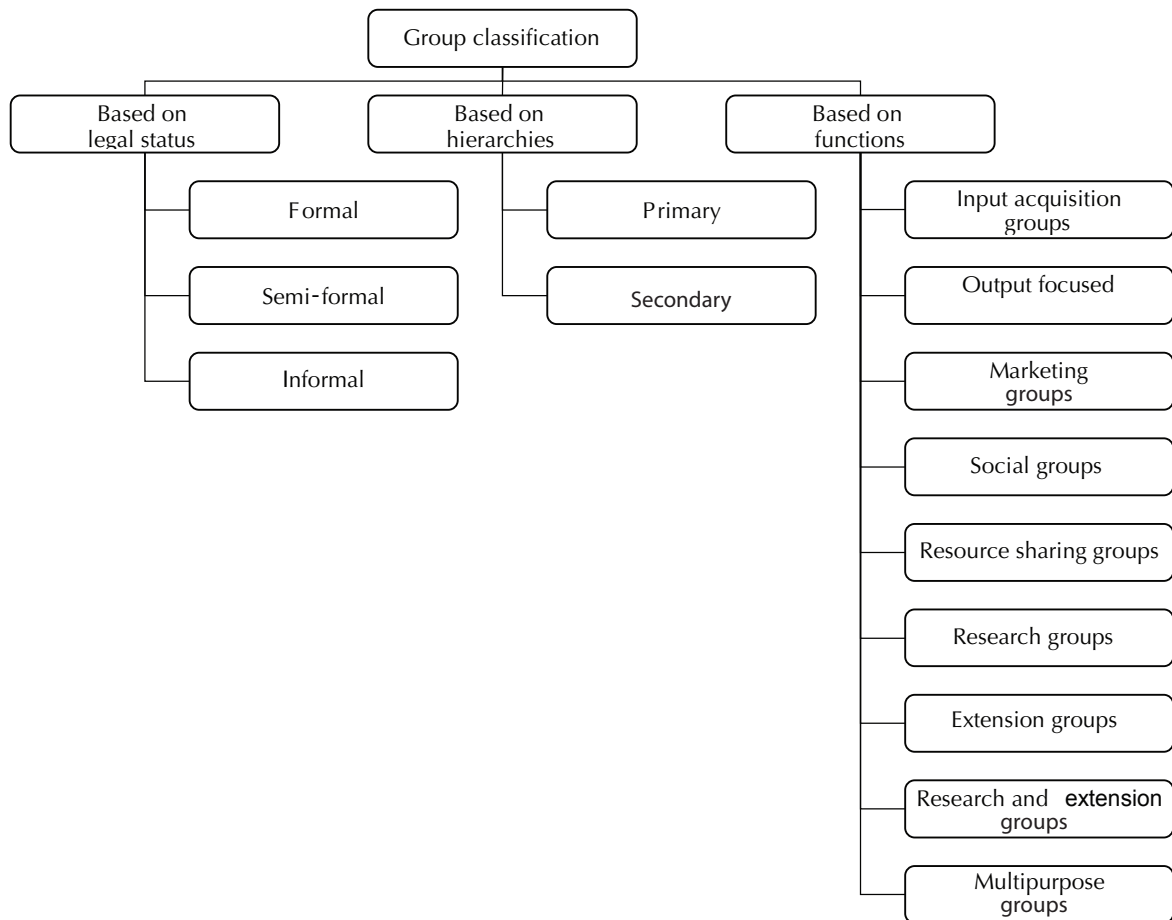


Figure 4.1. Classification of groups.

Informal groups

Informal groups are unregistered but have their own by-laws. Informal groups emerge whenever people come together and interact regularly. Most extension oriented and technology development dissemination groups are informal, e.g. seed multiplication groups. For most informal groups, the basic needs of the group members define the nature of the group that is formed. Informal groups provide a very important service by satisfying their members’ social needs. These types of interactions among individuals, even though informal, deeply affect the members’ behaviour and performance. In some countries, the informal groups are registered with the district council but these are not legal entities but some of the groups might have by-laws that all members understand and adhere to. This process makes it easier for such groups to access funding. These informal groups may disappear once the stated objectives are achieved.

Advantages of informal groups

- Perpetuate commonly held social and cultural values. Members usually share certain norms and values and these guide their behaviour and are further reinforced by the group members’ day-to-day interactions.

- Provide social satisfaction, status and security. Informal groups satisfy human needs for friendship and support as well as recognize individuality.
- Informal groups inform members about matters that affect them. The group tends to develop its own preferred channels of communication and information flows as well as modalities of operation.

Disadvantages of informal groups

- Conformity: By acting as reference groups, informal groups encourage conformity among their members.
- Rumours: Incorrect information can spread undermining the morale of the members or cause people to make inappropriate decisions.

Groups based on hierarchies

According to this classification, groups may be primary or secondary.

Primary groups

These groups exhibit the following features:

- Characterized by a high degree of intimacy;
- Bring out the social nature and ideals of an individual within a group;
- Members strongly identify themselves with the group;
- Members are often with similar background and experience and may live in the same locality.

Secondary groups

Secondary groups exhibit the following features:

- Characterized by the partial involvement and loyalties of members;
- Motive for involvement is what the group does to the individual and not what it means to the person;
- These groups may transform into primary groups.

Functional grouping

The third classification is based on the primary functions of the groups. Functional groups enable various types of group work to be done in such a way that both group interaction and program activities contribute to the growth of the individual and the achievement of desirable group objectives. In the context of rural development, groups may be further categorized according to the focal point of their formation. These categories are listed in Figure 4.1.

4.5 Group formation and development

People form or join groups for various reasons. What brings people together is the desire to solve common problems thereby satisfying individual needs and interests. Individuals have different expectations as to what the group will do for them. The motivation to form a group may be external to the community as in the case of groups formed through the intervention of research, extension or development agents, or internal where the idea to form a group is conceived by members of the community. In both instances, a group will only be formed when two or more people establish a relationship such that they begin to value one another's input towards the achievement of set goals. The formation and development

of groups is a process that both group members and external agents who work with groups need to understand so that they can make a meaningful contribution to the overall development of the community. This section describes the steps and stages in formation of groups starting with entering the community, and highlights the contribution that facilitators may make in order to aid the development of groups. The roles of community leaders are also identified. Common practical problems encountered in group formation and development are also highlighted.

4.5.1 Formation of externally facilitated groups

In the emerging participatory research and development (R&D) paradigm, the primary role of the development agents is to help communities take control of their lives and work together for their own benefits, i.e. act as facilitators. This involves the following steps:

Entering the community

The development agent's initial task is to gain the confidence of the community. This process takes time and he/she needs to show respect and interact with people from various backgrounds. The following are the steps involved in entering the community and building trust.

- Prepare yourself by gathering information about the community and its leadership. This information can be obtained from other developmental agents and/or secondary sources. Box 4.3 gives an example of the type of information to be gathered.
- Meet with local leaders, chiefs and other influential people in the community. Your goal is to explain your reasons for coming into the community. This dispels suspicion and builds rapport. Usually the local leaders will call for a meeting for you to meet all the villagers. In this meeting, explain your purpose and how it will improve the general living conditions in the village etc.
- Work to gain peoples' confidence by talking to them wherever you meet them, i.e. in the fields, at shops and in their homes. Talk to people about what interests them.
- Demonstrate your cultural sensitivity and show respect to community beliefs and norms.
- Show genuine interest in local issues.
- Adopt the behaviour and attitudes that characterize good RRA and PRA.
- Interact with all social groups, i.e. men, women, youth etc. Ensure that men in the village understand your motives for wanting to talk to women. Box 4.4 gives extra hints on creating rapport with women.

Box 4.3. Examples of information to be gathered

- Living conditions of different socioeconomic groups in the village.
- Needs of the community.
- The different ways in which the community solves its problems.
- Social and communication patterns in the community—who talks to whom and why.
- The communities' power structures.
- The informal and formal organizations (both for men and women).
- The links between the community and supply of services and who controls them.
- Preferred channels of communication.

Box 4.4. Creating rapport with women

- Treat women with respect and recognize that if they are cautious and reserved, it is because they are expected to be; it does not have to mean that they cannot contribute.
- Discuss with both men and women about the value of women's knowledge and experience, the importance of getting information from them and involving them in decision-making.
- If necessary, approach and contact women through male leaders and through women who are acceptable and easily accessible to them: the older, the wiser, the skilled and respected.
- Meet with women in places where they are comfortable, in the home, in the field, at the village well, or in places where they gather firewood, fodder and leaf-litter, rather than only in public meetings.
- Be aware of the heavy workload of women—do not act as if what they are doing is unimportant and can easily be interrupted to talk with you—be flexible to maximize your opportunity of talking with women without interrupting their routine.

Source: Imbach et al. (1998).

Steps involved in group formation

The steps involved in group formation are outlined in Figure 4.2.

Step I: Conception of a group

The idea to form a group to solve certain problems may be conceived and thought through by an external agent or by a member of the community. The idea may be sold to a few individuals who help synthesize this 'dream/vision' into a concrete plan of action. If the idea is conceived by a member of the community, the opinion of the development agents and or local leaders may be sought.

Step II: Mobilization or conscientization of 'would-be' members

The idea is sold to a wider audience in a meeting called for this purpose. Group proponents explain their vision to others and respond to issues raised.

Step III: Convergence of interested parties (getting consensus)

- Members meet to further discuss and cement the idea to form or join the group.
- A development agent may be called in to highlight experiences from elsewhere with regards to group formation. If the concept of groups is new to the area, an outline of a group maybe required. A visit to a well functioning group in the neighbourhood may be desirable.
- Explain that membership to the groups is voluntary.

Step IV: Birth of group

- group is given an identity—name and locality
- members elect a committee
- members agree on meeting days and venue
- members agree on desired membership
- extension agent may be invited to outline criteria for selection of leaders.

Step V: Setting of goals and objectives

- establish group vision
- set goals

- set SMART objectives to fulfill set goals (S = Specific, M = Measurable, A = Achievable, R = Realistic and T = Time-bound).

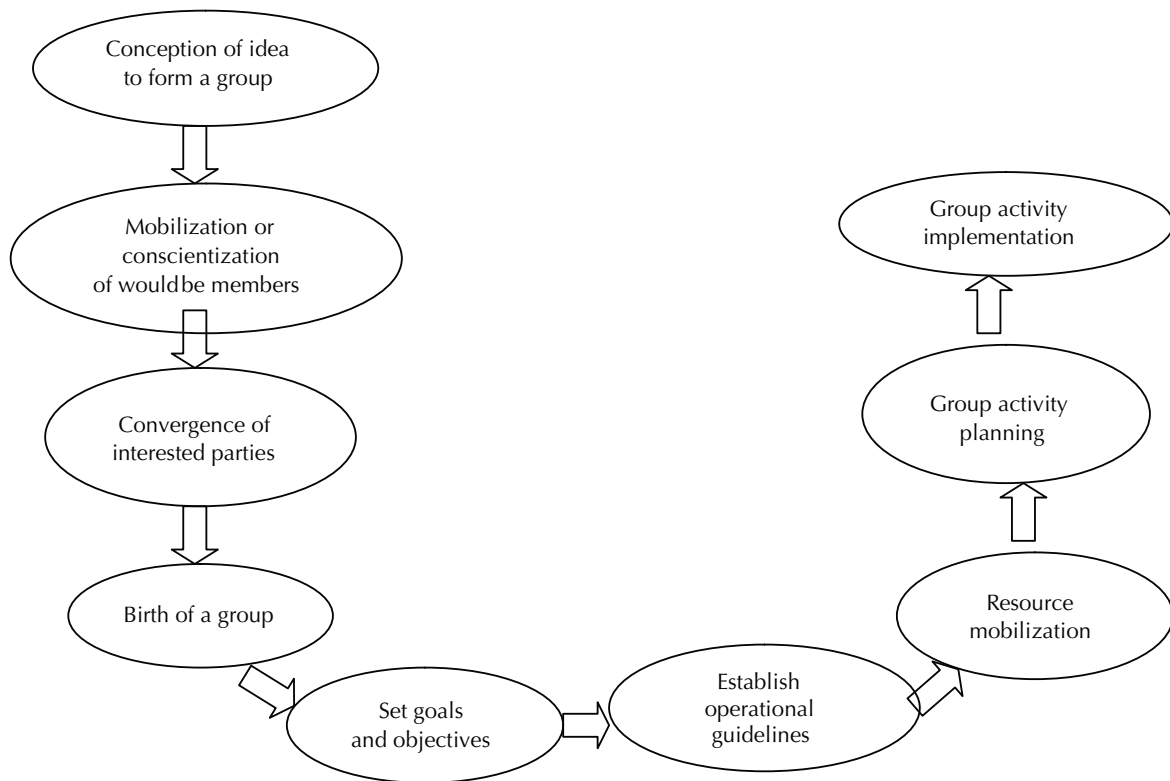


Figure 4.2. *The group formation process.*

This step may require input of a development agent so that tangible objectives are set and given a time frame to achieve the objectives.

Step VI: Establishment of operational guidelines

- Group develops constitution and by-laws.
- Extension agents and community leaders may be required to help identify potential areas of friction that need to be addressed and possible ways to avoiding them.

Step VII: Resource mobilization

Group identifies resources needed and what is available in order to reach their goals.

These resources can be classified as:

- i) human—skills, attitudes, interest, ability
- ii) material—equipment, raw materials
- iii) financial

The additional resources required need to be mobilized. Here the development agent can play a crucial role.

Step VIII: Planning of group activities

- Identify activities to be engaged in.
- Group outlines the steps they will follow in order to achieve set goals.

- Prepare a budget for activities to be carried out.
- Development agent may take members through the steps involved in planning of projects.

Step IX: Implementation of group activities

- assignment of individuals to tasks
- performance of tasks
- monitoring of performance against set targets
- evaluation/review of task performance.

The development agent may assist group leaders in managing the process and provide technical back up. He/she must make sure that monitoring and evaluation becomes an integral part of project implementation and ensure the beneficiaries' participation in the process.

There may be no clear boundary between the steps outlined above but put simply, this is how groups form. Once formed, the groups undergo a developmental phase.

4.5.2 Stages of group development

The five stages in the group development process (Table 4.1) are discussed in this section. Existing groups can be placed in any of these stages by observing their behavioural patterns.

In discussing these stages, an outline of what happens, people's reactions and the role of facilitators and leaders are outlined.

It should be noted that not all groups survive and thrive to achieve their set objectives. The groups can collapse at any stage. Some members may become disillusioned and withdraw at the forming stage itself. Some groups may fail to go through the forming stage and the group may collapse. It may not be easy to identify where a group is along the development curve as in some cases the group may be in two stages at the same time. Depending on the circumstances, groups may move back and forth among the different stages. Causes of group failure or success are also discussed in the following chapters. Where groups do not collapse totally, member dropouts may affect the groups at the different stages, as they become disenchanted or frustrated.

Some of the elements, which play a role in each of these stages and which have to be set out are rules relating to group leadership, membership and representativeness, group size and structure etc., i.e. the more structural forms of social capital. Group dynamics are also explained by cognitive forms of social capital, which relates to trust, local norms and values. Another element of group dynamics is the change over time of the group purposes. Social farmer groups are mostly older than productive farmer groups (Rondot 2004). After the storming stage an increase of inactive groups and the number of mixed groups can be observed (Sanginga et al. 2001; Rondot 2004). A shift will occur in the major purposes of groups, i.e. support for generating revenues, natural resource management, social purposes, training and information sharing and representation.

Table 4.1. *Stages in the group development process.*

Stage	Purpose	Behavioural patterns	Role of leaders	Role of facilitators
1. Forming (Testing and dependency)	For members to get to know each other Stage considered complete when members begin to think and see themselves as part of the group	<ul style="list-style-type: none"> Members look up to the group leader (chairperson) or facilitator to take the lead in charting the way forward Individuals test what behaviours are acceptable Brainstorming on the group's purpose, structure and leadership to establish clarity Members are anxious on whether they will measure up to expectations of other group members and whether the group will manage to execute tasks agreed upon Some members may complain on lack of progress (or exhibit high levels of intolerance) Some members may be withdrawn in discussions (observing the process). 	Community leaders at this stage are valued for instilling discipline in the deliberations, cooling down tempers, calling the audience to order and reminding members of desired goals	Point the way forward, assure the members that what is happening is normal to any group, share experiences from the past or success stories from elsewhere in order to motivate the group to move forward
2. Storming (Conflict)	To get the group organized	<ul style="list-style-type: none"> Members will have accepted the existence of the group Individuals may aspire and compete for positions as the group tries to establish a hierarchy of leadership within the group May lead to conflicts among members and polarization as other members take sides Relationships develop among members and 'cliques' may form Members are very defensive of their views resulting in in-fighting and competition for recognition Inwardly members are trying to balance group expectations (demands) with their other roles in the household and hence may be aggressive in pushing their points home 	Leaders are elected and are still trying to find their footing	Play the role of pacifier and may be required to remind the group to take all members' views on board, boost the confidence of elected leaders

Stage	Purpose	Behavioural patterns	Role of leaders	Role of facilitators
3. Norming (Cohesive)	For the group to establish a working relationship, agree on group norms, values and operational guidelines and become bound by them	<ul style="list-style-type: none"> • Members identify with the group and will defend its principles • Members openly discuss each other's ideas and criticism is constructive • Members confide in one another and share information freely • Emotions are expressed constructively • The group acknowledges skills and knowledge of members • Group open to ideas from both within and outside 	Significant role in conflict management within the group and between the group and other members of the community	Impart group management skills such as leadership, formation of committees, holding meetings, problem solving and decision-making
4. Performing (Maturity and mutual acceptance)	Working towards fulfilling their set objectives	<ul style="list-style-type: none"> • Creative problem solving • Feeling of interdependence among members • Critical comments are received positively • Members know each other's skills and behaviour • Willingness to consider change based on reasoning 		Impart monitoring and evaluation skills to the group, encourage the group to review their activities regularly and learn from their mistakes, encourage groups to 'widen' their horizons and think bigger each time
5. Transformation (Adjourning)	Would have successfully attained the goals set at establishment and find themselves 'blank' as to what to do next	<p>One or more of the following may happen:</p> <p>(a) Disbanding due to:</p> <ul style="list-style-type: none"> - objectives achieved but group fails to identify new areas of cooperation - benefits shared at project completion do not meet original expectations or individual member's perceived input - poor resource management, conflicts and theft of group property - disaffection of members with other members or the leadership - interference in group activities by development agencies/agents or political/traditional leaders 		Facilitators and local leadership play both an advisory and motivational role to ensure that members do not lose the spirit of cooperation and hence undermine the advantages of working in groups This can be done by helping groups analyse the results of the evaluation process Facilitators should encourage formalization, and formation of inter-group association and networking

Stage	Behavioural patterns	Role of leaders	Role of facilitators
	Purpose		
	Behavioural patterns (b) Diversification of group activities due to: <ul style="list-style-type: none"> - initial objectives being achieved - new confidence within the group to embark on new enterprises - new members being incorporated (c) Formation of splinter groups: <ul style="list-style-type: none"> - members from original group may break away to form new groups having gained experience from the previous group - members may keep their membership of the core group (d) Groups may be formalized (registered) and form larger groups with multiple objectives		

4.5.3 Problems encountered during group formation

Experience reveals that a number of problems may be encountered during group formation and development.

- Underrating member contributions.
- Stereotyping—it is difficult to form a group where there have been group failures in the past. The community believes nothing good can be achieved with groups.
- Competition for leadership positions.
- Political interference.
- Patronizing and ‘ownership’ of groups by development agencies/agents.
- Members’ failure to raise subscription fees especially poor and female-headed households.
- Meeting place and time not convenient to all members.
- Failure to accommodate the views of the marginalized members of society such as women, poor men and youth.
- Cultural beliefs—for example in some societies, young women may not accept membership of groups that include their in-laws, as they normally do not feel able to freely express themselves in the groups.
- Lack of transparency in decision-making.
- Lack of recognition of women’s leadership capabilities.

4.5.4 Group management

In this section tools that are used in managing groups are discussed. They can help development agents in guiding groups in developing a group vision, setting goals and objectives, developing by-laws for the groups and selecting effective leaders who can build and maintain groups (Table 4.2).

Table 4.2. *Tools used for group management*

1. Developing a group vision

It is critical for a group to have a vision, which will serve as their guiding light in identifying and defining paths to follow. The vision is often broad or general, in some ways it is like a dream. Often asking some relevant questions can help a group develop their vision. During this process the group debates, challenges, suggests, rejects and finally arrives at an acceptable vision and purpose.

Relevant questions to ask:

- What do you want to achieve?
- Where are you now?
- Where do we want to be?
- How are you going to get there?

Getting answers to the above questions will result in a vision for the group that can be realized by setting goals and objectives.

Example of a group vision: A community with improved livelihoods in which incomes are enhanced and members are free from hunger.

2. Formulation of group goals and objectives

When a group formulates its own goals, and objectives, it will always strive to achieve them whole-heartedly. Goals should be made clear to every one and guide the group in its long-term endeavour to better the lives of the group members. It is very important that the groups set their objectives in a manner that is clear and understandable to all group members.

Examples of an objective:

- Increased per capita food production by all members by year 2007.
 - Increased incomes for households of all group members by year 2007.
-

Issues to consider while formulating objectives:

- Members are heterogeneous with different needs and expectations.
- Consider all members' opinions by encouraging all to participate. All members should be able to clearly articulate the objectives of the group. During the process of objective formulation, members could be split into groups according to age or sex for maximum interaction and detailed discussions.
- If some members feel that they were not part of the decision-making process, cliques may form to the detriment of the group.

Objectives that do not conform to the above criteria will be very difficult to measure and evaluate. Once objectives have been agreed upon, it is advisable that each member of the group gets a copy of the objectives.

After doing this, the group should identify and set indicators for measuring achievements.

Questions to ask:

- How will we know we have succeeded?
- When should we have accomplished our targets?
- What will success look like or how will it feel?
- From what and whose perspective do we need to look at it?

Answers to the above questions will indicate critical success factors for group members to judge whether they are achieving their objectives.

The indicators should be SMART (S = Specific, M = Measurable, A = Achievable, R = Realistic, T = Time framed)

3. Developing work plans

Once goals and objectives have been set, the group needs to make definite plans to achieve them. This is done by formulating a work plan. Every group member should be made accountable for a particular activity, hence sharing the burden of achieving goals and objectives.

Questions to consider:

- What has to be done and when?
- Who has to do it and with whom?
- How should it be done?
- What resources are required and when are they required?
- Who will provide these resources?

Answers to these questions are used in developing the work plan.

4. Formulate group constitution

The group has to establish a number of operational procedures, frameworks or structure. These have to be strictly followed or adhered to or else effectiveness and efficiency of the group will be curtailed. The group's constitution and by-laws are the supreme documents that should guide the operations of any fully constituted group. Any group that does not have these may soon find themselves engulfed in problems.

A constitution is a document, which outlines the physical make up and operational procedure of a group of people. There are vital issues to consider in setting up a group constitution.

- Objectives of the group.
 - Membership: requirements to become a member, names, qualities, duration, responsibilities.
 - Type of leadership and qualities: types of posts, duties of committee, committee members etc.
 - Organizational structure: committees and their roles and responsibilities.
 - Disciplinary action against committee members: action if duties are not carried out, e.g. fines, dismissal.
 - Contributions: when to pay, fixing the joining fee, shares, purpose of contributions.
 - Disciplinary action against members: absenteeism, lateness, fines, and action on non-payment.
 - Record keeping: what to be recorded, by whom etc.
 - Savings: purpose, where kept, how to save, record keeping.
 - Profits and benefits: use, sharing, when and who.
 - Loans: rules of lending of group savings to members, interest rates, terms of repayment, penalties etc.
-

5. Formulate group by-laws

By-laws are rules and regulations together with associated penalties for breaching them. By-laws are used to:

- Instill commitment to the objectives of the group;
- Guide the operations of the group;
- Formalize the existence of the group;
- Ensure that those put in management positions follow set guidelines and to ensure discipline among group members;
- Ensure continuity of existence;
- Run the activities of the group and to guide the leadership of the group, i.e. meant to ensure constitutional compliance;
- Spell out rights and responsibilities of members.

Group by-laws should be in line with the objectives and the constitution. The group must look at each and every constitutional item and issues related to those items and then set disciplinary measures for breaking those issues. In all, by-laws should be set, understood, followed and accepted by all members. Ideally, each group member should have a copy of the by-laws to ensure transparency.

Some groups especially with more resources may opt to legalize their by-laws and constitutions by becoming a registered group under the Cooperative Societies Act or Companies Act.

4.5.5 Organizational structure of groups

Groups can have simple or complex organizational structures, depending on whether they are formal or informal, their group size and group activities. Commonly, group by-laws provide for chairperson, vice chairperson, secretary and vice secretary, treasurer, management committee and members. Each of these individuals plays a vital role in the management of the group. The suggested duties and roles of group members are presented in Table 4.3.

4.5.6 Leadership

The success and sustainability of any group depends mainly on the attributes or qualities of the leaders chosen to guide it. In order for groups to select appropriate people into leadership

positions, members need to understand the roles and responsibilities to be taken up by such leaders together with their styles. By studying the roles and functions of leaders in development and how groups can function efficiently, one can determine the good characteristics of the leaders that command good group work relations. These can be divided into the characteristics that are related to the needs of the group and those that are related to the needs of the leader as an individual. What is leadership?

Leadership is a process by which one person attempts to influence the behaviour of another or a group with the expressed purpose of achieving set goals. It is the skill of achieving results through encouraging people's efforts. The leaders should have a vision and commitment to the cause.

Table 4.3. *Duties and roles of various group members*

Member's position	Role
Chairperson	<p>Key person in the group. His/her role in general is to motivate, articulate and set the pace for the group in a friendly, participative but firm manner. In particular the Chairperson's role is to:</p> <ul style="list-style-type: none"> • Oversee the general activities of the group and keeps members up-dated • Preside over all group meetings • Guide the group to reach decisions and achieve their goals • Represent the group in other forums and be the spokesperson for the group • Arbitrate and motivate group members
Vice Chairperson	<ul style="list-style-type: none"> • Takes the chairperson's duties if he/she is absent
Secretary	<ul style="list-style-type: none"> • Invites or reminds people of the meetings • Writes minutes or reports of each activity undertaken by the group • Reads to the group all documents and correspondences received by the group • Custodian of group documents (minutes book, visitors book, materials received and issued, group plan book, work plans, members register and profile books) • Keeps a file of all group correspondence • Ask visitors to sign the visitor's book for the group
Vice Secretary	<ul style="list-style-type: none"> • Deputises for secretary if not around
Treasurer	<ul style="list-style-type: none"> • Collects all monies due to the group and acts as custodian to the group's petty cash • Pays all monies the group owes • Banks group funds • Keeps a record of all financial transactions, (bank book, bank statements, cash book, sales book, purchase book) • Keeps group appraised of its financial position at all group meetings • Produces simple financial statements at the end of the year <p>This post does not have and must not have a deputy. Where money is involved, only one person should be allowed to handle funds.</p>

Management committee members	<p>These include all the above members plus other selected group members; the number is determined by the group's constitution. Groups are, however, advised to keep an odd number of members of the committee in case of an impasse. The committee members:</p> <ul style="list-style-type: none"> • Represent the interests of other group members in committee meetings • Can hire, supervise and can fire the executive if not satisfied with performance • Moderate between the executive and members, in cases where the group has hired an executive • Follow-up on the resolutions of the group. This is achieved through formation of various task subcommittees (e.g. work committee, finance committee, disciplinary committee, loan committee), which report to the management committee <p>The management committee is answerable to the members</p>
General members	<ul style="list-style-type: none"> • They make the supreme body of the group, i.e. they attend the general meeting and elect or remove committees, adopt and amend by-laws • They make the laws, policies, set goals, guidelines etc. of the group

In communities we have different types of leaders who can and will directly or indirectly impact on the performance and/or management of groups. There are different views in communities about leaders. Some members believe that leaders are born while others believe leaders are made. The types of leaders commonly found in communities are presented in Table 4.4.

Table 4.4. *Types of leaders*

Traditional leader	<ul style="list-style-type: none"> • Many traditional leaders are born from certain lineages; they are endorsed and highly respected by their subjects • These leaders can be useful to groups in resolving conflicts and in cases of resource allocation
Professional leader	<ul style="list-style-type: none"> • Leaders by virtue of their professional engagements, such as extension workers, teachers, midwives/nurses etc. • Exercise their leadership through the execution of their professional duties • Groups should tap and effectively utilize the services of such professionals to their advantage
Political leader	<ul style="list-style-type: none"> • Usually voted by the electorate into leadership positions and are therefore accountable to the electorate. E.g. Members of Parliament, Councillors, Governors etc. • Wield political power and can strongly influence development in their areas • Groups should therefore use these leaders effectively for their development needs
Religious leaders	<ul style="list-style-type: none"> • Very influential and respected in communities • Can be helpful in conflict resolution, mobilizing their congregation for development, networking and sourcing funds
Opinion leaders	<ul style="list-style-type: none"> • Individuals whose advice in a particular subject is sought with relatively high frequency by others because of their experience and knowledge • These may exist even within groups and must be known by the group leaders and used to sway followers towards the attainment of group objectives. Failure to do so may result in opinion leaders, mobilizing followers against the group's leadership leading to friction in the group. They may easily influence the rejection of a particular practice or its adoption if they are ignorant of the subject or not convinced of its value (Dube 1998).

It is very important that all those in community leadership positions link up with each other. Each one must exactly know his/her position in the leadership hierarchy in the community as well as his/her role and limits in conflict resolution. Many groups' project chairpersons have taken it upon themselves to try and solve conflict issues that are beyond their powers. This often results in failure and protracted conflict cases. Without community leadership linkages, some groups may disintegrate when serious conflicts arise and the group finds that there is no mechanism or system to resolve it.

Leadership styles

The term 'style of leadership' refers to the behaviours of the leader in the discharge of his/her leadership functions, i.e. what he/she does, what he/she emphasizes and how he/she deals with his/her followers.

Leaders often depict one of the leadership styles described in Table 4. 5.

Leadership problems

In group formation, development and functioning, a number of leadership problems are encountered.

- Some leaders become manipulative of groups for personal gains.
- Some leaders want to be life leaders even if they are failing to deliver.
- Some people take up leadership positions for self-gain.
- Some leaders lack credibility in the community.
- Some lack leadership knowledge and skills and thus fail to motivate followers.
- Some fail to coordinate with various community leaders such as the influential traditional and political leaders, leading to fragmentation in the community, with each leader with a band of followers opposing the efforts of the other.
- Some leaders become very boastful of their position to the extent of abusing their authority.
- Some are poor communicators, resulting in their failing to properly articulate the affairs and issues of the community or group.
- Some leaders are absentee leaders—not always available to the people.
- Some leaders fail to delegate their functions in their absence.
- Some are scared of challenges from members of the group and then resort to using threats. They do not accept criticism resulting in members not giving objective criticism.
- Some leaders arrive late for meetings.
- Some delay starting meetings, keeping people waiting in the sun.
- Some gossip too much and are harsh with members.
- Some always call for meetings at short notice in order to manipulate the process of decision-making.
- Some are too old to run around organizing people and meetings but do not want to relinquish power.

Problems faced by women leaders

In a number of occasions women are elected as group leaders and tend to face some problems in executing their responsibilities.

- Lack of respect from male members.
- Even women are yet to fully accept fellow women as leaders despite some women proving to be capable leaders.

Table 4.5. Leadership styles.

Leadership style	Characteristics of the leader	Outcomes of the style
Autocratic/ Dictatorship style	<ul style="list-style-type: none"> • Orders and expects unquestioning obedience • Tasks done by leader without consultation, he/she thinks for the group • Leader controls, sets objectives and watches realization • Uses personal praise and criticism • Does not facilitate group participation • Does not allow initiative among the followers • Uses words like 'I', 'me', 'mine' • Does not delegate responsibility • Does not consider the welfare of members as important <p>This leadership style requires highly obedient and disciplined followers. However, it has the advantage that problems are facilitated and decisions taken. There are some people in communities who like this system because it is an easy system to follow. It takes away all the hassles of thinking and planning</p>	<ul style="list-style-type: none"> • Can be efficient in achieving group goals • Can create hostilities and aggression among members • High rates of dropouts or desertion by followers • Creates heavy dependency and less individuality • Loss of group cohesion and group development
Democratic style	<p>A democratic leader is one who upholds the interests of the common people. It is that style in which the people hold the supreme power. This is typical of leadership obtained through the ballot system. They seek group consensus and are often guided by majority group members' views</p> <ul style="list-style-type: none"> • People jointly formulate policies • Work tasks are from group decisions and participation, with the leader giving alternatives only • A democrat is fact minded in praise and criticism • Group participation is highly encouraged • Spends most of the time giving information and encouraging people to make own decisions democratically • Uses words like 'we', 'us', 'ours', 'ourselves' • Delegation highly encouraged • Ensures that the requirements for the group to develop cohesion and achieve tasks are balanced against the needs of the individual members of the group 	<ul style="list-style-type: none"> • Group mindedness and friendliness is created • More mutual praise; readiness to share group property • High degree of two-way communication • High rapport and friendship between the leader and followers • Emphasis on meeting group goals • More satisfaction in group participation

Leadership style	Characteristics of the leader	Outcomes of the style
<i>Laissez faire</i> style	<ul style="list-style-type: none"> · Leader does not interfere with the day-to-day operations of the group—minimized leadership · He/she provides requested resources and then only waits for results · Unrestricted freedom of work activities and process—group can act just as it wants · Group decides on how to use the resources, on who will do what, when and why · Group is given all the responsibility to deliver the results when they are needed · Information or help is rarely given 	<ul style="list-style-type: none"> · There is no development of group members · Members may not realise their expectations · Could result in little or no group cohesion

- Limited mobility to attend all functions on behalf of group due to husband's not granting permission disguised under the concern that household duties will not be undertaken.
- Gossip about women leaders by women.
- Suspicions of adultery.
- Multiple roles at home leaving women without adequate time to attend to leadership functions fully.

Selecting group leaders

Some problems encountered in selecting group leaders are:

- Members with leadership potential might decline to take up positions because of lack of self-confidence, perceived fear of victimization. If the member in question is poor, he/she might already have too many responsibilities.
- Members tend to select more vocal members to take up leadership and they might lack leadership qualities.
- Manipulative people tend to be selected in leadership positions.

Studying profiles of successful people and organizations, King (1999) noted that most of them would have at least 80% of the characteristics indicated in Box 4.5. A group will increase its chances of having effective leaders if they identify some of these characteristics in the members they choose as leaders. In addition, while identifying leaders, it is important to focus on how successful they are in their daily lives. A successful person is also likely to make the group a success.

Box 4.5. Qualities of a good leader

- Hardworking
- Innovative and visionary
- Collects and uses information objectively
- Acceptable behaviour that is in conformity with community norms
- Good rapport
- Good interpersonal relations
- Good mobilizer and can develop team spirit
- Commands respect and has self-discipline
- Good listener and understanding
- Patient
- Tolerant and accommodates different views
- Delegates and willing to share responsibilities
- Flexible
- Effective communicator
- Can empathize with group members
- Self-confident
- Honest and transparent
- Reliable
- Impartial
- Acknowledges and learns from own mistakes
- Good time managers
- Brainstorms frequently

Source: King (1999).

In discussing bad leadership with group leaders at a training workshop in Tanzania, (RELMA/SCAPA), the qualities of a bad leader were spelt out (Box 4.6).

Box 4.6. Qualities of a bad leader: The SCAPA/ULAMP experience

- Thinks he/she knows everything; is self centred and thinks of self as more equal than others
- Makes unilateral decisions
- Leaves the people to do whatever they want without his/her direction and involvement
- Does not listen to others
- Does not motivate members
- Does not solve members’ problems
- Only directs and will not participate

Source: RELMA

4.5.7 Group members—types and roles

There are three types of roles that members play in a group—task roles, group maintenance roles and individual roles (Table 4.6).

Table 4.6. *Different roles of group members*

Type of role	Characteristics
Task roles	<p>Those that help the group accomplish what they set out to do.</p> <p>Tasks may be assigned to individuals to:</p> <ul style="list-style-type: none"> • Promote maximum participation • Create checks and balances that will ensure success • Make members responsible for success/failure of the group • Make each member accountable to the entire group • Help members feel a sense of belonging to the group • Initiate new ideas or suggesting new course of action for the group • Seek information • Become good sources of information • Make issues clear to all members and facilitate deeper understanding of ideas • Summarize or conclude ideas and agendas • Build consensus and decision-making
Group building and maintenance roles	<p>These contribute to strengthening and facilitating the smooth running of the groups.</p> <p>In making a group function as a unit, some members:</p> <ul style="list-style-type: none"> • Encourage each other • Harmonize relationships and reduce tension in the group • Ensure that everyone participates • Ensure group rules are followed
Individual roles	<p>These are the roles performed by group members in order to satisfy individual needs in the group. It is important to understand each member’s individual needs and roles in a group for the group to succeed. When individual needs/roles are understood, it is easy to deal, train or sensitize such a member to conformity</p>

Individual traits determine the natural roles individuals play in a group. These are summarized in Table 4.7. It is important to know that group members are heterogeneous and we should learn how to harness them to achieve maximum group productivity. Identifying such role individual's play will help groups in accomplishing their tasks, build and maintain their groups while satisfying individual needs of members and minimizing the destructive tendencies of members.

Table 4.7. *Categories of group members, characteristics and allowable weaknesses*

Type	Characteristics	Allowable weaknesses
The Coordinator	The group's natural chairperson; confident, talks easily, listens well, promotes decision-making; able to encourage contributions from all team members, need not be brilliant intellectually	A bit manipulative
The Energy Plant	The group's vital spark and chief source of ideas, creative, unorthodox, imaginative	Lacks practicality, a bit of a handful; up in the clouds
The Implementer	The group's workhorse turns ideas into practical actions and gets on with them logically with loyalty; disciplined, reliable and conservative	Can only adopt if told why; lacks imagination
The Resources Investigator	The fixer; extrovert; amiable, good at making and using contacts; an explorer of opportunities	Undisciplined, short attention span
The Shaper	Usually the self-elected leader, dynamic, positive, outgoing, argumentative, pressurizes and seeks way around obstacles	Not always likeable, tendency to bully; provokes opposition
The Monitor/Evaluator	The group's rock; strategic, sober, analytical, introvert, capable of deep analysis of huge quantities of data, rarely wrong	Unexciting; plods; lacks imagination
The Team Worker	A counsellor; social, perceptive, accommodating of undercurrents and others' problems; promotes harmony; most valuable in times of crisis	Becoming notorious with some members
The Completer/Finisher	The group's worrier and stickler for detail; aware of deadlines and schedules; has relentless follow-up and follow-through, chief 'catcher' of errors and omissions	Reluctant to let go; worries about small things
The Specialist	The group's chief source of rare knowledge and skill, a single-minded loner; self-starting; dedicated and makes the occasional dazzling breakthrough	Contributes on a narrow front

Adapted from Pretty et al. (1995).

No one is perfect, and therefore each role or function is accompanied by an allowable weakness. This has the following advantages:

- Acknowledging these allowable weaknesses creates openness in the team;
- Individual team members feel more comfortable about not having to be perfect and feel free to concentrate on their strengths;
- The best teams are those that have a wide mix of types of roles and functions represented.

Some individual's behaviour in a group is so negative that it threatens to split the group. Examples of such behaviours include:

- i. Blocking: preventing the group from moving ahead by repeating the same ideas or returning to items already finished (Elephant and/or Frog type)
- ii. Aggression: criticism of persons or motives rather than ideas (Lion type)
- iii. Recognition seeking: calling attention to oneself by excessive talking, boasting (Peacock and/or Monkey type)

- iv. Withdrawing: acting bored and indifferent, whispering to a friend; not participating (Ostrich type)
- v. Dominating: interrupting, acting authoritatively (Giraffe type).

The common factor in each case is a person is seeking to satisfy his/her needs at the expense of the group. Members should be on the look out for these destructive tendencies and seek to understand and deal with them positively.

The necessary conditions for building team spirit in a group are:

- Trust among members;
- Free sharing of information—both technical and non technical;
- Having everyone fully involved in decision-making;
- Commitment to assigned responsibilities;
- Transparency and accountability by leadership and members.

4.5.8 Group members profiles

As already stated, a group is made up of members with different experiences, attitudes, skills, knowledge, expectations, needs, abilities etc. It is important that the group takes inventory of all the resources at its disposal so as to effectively use them.

The members' profile should seek to determine the following:

- The expertise of each individual in the group;
- Levels of education of each member;
- Skills possessed by each member;
- Work experiences of each individual;
- Individual interests of each member;
- Background of each member before joining the group.

A guideline may be drawn to seek the individual's profile. This guideline should include:

- Name of group
- Year group was formed
- Name of member
- Age of member
- Marital status
- Number of dependants
- Level of education
- District of birth
- Work experience
- Vocational skills
- Places visited
- Reasons for joining the group (expectations)
- Special qualities/characteristics if any

Groups should constantly reflect on the group members profile to check to what extent they have utilized members' skills/talents for the benefit of the group.

4.5.9 Meetings

Meetings are a critical tool for groups to succeed. A meeting is the gathering of a group of people to discuss or carry out a particular task. Group members and facilitators need to understand the role meetings play in the success of groups.

Types of meetings

Information gathering/sharing. This is because people think better when they have comments and reactions from others

- Consultation with each other
- Joint decision-making

Importance of meetings

- Generate information that can facilitate sound decision-making
- Increase members' participation and commitment in decision-making
- Allow group members to get together and discuss mutual issues
- Enhances transparency and accountability

Groups that do not hold regular meetings often fail; because meetings are a necessary tool in successful management of groups, it is important to know how to run them productively, i.e. effectively and efficiently.

To run effective meetings, one should spend enough time in preparing the meeting. Every meeting must have a purpose/objective, which all members should know. An agenda which would help achieve the goal should be developed. To make the meeting a success:

- Give ample time to members to prepare for the meeting, i.e. send notifications early enough—this will help ensure quorum;
- Meet in a central place, or one that is convenient for members, especially women and the elderly;
- Meet in a neutral place (avoid religious places, peoples' homes);
- Set a time that is convenient for all members, especially women;
- Begin and end the meeting on time;
- Meetings arranged during the rainy season should be later in the day and short, to accommodate the time limits of women members;
- Seating arrangements should be such that it encourages and generates open discussions from all members (e.g. semicircle), including women;
- As much as possible encourage and listen to all members' discussions/comments and contributions;
- Take minutes of the meeting (in summary form but be precise);
- Approved minutes and agenda must always be signed as a true record of the meeting; among those to sign should be the chairperson.

While conducting a meeting:

- have a clear objective
- have an agenda
- have a specific time frame
- encourage open discussions and manage differences of opinion

- be a good listener and monitor non-verbal communication
- be sure to conclude agendas
- make conclusions and recommendations precise and clear.

Many meetings fail because of:

- Lack of clear objective for the meeting;
- Poor preparation for the meeting, not taking responsibilities seriously;
- Chairperson/member dominates the meeting and fails to acknowledge views from members;
- Unsatisfactory answers from the chair or management committees;
- Repeating or inserting new items on the agenda during the meeting;
- Lack of respect for each other;
- Failure to give women and marginalized members a chance to give their views;
- Lack of respect for time.

Group discussion procedures in meetings

Proper discussion procedure can facilitate effective interaction of members. Some critical issues to be considered are outlined.

Develop a culture of listening

When people meet as a group to discuss issues, the culture of listening to one another, irrespective of gender, social, political and economic standing should always prevail. While a person talks, it must be understood that they have the floor and the right to be heard. Active listening shows that you respect and value their contribution. This builds trust and understanding amongst group members.

The necessary condition for effective listening is to 'have room' to attend to others. When listening, one should try to understand the other person's view without superimposing own views as this blocks communication.

When there are low levels of listening in group discussions, you get:

- Meetings dominated by a few participants;
- Cross talking between members;
- Loss of good ideas as they are not properly captured;
- Same ideas presented several times.

Eventually some of the group members will lose interest in attending meetings.

Effective seating arrangements at meetings

Some seating arrangements reinforce social classes, power and authority. To increase members' participation, make people sit in a comfortable manner. It must be kept in mind that members are supposed to be equal, and so places must be neither put one category of people in a better position or cause unease.

Circular, oval or horseshoe seating arrangements are the most ideal for group meetings as they stimulate face to face discussion with whoever is having the floor to speak to the group. Seating behind each other is definitely not the ideal arrangement for group meetings (CoratAfrica 1987).

4.6 Planning and implementing group activities

Once groups have formed and established a working relationship amongst their membership, they then start to engage in activities designed to fulfill the group's goals and hence reward the efforts of the members. Some groups start income generating projects designed to uplift their standard of living or embark on projects such as construction of pre-schools that enhance the social well-being of their children. In all cases, these activities should be planned for, in order to guide the process of implementing them. This section focuses on what planning is, how it is done, some tools used in planning and implementation of planned activities.

4.6.1 Planning

Planning can be defined as the process of deciding on what is to be done in order to achieve set goals. A participatory approach to planning should be adopted by groups so that whatever is to be done is derived through collective decision-making. Each member of the group should participate; give his/her ideas so as to achieve complete ownership, accountability and responsibility for the outcomes. The steps involved in planning and what needs to be done under each step is illustrated in Figure 4.2.

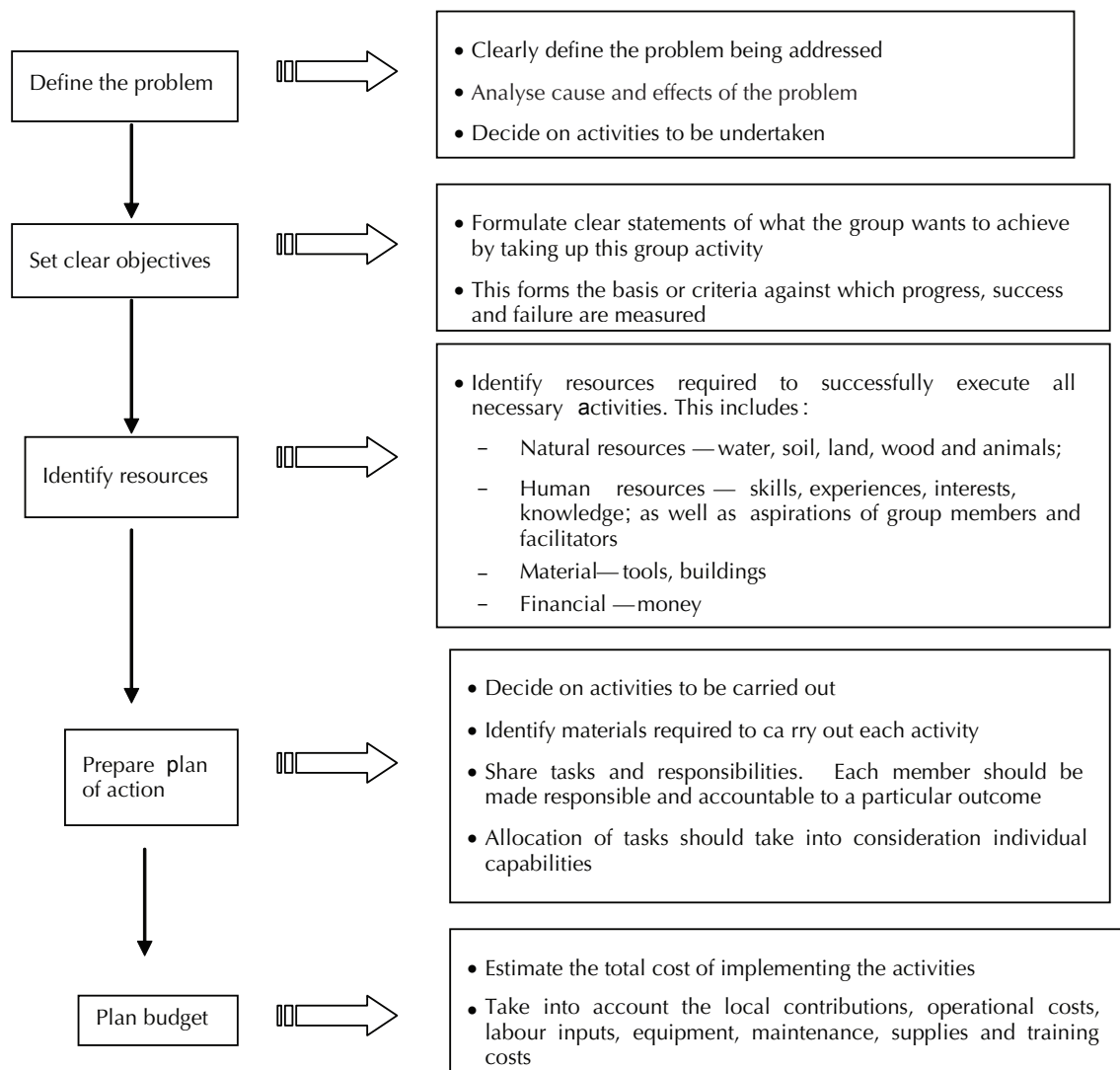


Figure 4.2. Steps in planning.

A template for work plan is provided in Box 4.7.

Groups use resources to achieve their objectives. These are either mobilized from within the group or externally through development agencies. Failure to mobilize adequate resources in time and use them effectively and efficiently has often led to the collapse of groups. It is crucial for members to clearly understand what resources are at their disposal and put them to best use.

Resources can be broadly grouped under three categories namely, human, material and natural. These are discussed in the following section.

Box 4.7. Template for a Work Plan.

Date: Group Name:.....

Objective:.....

.....

Activity	When is to be done?	Resources required	Person responsible	Output	Remarks

Human resources

Groups are composed of individuals who have a whole life of experience gathered during their upbringing, travels, employment and education. The individual's vocational skills, knowledge, aspirations and experiences are a resource to the group and can be accessed as long as the working environment allows the individuals to express himself or herself. What an individual has to offer to the group can only be known fully if each member's profile is presented to the group at the outset. The leadership of the group should also revisit this inventory with the group regularly. Groups normally acknowledge labour contributions of its members only and forget their mental capacity.

The local community, local leadership and available extension practitioners are also a resource that groups could rely upon for help. Members of the community have varied experiences and capabilities

they can offer the group. The community also offers a market for group products that are sold. Technocrats and local leaders (religious, political and traditional) are potential advisors to the groups. Available as they may be, the onus is on the groups to invite their contributions.

Material resources

These include physical assets such as tools, buildings, finance and livestock owned by the group. It may include products and building materials procured or donated to the group.

In addition to the assets owned by the group, it is important for members to realize that the tools they own as individuals that can be accessed for group work can be considered group resources. A group cannot fail to weed a garden just because it does not have hoes in its assets—it must access them from individual members who own such tools.

Natural resources

Natural resources such as land, water, forests, wildlife and fisheries belong to the community and groups can access them through the facilitation of the local leadership or local government institutions. In using these resources, groups are in direct competition with the community and this may attract conflicts. It is therefore critical that the group upholds the terms of agreement set by the local leadership.

During planning the group should carefully identify the resource needs. Adequate resources should be committed prior to initiating an activity. Timely provision of input is essential for successful completion of projects and activities.

To aid the planning process, the group may elect to use a project cycle or logical framework approach. The two are outlined below.

Simplified project/activity cycle

- i. Identify the problem either by survey or by collective discussion in the group. Someone who knows the group, for example, an extension officer or development agent, may facilitate this.
- ii. Put together data for further discussion. Identify areas that need further investigation and assign roles.
- iii. Share ideas and opinions on the technical feasibility of the project, consult field extension or development agents.
- iv. Break down the information into manageable parts, i.e. into stages of implementation.
- v. Identify those who will give some technical support to the project. E.g. service ministry, NGOs and other development agents.
- vi. Identify the positive/negative impacts of the activity (environmental, social-cultural and economic).
- vii. Find out the financial costs of the activity.
- viii. Determine how the funds will be mobilized in a realistic way. Note: for sustainability of the activity, the group needs to initially mobilize own resources.
- ix. Make a work plan and time schedule for the activity.
- x. Devise methods of evaluating the activity.
- xi. Implement the planned activity.
- xii. Evaluate the success/failure of the project.
- xiii. Use results of the evaluation to improve future performance.

Logical Framework (Project Planning Matrix)

The Logframe is a planning tool, which can help groups to understand the causes and effects between objectives in developing a project. The major elements are:

- Overall project goals
- Specific purpose of the project
- Anticipated project outputs
- Planned activities

Table 4.8. *A logframe outline*

I	II	III	IV
Narrative summary	Objectively verifiable indicators	Means of verification	Important assumptions
Goal	<ul style="list-style-type: none"> • Measures of goal achievement 	<ul style="list-style-type: none"> • Sources of information • Methods used 	<ul style="list-style-type: none"> • Assumptions affecting the output—purpose goal linkage
Project purpose	<ul style="list-style-type: none"> • End of project status 	<ul style="list-style-type: none"> • Sources of information • Method used 	<ul style="list-style-type: none"> • Assumptions affecting the output—purpose goal linkage
Outputs	<ul style="list-style-type: none"> • Magnitudes of outputs • Planned completion date 	<ul style="list-style-type: none"> • Sources of information • Methods used 	<ul style="list-style-type: none"> • Assumptions affecting the input–output linkage
Activities and resources	<ul style="list-style-type: none"> • Nature and level of resources • Necessary cost • Planned starting date 	<ul style="list-style-type: none"> • Sources of information 	<ul style="list-style-type: none"> • Initial assumptions about the project

Source: Anandajayasekeram et al. (1996).

The project planning matrix gives a summary of:

- Why a project is carried out
- What the project is expected to achieve
- How the project is going to achieve these results
- Which external factors are crucial for the success of the project
- How can we assess the success of the project
- Where we will find the data required to assess the success of the project
- What the project will cost

Logical Framework matrix is the end product of the planning process. LF should be operationalized in order to establish a need based monitoring and evaluation system.

4.6.2 Implementation

Implementation is the process of carrying out the activities that have been planned. The group needs to study the plan so that each member understands the various activities to be implemented by each of them. The requirements are as follows:

- Take time to discuss the work plan
- Understand the sequence of activities, time frame, each person's role and responsibility
- All participants should agree to the implementation schedule.

The basic principle to carry out the actions effectively is openness and teamwork. This is guided by the following:

- Everyone must be well informed about:
 - decisions made
 - the responsibility given
 - the time frame
- The work team chooses the area of work based on their strengths and weaknesses. Each work team may elect a leader for coordination of efforts;
- Everyone is free to raise issues as the process goes on;
- No one issues 'orders' or 'supervises' others during execution of activities;
- Regular review meetings are held that provide members an opportunity to share concerns, information and contributions;
- Flexible working hours are maintained in relation to other teams and for the project as a whole;
- Each work team record how it performs its tasks, materials used and outcomes. This information is vital for monitoring and evaluation activities discussed in the next chapter;
- Problems are solved as they arise;
- Accountability—members take credit for successful accomplishments, accept blame for failures, learn from mistakes and support one another.

4.6.3 Common reasons for activity failure

Based on past experiences a number of reasons have been identified for project failure. These include:

- Lack of local ownership/poor participation of stakeholders;
- Poor project preparation/planning including poor analysis;
- Bad project/activity selection;
- Poor implementation;
- Use of inappropriate technology, cropping systems and animal husbandry;
- Inadequate or inappropriate infrastructure;
- A weak support system;
- Failure to appreciate social and political environment;
- Administrative problems;
- Changing economic situations and market conditions;
- Externally driven project agenda/initiatives;
- Unrealistic expectations;
- Unsupportive policy environment.

4.7 Indicators of cohesiveness

Groups are formed for different purposes and are made up of different individuals. They operate in different settings and use various resources to achieve their ends. There are social pressures exerting on the group that impact on its ability to function. For the group to achieve its set objectives, it has to effectively manage these pressures and create an environment that facilitates the thriving of team spirit, the desire to achieve more and fosters selflessness. A failure to manage the social pressures that affect group action inevitably leads to lack of achievement of group objectives, followed by frustration and eventually, collapse of the group.

All groups want to succeed in their endeavours and hence need to understand what is critical to their survival—why some groups fail and others are successful, and what holds groups together. These are the group’s ‘hygiene’ factors, which if underrated, cause many groups to underachieve.

Although several factors contribute to the group performance, an attempt is made in this section to discuss some of the key factors only. These include group cohesion, motivation, resources, conflict management and networking.

4.7.1 Group performance

The term ‘performance’ refers to a group’s achievements. The performance of any organization or group is determined by three sets of factors: its environment, its motivation and its capacity. Group performance could also be assessed at two levels—the level of the individual member and the level of the group as a whole.

Group action depends on how individual members joined the group, their perception of the activities being undertaken, and how they apply themselves to execute the planned activities. Based on the past experience one could identify a long list of factors that contribute to successful group formation and subsequent behaviour and performance. The features of a successful participatory farmer group are summarized in Box 4.8. The common causes of group failure are presented in Box 4.9. The factors affecting group performance are summarized in Figure 4.3 and the key factors contributing to group performance are discussed in the following sections.

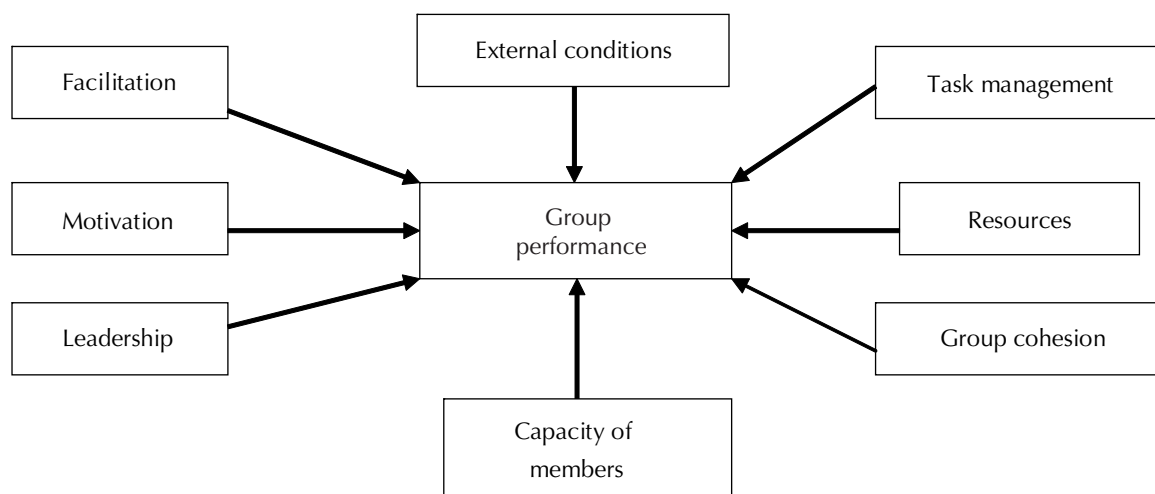


Figure 4.3. Factors affecting group performance.³

4.7.2 Group cohesion and motivation

In an ideal situation, it is expected that a group will respond as a whole to the stimuli directed to its individuals. This is based on the premise that there is a power that pulls individuals to the group. A group as a unit can be likened to an individual and as such exists in a field with an interplay of forces. This field consists of desires, motives, frustrations and avoidance associated with various objects and events in a group’s life. These objects and events push and pull the group in many directions and if not overcome in time, will lead to the collapse or disintegration of the group.

3. These factors can have their own set of interaction, which may also affect group performance.

Cohesion

The ability or degree to which individual members of these groups are attracted to one another and identify with each other and the group is called cohesion. Piper (1993) defined group cohesion as the attractiveness of the group to its members, together with their motivation to remain as part of the group and resist leaving it.

Box 4.8. Features of a successful farmer group

- Good interpersonal relationships
- Common cultural background
- Clearly stated objectives and work plan
- Shared vision and common goal
- Group members identifying themselves with the problem being addressed
- Equal treatment of members—all members feel equal and are treated equally
- Strong visionary leadership that is accountable to the group
- Active participation of all members in decision-making
- Transparency in decision-making and action
- Adherence to the operational guidelines and by-laws
- Open communication at all levels and sharing of information
- Maintenance of clear records
- Fair distribution/allocation of responsibilities and duties
- Clear performance indicators—time dependence
- Effective and functional monitoring and evaluation system
- Regular self-appraisal by group: Action-Reflection-Action Mode
- Mutual respect among group members, willingness to help each other
- Strong group identity
- Willingness to give and receive advice, and learn from each other
- Honesty and hard work
- Good financial accounting
- Non-threatening environment
- Efficient use of group resources
- Imagination and innovativeness
- Ability to identify and solve problems related to group functioning
- Well-planned and effectively managed group meetings

Source: Ministries of Agriculture, Community Development, SCAPA and ULAMP.

The cohesiveness of a group can be seen by the degree to which members want to remain in the group, to contribute to its wellbeing and aims, and to join in its activities. It is therefore a critical requirement for the success and performance of groups. Evidence of group cohesiveness is reflected in several ways. The determinants of group cohesion are summarized in Box 4.10.

Indicators of cohesiveness

- The more difficult it is to get into a group, the more cohesive the group is;
- A cohesive group tends to have the ability to withstand external threats; and
- All members tend to take credit/criticism for success/failure.

Motivation

Motivation can simply be defined as a reason to act. It is the energizing and control of purposeful behaviour towards specific goals. It examines the arousal of an individual's inner drive to want to act in a certain way. This force that makes an individual want to act may come from inside the person (intrinsic) or from outside (extrinsic).

Box 4.9. Common causes of group failure

- Lack of clearly defined objectives and performance standards
- Failure to translate decisions into action
- Dictatorial leadership
- Nepotism/corruption
- Lack of transparency in decision-making and implementation
- Inadequate knowledge about group dynamics and group functioning
- Mismanagement of group funds (resources)
- Lack of commitment and sense of responsibility by members, i.e. lack of accountability by group members and unequal commitment to group activities
- Lack of self-appraisal
- Failure to adhere to guideline and by-laws
- Gossiping
- Lack of willingness to learn from others; failure to accept constructive criticism
- Poorly planned and unproductive meetings
- Under-rating member contributions
- Power struggle within the group; conflicts between group members

Source: RELMA Laikipia Workshop Report; FARMESA Zim 98-04 Project Report.

Box 4.10. Determinants of group cohesiveness

- Similar socioeconomic and cultural settings
- Clear group identity
- Good interpersonal identity
- Placing value upon being a member of the group: pride
- Lack of anxiety; relaxed atmosphere
- High levels of satisfaction
- Greater levels of cooperation and enthusiasm
- Upholding the principle 'an injury to one is an injury to all'
- Willingness to share knowledge and responsibility
- Time spent together
- Smaller the group size, the greater its cohesiveness; need to establish the optimum size to achieve reasonable level of cohesion
- Gender make up of the group
- Severity of initiative/entry requirements

There are three forms of motivation:

Fear

The individual acts in a certain manner due to the fear of consequences or reprisals that may follow failure to act as expected. This is normally short lived as individuals may develop coping mechanisms.

Incentive

This is based on the 'dangling of a carrot stick' in front of an individual or group with the hope that the desire for this carrot will drive the individual or group to act as per expectation.

Attitude

Based on how people think and feel. The person discovers his/her internal reasons for doing things based on self respect and respect for others. The individual's beliefs, faith, self confidence and self image contribute to make attitude related motivation.

Principles of motivation

- The perceived reward must always be greater than the perceived price/cost.
- Clearly evaluate the benefits.
- Use your imagination to dream and visualize: this creates passion and passion precedes conception. Whatever the mind conceives and believes in, is achieved.
- Establish where you stand now in relation to where you want to go. This enables you to establish your current level of awareness. Once you know where you are it will help you to plan to get where you want to go.
- Set realistic expectations.
- It is impossible to motivate someone by telling them what they should, ought or must do if they are not definite about ultimate objectives.
- Create an atmosphere of motivation by being supportive to people in their growth and self-belief.
- Find the reason why you do things—that is the psychology behind your motive for action.

How groups can achieve high levels of cohesion and motivation?

The following are some strategies or ways that could help groups stay cohesive and motivated.

- Songs—each song carries a meaning and is sung at different times depending on situations. To sing a song requires individuals to 'knit' their voices. If groups compose their own songs and sing them during their activities, they realize the power of songs as a uniting force. It helps the individuals 'see' the need for one another and gives them a sense of identity.
- Uniforms—help strengthen individual's sense of belonging, taking from that 'birds of a feather fly together' (applies to even hats, t-shirts etc.)
- Setting milestones or landmarks to point the way. This will enable the group and individuals 'see' the way and take stock of achievements or their lack easily.
- Continuous self-evaluation and action. Results of this evaluation should be used to improve the group's performance.
- Continuous review of groups and individuals' objectives of joining the group.
- Visitation and encouragement by local leadership for groups to persevere even in times of difficulty. Visits by local leaders to the group reward the groups by way of ideas and advice and endorsement of the group's existence in the 'eyes' of the community.
- Setting clear objectives and a plan of action showing how the objectives will be achieved.
- Composing dramas and poems that the group play and recite together. Issues could include

reflections on the life of the group since its formation to the present.

- Fair settlement of conflicts.
- Adherence to set 'ground rules'.
- Participatory decision-making and action.
- Transparent and effective use of group resources.
- Open communication and constructive criticism.
- Effective, accountable and exemplary leadership.

4.7.3 Conflicts and conflict management

As with any social unit, conflicts within groups will always arise: what matters most is how it is managed. Conflict, depending on the types, may be harmful or beneficial to the group. Generally it is poor management of conflicts that weakens groups as it may lead to dissatisfaction of members, withdrawal or total collapse of the group.

Definition of conflict

Conflict arises when the hopes, desires, needs or activities of individuals become incompatible in a group or organization. It involves people's feelings. Most conflict arises from the way people behave with each other in a particular situation (Taylor 1989).

Forms of conflict

- Controversies—normally take place over disputes, ideas of what is right or not, what ought or ought not to be, how or how not etc.
- Conflict over needs—arises mostly due to competition for resources or their uneven allocation. It is the result of stifling of differences, which attempts to overlook the issues of choice and priority.
- Development conflict—arises due to the need for relocation adjustment, response to new demands, to changes in activities and purposes, which result in a deviation from the *status quo*.

Causes of conflicts in groups

- Gossiping of member(s) within the group and outside.
- Theft of group assets or products.
- Failure to adhere to by-laws or constitution of the group.
- Personality clashes.
- Unequal application and commitment to group tasks or activities.
- Lack of respect of members by leadership and vice versa, and among members.
- Dominance by some members.
- Misuse or misappropriation of group resources especially in the case of projects.
- Lack of understanding of project activities by group members.
- Dictatorial leadership.
- Unfair distribution of tasks.
- Failure by members or leaders to give feedback to the group after being given assignments.
- Infidelity among members of a group.

Beneficial aspects of conflicts

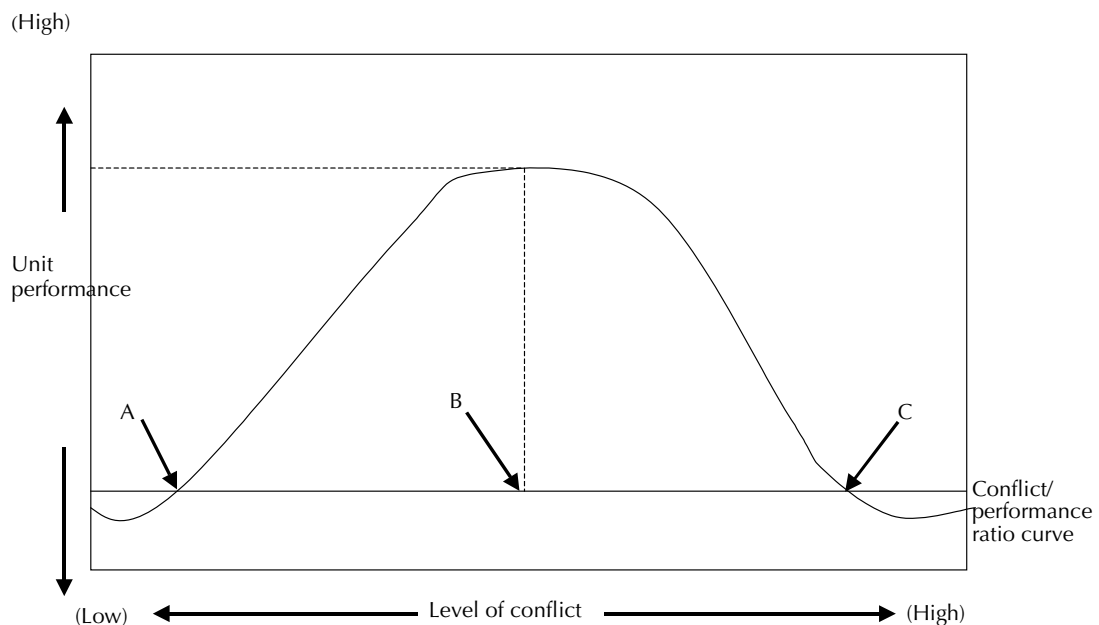
Conflict in a group is considered good if it results in the following:

- Brings problems and issues into the open for discussion;
- Promotes creativity, generating new ideas and work practices;
- Focuses people to give their work more detailed analysis;
- Increases commitment to take part and to become involved in group activities;
- Improves the quality of decision-making;
- Deepening of relationships between those involved in the conflict.

Undesirable aspects of conflict

- Creates stress, stirring up negative feelings.
- Makes working environment less pleasant.
- Causes lack of commitment to group activities.
- Severely reduces the effectiveness of communication process.
- Interferes with coordination of efforts between groups and individuals.
- Stifles member contributions.
- May lead to factionalism or withdrawal of members.

Up to a point there is a complementary between conflict and unit performance; beyond these points, however, it will definitely have negative effects on performance. Figure 4.4. illustrates the relationship between conflict and performance.



Source: Brooks (1999).

Figure 4.4. Conflict and unit performance.

Situation	Level of conflict	Type of conflict	Unit's internal characteristics	Unit's performance outcome
A	Low or none	Non-functional	<ul style="list-style-type: none"> • Pitiful • Non responsive to change • Lack of new ideas 	Low
B	Optimal	Functional	<ul style="list-style-type: none"> • Viable • Self-critical • Innovative 	High
C	High	Non-functional	<ul style="list-style-type: none"> • Disruptive • Chaotic • Uncooperative 	Low

At point A both conflict and performance are low. This could be due to low levels of activities that aggregate conflict. Point B is the optimal point where both conflict and performance are high but conflict is well managed and properly used to enhance performance. At Point C there is too much conflict that crowds out performance.

Managing conflicts

It is important to note that conflict, performance and change are partners, never apart. Groups must accept the inevitable and be prepared to react when necessary. What is paramount is that groups create a climate where conflict is seen as healthy and valued for the results it creates. A group with no conflict could be perceived as complacent and self-destructive, with little creativity.

Managing conflicts by individuals

- Withdrawal

Taking the retreat course.

- Smoothing

Seeking to establish and then emphasize the areas of agreement and avoiding the areas of disagreement. This is done with the hope that areas of conflict become minor and are eventually subject to compromise.

- Compromising

Each side starts from a rigid position but expressing a willingness to search for a solution. Allows both sides of the conflict to feel they are satisfied with the amount gained as well as the amount lost.

- Coercing

Exerting an opinion or view at the expense of the other. This is characterized by competitiveness leading to a win–loss result that ultimately becomes a loss–loss result due to the damaged relationship.

- Confrontation

Facing the conflict directly to cause face-to-face debate and discussion of the disagreement and deriving options for resolution. This often defuses a violent situation and reduces the conflict to a level where compromising or even smoothing can resolve the conflict.

Managing conflict at group level

- Mediation

Some conflicts may need the interference of external forces once the group and its leadership have failed to handle it. Groups exist in societies, and have access to political, traditional and religious leaders, particularly in rural settings. In the RELMA/FARMESA region in Africa, conflicts are usually referred to the traditional leaders for settlement. This is the case for both conflicts among members of a group or the group and members of the community. The mediator role of traditional leaders has always prevailed in the local custom and has since been endorsed by government by an act of parliament. The decisions are well respected.

- Elimination of the conflict party/parties

Members that oppose or disrupt the groups' aims and objectives are driven out of the group. This can happen through punishment, bad talk or just ignoring their wishes. This means that the opponents must

go and their reactions are on the lines of 'we give up', 'we are insulted' or 'we are going to make a group of our own'.

- Suppression of the minority

The group suppresses those with contrary opinions by any means they have. The minority is expected to listen and cow down to what the majority wants and thinks is best for the group (or for them). For some time this strategy will work because the minority is afraid, but sooner or later tensions and hostility will become so strong that the group will break apart. Voting is actually a smoother form of suppression as well, because there will always be a winning majority and a losing minority.

- Agreement

The majority rules and decides, but the minority does not feel oppressed by that and agrees to what is opposed.

- Alliance

The different parties do not give up their different opinions, but they agree on a common point to reach a step both think is good for them. The conflict is still there; it is just sleeping for a while, until the step or the short-term goal is reached. If that is done and the conflict is still there, it will arise again.

- Compromise

When the parties involved in a conflict have about the same amount of power and cannot oppress each other, they will look for a compromise. Each group gives in as much as it thinks it can stand to in order to reach a better solution in the end. Conflicts are very often solved like this. The parties think 'better to give in a little bit to reach some sort of solution than none at all'. But they are not fully happy about the final solution, as it is often less than they expected.

- Integration of the different wishes into a new one

This form of solving a conflict is the best, but also the least common. The different opinions are discussed, weighed against each other and measured against the common aim. The whole group is involved in the conflict solving process and each member takes care that his/her wishes are recognized as much as possible. The solution can differ from the wishes of the conflicting parties, but the newfound solution could be an even better one than the ones that existed before. Something new was created by involving everyone.

As a general guideline, parties in conflict must be encouraged to identify and agree on the areas of full agreement and the areas of disagreement. Effective conflict management is dependent on persuading everyone involved to listen, to understand, not to evaluate and criticize. Apology and reconciliation is critical to the sustenance of peaceful work relations in groups. Reference to the group's by-laws, if they include the necessary sanctions to be preferred on trouble causer, will aid the group in suppressing dysfunctional conflicts.

Approaches to conflict resolution

Identify areas of conflicts

These can be identified by agreeing on the original goal and noting any obstacles hindering the group members from achieving the already agreed upon goals by doing the following:

List all problem areas

- Prioritize problems and take the highest ranking.
- Discuss the core problem and reach a common understanding.
- Identify the factors causing the problem.
- Come up with basic solutions.

Controlling and maintaining difficult members

- Use members to evaluate every group activity undertaken.
- Hold member-centred meetings (having everybody feel appreciated).
- Make available on time, all previous meeting information to prevent speculation or rumours.
- Allow members to express themselves freely.
- Encourage, generate and share information from silent and fence sitters.

Aspire to have a productive group

- Ensure there are equitable responsibilities and avoid domination by a few.
- Evaluate group performance.
- Engage in productive group activities, e.g.
 - initiating new ideas
 - clarifying issues
 - seeking new information (especially from professionals)
 - motivating and rewarding members

Calling for expert help

- Consult relevant bodies to solve specific problems, e.g. social services, provincial administration, technical bodies and seeking assistance of facilitators.

The conflict facilitator should:

- Aspire to be accepted by the conflicting parties
- Remain impartial
- Create human contacts among conflicting parties
- Pinpoint conflicting issues and agree on procedures to address these issues
- Let the conflicting parties explain their views with minimum interruption
- Invite the conflicting parties to negotiate.

4.8 Monitoring and evaluating the role of FGs

Sanginga et al. (2001) developed detailed performance criteria and indicators for the monitoring of the participation of FGs in agricultural innovation (Table 4.9).

Some PRA tools have been developed to assess the functioning of FGs. Some of the tools can be used annually, others less frequently. These PRA tools allow discussion and analysis with the FG members: the functioning of their group, the representativeness of the group, the group's role in dissemination etc. The data collected in regular monitoring should be used as an input into evaluation. Extension staff is normally responsible for collecting the monitoring information concerning the minutes of the group meetings. Researchers and extension staff should be jointly involved in the use of PRA tools to determine opportunities and constraints, and to decide on plans for research and extension. The recommended frequency of these planning meetings using PRA tools is once a year.

Table 4.9. *Criteria for monitoring and evaluating of farmer groups*

Performance criteria	Performance indicators (to be quantified)
Social capital (bonding)	Cooperation, trust, collective action, cohesion, compliance, diversity, heterogeneity/homogeneity
Human capital	Technical knowledge of members, new farming, self-esteem and confidence, skills, attitudes, innovativeness
Group organizational capacity	Formation, objectives, leadership, structure, norms and rules, regulations, decision-making, meetings, activities, records, dynamics
Participation process	Meetings, activities, decision-making, communication, dynamics, women
Experimentation/research activities	Experiments, technologies, farmer researchers, extent, output
Social capital (bridging)	Contacts, initiatives to contact, collaboration, exchange visits, field days, visits
Reach or dissemination	Community relations, information sharing, farmer-to-farmer dissemination, sharing experience
Sustainability	Financial contribution, diversification, vertical links, initiatives, plans, external dependence

Supplementary to the regular collection of data, a survey among a sample of FG members can be conducted using a questionnaire and checklist. Such a survey provides information on the group composition, opinions of members on accessibility of the group (fees) and on joining the FG, knowledge of individual members on the group functions, its trials and other members, experiences with meetings and local experimentation etc. The survey will give descriptive information on the FGs involved, explain how and why farmers participate in the FG and describe farmers' opinions. By focusing the survey on a sample of FG members, an overall picture of the FRG will be lacking. Individuals give the information, which has its advantages and disadvantages. One of the advantages is that issues difficult to discuss in a group, such as personal views and opinions, for example, on membership fees, can be touched upon. A disadvantage is that the FG is not approached as a group whereas the monitoring and functioning of the group should be a common concern, which needs to be discussed by all the group members together. Survey information can also be used as a baseline for the exercises with the PRA tools.

4.8.1 PRA tools for PME

A large number of PRA tools can be used for participatory M&E. The referred tools relate to the different types of social capital, i.e. bonding, bridging and linking types. Some commonly used tools are (KIT/World Bank 2000):

1. Checklist for group discussion

The checklist aims at collecting data that are needed for an accurate description of the FG and is related to the objectives of FG establishment and the FG functioning. The checklist often comprises two parts: the first part focuses on general background information of the group, the second part focuses on specific questions related to the functions of the FGs in innovation, as seen by the researchers (i.e. partners in research), by disseminators of technology (extension staff) and by farmers themselves. An observed advantage of the checklist was that some important neglected issues were raised and discussed (e.g. participation of disadvantaged households, leadership and expected roles of all parties). The information collected with a checklist is used as an input into the FG discussions and also for verification. To make the discussion more lively and visible, visual PRA tools can also be used.

2. Mapping of group structure

One visual PRA tool is the mapping of the group structure in terms of leadership, membership, geographic location etc. Important elements in this are the lines of communication within the group and the community and the way the group is managed also in relation to the rest of the community. Both group structure mapping and social mapping relate to the bonding type of social capital (within the group), as well as the links with other groups in the community.

3. Social mapping

This tool relates the composition of the community in comparison with that of the FG and can be used to analyse and discuss the socioeconomic composition of the group. In order to avoid too big a bias towards one group of farmers, the socioeconomic composition of the group can be analysed and discussed.

4. Venn diagram

A Venn diagram is used for the analysis of bridging social capital of the group to other groups (outside the community) and the linking of social capital of the group to other stakeholders. This will also help analyse the possibilities of dissemination of verified and released technologies. Furthermore, relations with other institutions, which are important for the functioning of the group, can be discussed. The tool is equally helpful for self-monitoring of groups over time and can develop into an indicator for group empowerment if the level and intensity of links and communication is indicated.

5. The SWOT analysis

The SWOT analysis provides researchers, extensionists and FG members with the perceptions and opinions of the latter on the functioning of the FG. A spider diagram for the different stages of research can be used here as well (Sanginga et al. 2001).

The different M&E tools all provide information on the functioning of the FG, although not in equal degrees. The survey and PRA tools are tools that need not to be used frequently. Data collection on the meetings needs to take place at regular, frequent intervals. However, which tool to use depends strongly on the objective of the data collection and the degree of involvement of farmers in the process of monitoring and on-going evaluation. Monitoring of FG development and functioning by research is more intensive during the initial years and then can become less intensive once the FG functions as a dynamic group and group consciousness is built. In this process of group building, it is worthwhile to know which research and extension activities an FG should start with. One could think of trials responding to a priority need of all groups or households and activities that give results on the short term. In this way, an FG will be motivated to continue to participate in research and development, and the benefits of participating become clear quickly. Monitoring aims at both monitoring of organizational changes (bonding and bridging social capital, e.g. functioning and dynamism of the FG, participators in research and disseminators of new technologies) and institutional changes (bridging and linking social capital, e.g. relations with research, extension and other groups and local government). For each of these, proper indicators can be elaborated with farmers; indicators can be of a structural form (meetings, decision-making structure) or of the cognitive type (capacity, group governance, effectiveness etc.)

4.8.2 Bonding type PME indicators for FRG functioning and dynamism

Meetings: What per cent of members attends, what is the number of meetings? Do participants engage in discussions? Do participants express their opinions/feelings and ideas?

Decision-making: Are decisions taken during the meetings? Is decision-making transparent? How is planning done: participatory/directive? Is financial management transparent?

Capacity: What is the capacity of the group to plan and execute its activities? Can the group explain its objectives? Can it make a program for its activities? Does it evaluate its activities in a structural way? Does it follow up the recommendations that are an outcome of the evaluation? Does it possess the tools for M&E of its activities? Does it realize its activities in a successful way?

Effectiveness: How effective is the group in increasing its knowledge and understanding? Has the group increased its technical knowledge? Has the group increased its knowledge on on-farm experimentation? Does every member of the group share in this knowledge?

Group governance: How sensitive is the group towards different interests of its members? Is there openness to discuss the interests of women and poorer farmers? Are intervention/trials proposed to take into account these interests? Do FRG members consider the effects of the proposed technologies on the position of women and poorer farmers?

Gender issues: Are gender issues considered? Do the group members discuss how men and women should be involved in a trial? Do the members discuss how men and women benefit from a certain technology? (Kingma et al. 1998).

4.8.3 PME indicators for reciprocal monitoring of the role of FGs in research and extension

Research partners:

- How many ideas that were brought up by FRGs appear on the research agenda?
- How many trials are modified based on comments from the farmers?
- How many trials are influenced by the outcomes of farmers' assessments?

Disseminators of new technologies:

- How many field days were organized?
- How many demonstrations were given?
- How many FRG farmers of other subgroups are adopting the technology? (Kingma et al. 1998).

References

- Alawy A and McCaslin NL. 1998. How can extension services to low-resource subsistence women's groups better relate to environmental conservation. Presented at the 1998 annual conference of the Association for International Agricultural and Extension Education, Tucson, Arizona, USA.
- Anandajayasekeram P, Martella DR and Rukuni M. 1996. *A training manual on R&D. Evaluation and impact assessment of investments in agricultural and natural resources research*. SACCAR (Southern African Centre for Cooperation in Agricultural Research and Training), Gaborone, Botswana.
- Andima DK, Makini FW, Okoko EN, Muyonga CK, Wanyama JM, Masinde A and Makworo S. 2002. Assessing the impact of the farmer participatory research approach in the development of soil management technologies in southwest Kenya. KARI, Kisii Regional Research Centre.
- Andreato S. 2000. Learning from the group: A case study of the Focus Farm Project in Gippsland, Victoria. Unpublished MSc thesis. University of Melbourne, Australia.
- Arbab F and Prager M. 1991. An approach to promoting tree growing in Africa: The world neighbors experience in northern Ghana. In: Haverkort B, van de Kamp J and Waters-Bayer A (eds), *Joining farmers' experiments: Experiences in participatory technology development*. Intermediate Technology Publications, London, UK. pp. 65-76.

- Asgelil D and Tekalign M. 2001. Client-oriented research and stakeholder participation in Vertisol technology development. In: Dubale P, Sertsu S, Astatke A, Kirub A and Tesfaye T (eds), *Vertisols management training manual*. EARO (Ethiopian Agricultural Research Organization), Addis Ababa, Ethiopia.
- ASSP (Agricultural Services Support Programme). 2004. Farmer empowerment programme component. ASSP Working Paper. Joint Government of Tanzania/Multidonor Formulation Mission. Revised Version, 12 March 2004. ASDP, a Working Group on Farmer Empowerment.
- Bebbington AJ and Riddell R. 1994. New agendas and old problems: Issues, options and challenges in direct funding of southern NGOs. Draft, mimeo. Overseas Development Institute, London, UK.
- Brooks I. 1999. *Organizational behavior. Individuals, groups and the organization*. Pearson Education Limited, UK.
- Cooper PJM and Denning GL. 1999. Scaling up the impact of agroforestry research. Report of the agroforestry dissemination workshop.
- CoratAfrica and INADES Formation Kenya (1987). *Management for development workers—Working with people*.
- Dave F and Dan Y. 1979. *Work groups: A practical manual for team building*. University Associates.
- Drinkwater M. (ed). 1994. Farmer participation and farmer research groups. An ARPT national workshop held at Kabwe, 1–6 February 1993. Workshop Commentary and papers, May 1994.
- Dube B. 1998. *Leadership training and resource manual*. Care International in Zimbabwe.
- Edouard J. 1998. Characteristics of demand and supply of agroforestry tree germplasm in Kenya. Unpublished thesis. Universite Laval, Quebec, Canada.
- Esman MJ and Uphoff N. 1984. *Local organizations—Intermediaries in rural development*. Cornell University Press, London, UK.
- Geran JM. 1996. Effect of group formation on rural women's access to services in Western province, Zambia. Sustainable Development Department and FAO (Food and Agriculture Organization of the United Nations), Rome, Italy. <http://www.fao.org/waicent/faoinfo/sustdev/PPdirect/PPre0010.htm>
- Gubbels P. 1997. Strengthening community capacity for sustainable agriculture. In: van Veldhuizen L, Waters-Bayer A, Ramirez R, Johnson DA and Thompson J (eds), *Farmers research in practice, lessons from the field. Ilea readings in sustainable agriculture*. Intermediate Technology Publications, London, UK.
- Heemskerk W and Wennink B. 2004. *Building social capital for agricultural innovation. Experiences with farmer groups in sub-Saharan Africa*. Bulletin 368. Development Policy and Practice, KIT, Amsterdam, the Netherlands.
- Heinrich GM. 1993. *Strengthening farmer participation through group dynamics. Experiences and lessons from Botswana*. ISNAR (International Services for National Agricultural Research), Botswana.
- IFAD/IFAP (International Fund for Agricultural Development/International Federation of Agricultural Producers). 1987. *Greater farmer participation in development projects and strengthening farmers' organizations*. Consolidated report of IFAD/IFAP workshops, 1987.
- Imbach AC, Fassbender HW, Borel R, Beer J and Bonnemann A. 1989. Modeling agroforestry systems of cacao (*Theobroma cacao*) with laurel (*Cordia alliodora*) and *Erythrina poeppigiana* in Costa Rica. Water balances, nutrient inputs and leaching. *Agroforestry Systems* 8:267–287.
- Kalonge S, Kaluba M and Lof HJ. 1995. Farmer participation in farming systems research: the case of Western Province, Zambia. In: *Design, implementation and analysis of on-farm trials. An assessment of field experiences, June 28–July 2 1993, Arusha, Tanzania. Workshop proceedings*. Royal Tropical Institute, Amsterdam, the Netherlands.
- Kelemework Fasil. 2003. *Progress on the implementation status of research–extension–farmer linkages strategy*. REF Linkage Department. EARO (Ethiopian Agricultural Research Organization), Addis Ababa, Ethiopia.
- KIT. 1997. *Shaping effective collaboration among stakeholders in regional agricultural research and development in sub-Saharan Africa*. Royal Tropical Institute, Amsterdam, the Netherlands.
- King RW. 1999. *Characteristics of successful people, businesses, and organizations. Personal and professional enhancement coaching*.
- Kingma K, Makundi PJ, Mafuru JM and Wella EB. 1998. *Monitoring and ongoing evaluation of farmer research groups: Tools used during 1995 and 1996 season*. Field Note 78. ZARDI Lake Zone, Tanzania.
- KIT. 1997. *Shaping effective collaboration among stakeholders in regional agricultural research and development in sub-Saharan Africa*. Royal Tropical Institute, Amsterdam, the Netherlands.
- KIT/World Bank. 2000. *Village participation in rural development. Tools and manual. The African network on participatory approaches*. World Bank, Washington, DC, USA, and Royal Tropical Institute (KIT), Amsterdam, the Netherlands.

- Maseko P, Scoones I and Wilson K. 1991. An approach to promoting tree growing in Africa: The world neighbors experience in northern Ghana. In: Haverkort B, van de Kamp J and Waters-Bayer A (eds), *Joining farmers' experiences in participatory technology development*. Intermediate Technology Publications, London, UK. pp. 49–54.
- Mavedzenge BZ, Murimbarimba F and Mudzivo C. 1999. *Experiences of farmer participation in soil fertility research in southern Zimbabwe*. Managing Africa's Soils 5.
- Mutia P. 1999. FARM-Africa, Meru Tharaka Nithi dairy goat and animal health care. Project Progress Report, January to June 1999.
- Nyakuni A. 2001. *ULAMP extension approach: A guide for field extension agents*. Relma, Regional Land Management Unit, Swedish International Development Cooperation Agency, Nairobi, Kenya.
- Parkins JR. 1997. Farm forestry networking: Farmer group development in Kenya. Unpublished dissertation, University of Alberta, Edmonton, Alberta, Canada.
- Phiri D, Franzel S, Mafongoya P, Jere I, Katanga R and Phiri S. 2004. Who is using the new technology? The association of wealth status and gender with the planting of improved tree fallows in Eastern Province, Zambia. *Agricultural Systems* 79(4):131–144.
- Piper WE. 1993. Research on group psychotherapy. In: Kaplan HI and Sadock BJ (eds), *Comprehensive group psychotherapy*. Williams & Wilkins, Baltimore, Maryland, USA.
- Place F, Swallow BM, Wangila J and Barrett CB. 2002. Lessons for natural resource management technology adoption and research. In: Barrett CB, Place F and Aboud AA (eds), *Natural resources management in African agriculture: Understanding and improving current practices*. CABI (Commonwealth Agricultural Bureau International) Publishing, London, UK.
- Pretty J. 2003. Social capital and connectedness: Issues and implications for agriculture, rural development and natural resource management in ACP countries. Review paper for CTA. CTA Working Document Number 8032.
- Pretty J and Ward H. 2001. Social capital and the environment. *World Development* 29:209–227.
- Pretty JN, Guijt I, Thomson J and Scoones. 1995. *Participatory learning and action; a trainers guide*. IIED (International Institute for Environment and Development), London, UK.
- Rausser T, Ebong G and Musiime J. 2001. More effective natural resource management through democratically elected, decentralized government structures in Uganda. *Development in Practice* 11(4):460–470.
- Reij C and Waters-Bayer A. 2001. *Farmer innovation in Africa: A source of inspiration for agricultural development*. Earthscan Publications Ltd., London, UK.
- Rhoades RE and RH Booth 1982. Farmer-back-to-farmer: A model for generating acceptable agricultural technology. Social Science Department, ICP (International Potato Center), Lima, Peru.
- Rivera WM, Zijp W and Alex G. 2000. *Contracting for extension: Review of emerging practices*. World Bank, Washington, DC, USA. <http://wbln0018.worldbank.org/essd/susint.nsf>
- Rondot P. 2004. Village farmer organizations and rural development in Burkina Faso. Report submitted by Arcand JL, CERDI, Université d'Auvergne, France. Synthesis by Rondot P. World Bank, Washington, DC, USA.
- Rouse J. 1996. Empowering Zambian rural women through small farmer groups. Sustainable Development Department of FAO. FAO (Food and Agriculture Organization of the United Nations), Rome, Italy. <http://www.fao.org/waicent/faoinfo/sustdev/PPdirect/PPan0005.htm>
- Sanginga PC, Lilja N and Tumwine J. 2001. *Assessing the quality of participation in farmers' research groups in the Highlands of Kabale, Uganda*. PRGA; CGIAR, Future Harvest. Working document/PRGA 19.
- Scarborough V, Killough S, Johnson DA and Farrington J. (eds). 1997. *Farmer-led extension: Concepts and practices*. Intermediate Technology Publications, London, UK.
- Show EM. 1976. *Group dynamics, the psychology of small group behaviour*. 2nd edition. Magraw Hill Book Company, Johannesburg, South Africa.
- Sigman VA. 1995. Increasing female household-head participation in agricultural extension in Malawi. In: Women and sustainable development in Africa. Praeger, Westport, Connecticut, USA. pp. 133–158.
- Sperling L. 1992. Farmer participation and the development of bean varieties in Rwanda. In: Mook JL and Rhoades R (eds), *Diversity, farmer knowledge, and sustainability*. Cornell University Press, Ithaca, USA.
- Stringfellow R, Coulter J, Lucey T, McKone C and Hussain A. 1997. *Improving the access of smallholders to agricultural services in sub-Saharan Africa: Farmer cooperation and the role of the donor community*. Natural Resource Perspectives 20. Overseas Development Institute, London, UK.
- Taylor B. 1989. *Assertiveness and the management of conflict*. OASIS Publications, UK.
- Uphoff NT with Esman MJ. 1974. *Local organization for rural development: Analysis of Asian experience*. Cornell

- Rural Development Committee monograph, Cornell University, USA.
- Wambugu F and Kiome R. 2001. *The benefits of biotechnology for small-scale banana farmers in Kenya*. ISAAA Brief 22. Ithaca, New York, USA.
- Wibberley EJ. 1997. The role of farmer groups and farmers' knowledge in optimising cereal growing systems. *Aspects of Applied Biology* 50:471–480.
- World Bank. 2000. *Decentralizing agricultural extension: Lessons and good practice*. World Bank, Washington, DC, USA.

5. Tools and approaches for participatory research and development

- 5.1 Introduction
- 5.2 Tool kits
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5.1 Introduction

The past two decades have seen an increased recognition of the importance of participation by beneficiaries and a wide range of other stakeholders in decision-making. This has led to the development of various participatory approaches, tools and methods. Experience has shown that participation improves the quality, effectiveness and sustainability of development actions. Various participatory techniques have been used in the planning, implementation and evaluation of projects. We have defined the concept of participation and the difference between 'participation' and 'participatory' in the first chapter. This chapter provides a brief description of the emerging participatory methods and outlines the various tools that are most commonly used.

There are arguments for and against the promotion of greater people's participation. These are summarized in Table 5.1.

A number of broad approaches for participation and a large number of participatory methods have emerged in the recent past. Table 5.2 lists the key participatory methods that are being introduced. The most commonly used approaches are Rapid Rural Appraisal (RRA), Participatory Rural Appraisal (PRA),

Participatory Learning and Action (PLA) and Participatory Assessment and Planning (PAP). The various tools used in these approaches are outlined in the next section.¹

Table 5.1. *Advantages and disadvantages of participation*

Advantages	Disadvantages
<ul style="list-style-type: none"> • Participants can improve the efficiency of activities by involving local resources and skills; they can make better use of expensive external inputs • Can enhance the effectiveness, as the activities are more relevant to local needs • Build local capacity and skills to manage and negotiate development activities • Can enhance the project coverage as local people are able to assume some of the burden of responsibility • Can lead to better targeting via identification of key stakeholders • Can help to secure sustainability of activities as beneficiaries assume ownership • Can meaningfully address gender considerations—providing opportunity to play a part in development work 	<ul style="list-style-type: none"> • Costs time and money, with no guaranteed impact upon the end product • Processes of participation are irrelevant and luxury in situation of poverty and will be hard to justify expenditure • Can be a destabilizing force in that it can upset the existing socio-political relationships • Is driven by ‘ideological fervour’ and less concerned with seeking to ensure direct benefits for people—promoting an ideological perspective into development • Participation can lead to shifting of the burden onto the poor

Table 5.2. *Participatory methods and their focus*

Method	Focus
Rapid Rural Appraisal (RRA)	Diagnosis and planning
Participatory Rural Appraisal (PRA)	Diagnosis and planning
Participatory Rural Appraisal and Planning (PRAP)	Diagnosis and planning
Participatory Assessment and Planning (PAP)	Diagnosis and planning
Participatory Learning and Action (PLA)	Diagnosis, planning and implementation
Participatory Impact Monitoring (PIM)	Monitoring and evaluation
Participatory Monitoring and Evaluation (PME)	
Participatory Farm Management Methods (PFM)	Planning in farm and household
Participatory Rural Communication Appraisal (PRCA)	Information and communication
Rapid Appraisal of Agricultural Knowledge Systems (RAAKS)	Information and knowledge systems
Participatory Technology Development (PTD)	Diagnosis, planning, implementation and evaluation
Participatory Livelihood Analysis	Livelihood
Participatory Poverty Appraisal	Poverty

Rapid Rural Appraisal (RRA) emerged in the late 1970s as a set of approaches and methods of inquiry about rural life and conditions to overcome the many defects of large questionnaire surveys. RRA is a systematic semi-structured survey by multidisciplinary teams designed to quickly acquire information on rural life (Conway 1998). It has the flexibility to adjust to situations because it does not require a standard set of methods to be applied in each case. The methods applied vary from situation to situation and are determined by local conditions, local problems and objectives at hand (Mukherjee

1. For a good account of comparison of the four methods, see Anandajayasekeram et al. (2002).

1997). RRA stressed and continues to stress cost-effective trade-offs between quantity, accuracy, relevance and timeliness of information. Methods and concerns include semi-structured interviewing and management of team interaction (Carruthers and Chambers 1981). In the 1980s, agro-ecosystem analysis (Conway 1986) contributed to another powerful stream of methods including sketch mapping, transects and diagramming.

Participatory Rural Appraisal (PRA) is a continuing outgrowth from RRA. PRA is described as a 'family of approaches and methods' (Chambers 1993, 1997) and evolved from the farming systems research (FSR) and RRA. It is a way of learning from, and with community members with a view to investigate, analyse and evaluate constraints and opportunities, and to make informed and timely decisions regarding development projects. PRA aims to fully involve farmers (both women and men) of the target group in the identification of their problems and to initiate their own solutions. PRA is not limited to agriculture or FSR alone but it is also frequently applied in general for community development projects. PRA methods reinforced some of the techniques used in RRA and added on new tools and above all emphasized broader community participation. The proponents of PRA argued that RRA is extractive with outsiders appropriating and processing the information whereas PRA is participatory with ownership and analysis done mostly by rural people themselves. With PRA it is less outsiders and more local people who map model, diagram, rank, score, observe, interview, analyse and plan. The key innovations of RRA are methods such as semi-structured interview, methods for team interaction, sketch mapping, decision trees and causal diagramming. The key innovations in PRA have been behavioural. Both RRA and PRA rejected conventional professional norms and behaviour and developed and shared new methods.² One of the most promising developments has been visual sharing and analysis through diagrams.

In the early 1990s, the frontier continued to move. There was renewed attention to questions of whose knowledge counts—that of scientists or that of farmers? Knowledge and priorities vary—both within communities and differing for individuals, groups and gender, and between rural people and outside professionals. The interaction between outside professionals and rural people has become a focus. Some of the most recent versions of participatory methods for diagnosis and community planning are 'Participatory Learning and Action' (Wetmore and Theron 1998), and 'Participatory Assessment and Planning' (Farm 1998). These are community management tools that facilitate broader stakeholder participation and community planning in an interactive way. These approaches help the community to make its own development plan based on the community needs and to prepare a program of action to translate the plan into reality.

5.2 Tool kits

A large number of tools and techniques are currently being used in various participatory approaches to research and development (R&D). A summary of tools is presented in Box 5.1.

Secondary data review

Also called desk review, this is an inexpensive, initial inquiry that provides necessary contextual background. Sources include academic theses and dissertations, annual reports, archival materials, census data, life histories, maps, project documents and so on.

2. For a detailed discussion of methods in development, see Anandajayasekeram and Dixon (1998).

Box 5.1. Tools and techniques used in PRA

- Review of secondary data
- Direct observation—measurement
- Semi-structured interview
- Key informant interview
- Focus groups discussions
- Ranking
 - Preference ranking
 - Pair wise ranking
 - Direct matrix ranking
 - Ranking by voting
 - Wealth ranking
- Mappings and diagrams
 - Village mapping
 - Resource mapping
 - Social mapping
 - Transect walk
 - Flow diagrams
 - Pie charts, histograms
 - Venn diagrams
 - Systems diagrams
 - Innovation tree
- Trends
 - Time trends
 - Historical profile
 - Livelihood analysis
- Gender Analysis

5.2.1 Semi-structured interview

These are also called *conversational interviews*, interviews that are partially structured by a flexible interview guide with a limited number of preset questions. This kind of guide ensures that the interview remains focused on the development issue at hand while allowing enough conversation so that participants can introduce and discuss topics that are relevant to them. These tools are a deliberate departure from survey-type interviews with lengthy, predetermined questionnaires.

Using a guide or a checklist, a multidisciplinary team poses open-ended questions and probes topics as they arise. The output is usually in the form of qualitative information, but can also be quantitative. The steps to follow in a semi-structured interview are summarized in Box 5.2.

There can be sequencing and a chain of semi-structured interviews, which can be repeated as and when required. Semi-structured interviews can be conducted with different groups in a village or community. For a detailed discussion the reader is referred to the FSA sourcebook.

Box 5.2. Semi-structured interview—steps to follow

Before survey

- Select the multidisciplinary survey team;
- Analyse secondary data;
- Prepare checklist for the interview (this should be a team exercise);
- Prepare the logistical side of the survey;
- Inform farmers in advance;
- Establish note taking procedure before entering the village; and
- Decide whether group discussion and/or individual in-depth interviews are more appropriate.

During a group meeting or individual interview

- Be aware of the local culture and language;
- Respect farmers as equal partners;
- Do not use checklist as a questionnaire—use it as a means to stimulate discussion;
- Build questions to be asked around a list of subtopics;
- Use guidelines for probing: who? why? what? when? where and how?;
- Take notes during the interview but not excessively.

After the interview

- Finish the discussion politely;
- At the end of the day have a brainstorming session, complete notes and prepare for the following day's work;
- Establish report writing procedures as well as responsibilities among team members.

5.2.2 Key informant survey

In key informant surveys, individuals knowledgeable about certain subjects or topics are asked to provide information. The key informant survey differs from a regular survey in that the person interviewed does not answer questions about himself/herself but about the subject in which (s)he is an expert or has a very good knowledge. A knowledgeable farmer, for example, describes the farming practices followed by the farmers in his/her area but does not describe his/her own farm. If they are carefully carried out, key informant surveys can provide a large amount of high quality, quantifiable information quickly and at low cost. Only a few individuals at any given site need be interviewed.

The quality of the data can be verified by interviewing two key informants about the same subject. The answers of the two informants can be compared. In most cases all the answers should be fairly close. In those cases where differences in answers occur, people can be questioned again to get the right information. If during a key informant interview, it becomes obvious that the selected person is not knowledgeable enough to answer the questions, the interview can be terminated tactfully and another more knowledgeable individual may be selected as a key informant.

Depending on the nature of the information needed, one could interview any of the following persons: experienced farmers, shopkeepers and merchants, the local extension agent, local village administrators, teachers, mid-wives, farmers who hold position of traditional leadership, input suppliers, or the leader of a farmer group or association.

5.2.3 Formal/verification survey

Although informal surveys can provide a lot of information in a relatively short period, there may be a further need for more specific information and quantitative data. Under these circumstances, a follow-up formal survey may be appropriate. A survey uses a sequence of focused, predetermined questions in a fixed order, often with predetermined, limited options for responses. Surveys can add value when they are used to identify development problems or objectives, narrow the focus or clarify the objectives of a project or policy, plan strategies for implementation, and monitor or evaluate participation. It is important to keep in mind that this formal/verification survey is different from the traditional farm management survey. The distinguishing characteristics of a formal survey are:

- Uses standardized or structured questionnaire;
- Collects uniform set of data;
- Engages, as much as possible, a sample of farmers to collect information;
- Enumerators are often used to administer the survey; and
- Carries out problem-focused verification.

Since the survey collects standard information from a sample of farmers, it enables statistical analysis of information collected. Formal surveys are recommended in one of the following cases:

- When quantitative data are required to complement qualitative data obtained from RRAs/PRAs;
- When detailed information on individuals or households is sought rather than general information on target group;
- To compare before/after situations and the changes in farmers' conditions over time (baseline and adoption studies);
- To conduct in-depth studies of specific subjects and to test hypotheses that have emanated from informal surveys.

5.2.4 Community interview

At times, in community development oriented activities, one useful tool is conducting what is known as a community interview. The objectives of this type of interview are:

- To gather descriptive data on community and village;
- To assess community needs/problems and priorities; and
- To assess the attitude/commitment of the community with respect to planned intervention.

The advantages of community interviews are:

- It permits interaction with large group of people within a short period of time, i.e. it is efficient in terms of cost and time;
- In a non-threatening environment, participants tend to complement/correct/verify each others' input, thus improving the quality of the information collected.

As in the case of group interview techniques, there are a number of limitations to this approach. They include:

- The local leaders and powerful community members may dominate the deliberations;
- The group may not be homogenous; and
- The facilitator should have considerable practical knowledge about the problem/issue that needs to be explored.

5.2.5 Focus group interview/discussion

Focus group interview is another form of group interview that addresses specific topics/issues confronting a group. Typically 6–8 people under the minimum guidance of a facilitator discuss a particular topic in detail. When the ideas and opinions of people at the grass-root level are needed about a specific problem or intervention, then a focus group interview is the most appropriate technique to use. This type of discussion may reveal the perspective, attitude, understanding and reactions of beneficiaries/local group.

The group interview is cost effective, can be carried out quickly, and can obtain a wide range of information. The moderator of this exercise should not be biased, must possess good theoretical and practical knowledge of the problem/issue being discussed. (S)he should be fluent in the local language and should have previous experience in conducting focus group sessions.

The potential dangers are that the formal/informal leaders and influential individuals may dominate the discussions. If the issue under discussion is controversial and sensitive, then the group situation may inhibit rather than stimulate individuals' response. Focus groups are not intended to reach consensus, make decisions or agree on specific action.

5.2.6 Ranking

Ranking, or scoring, means placing something in order. Specific methods include preference ranking, pair wise ranking, direct matrix ranking and wealth ranking among others. This section discusses the wealth ranking technique in detail.

Wealth ranking

Wealth ranking is a tool for identifying and ranking the relative wealth status of a group of farmers. This is based on the assumptions that there are inequalities and differences in wealth in every community and these differences influence or determine people's behaviour and coping strategies including adoption of technologies.

This is also known as wellbeing ranking or vulnerability analysis, and is a technique for the rapid collection and analysis of specific data on social stratification at the community level. This visual tool minimizes literacy and language differences of participants as they consider factors such as ownership of or use rights to productive assets, lifecycle stage of members of the productive unit, relationship of the productive unit to locally powerful people, availability of labour and indebtedness.

Wealth ranking allows the team to investigate perception of wealth differences and inequalities in a community; discover local indicators and criteria of wealth and wellbeing and; establish the relative position of households in a community. It is based on the assumption that community members have a good sense of who among them is more or less well off. There is a need to maintain confidentiality, not to cause bad feelings within community. This is often done by involving key informants by a facilitator.

Steps in wealth ranking:

1. Choose the community for wealth ranking;
2. Define the unit of ranking (normally household);

3. Define and understand the local concept of wealth;
4. Identify criteria and indicators for wealth ranking;
5. Make a list of all households—assign numbers;
6. Identify at least three key informants;
7. Ask key informants to sort cards independently, using their own criteria—use baskets or boxes;
8. Establish criteria used and differences between piles;
9. Record information, establish scores for each household
 - All farmers in one pile will get the same number
 - Note: Rich households will have the lowest score
10. Add scores and divide by the number of key informants;
11. Arrange households according to wealth categories.

If informants used different number of piles, take the average. It is worth noting that this system does not work well in heavily populated areas and scores between villagers cannot be compared.

5.2.7 Diagrams

A diagram is any simple schematic device which presents information in a condensed and readily understandable form. It is a simplified model of reality. The value/usefulness of diagrams lies in that:

- They greatly simplify complex information;
- The act of constructing a diagram is an analytical procedure; and
- This is an excellent way of involving community members.

The diagrams that are commonly used are summarized in Box 5.3.

Box 5.3. Commonly used diagrams

<i>Dimension</i>	<i>Diagram</i>
Space	Maps, transects
Time	Seasonal calendar, daily routine chart, daily activity calendar, time trends, historical profiles
Relation	Flow diagram, livelihoods analysis
Decision	Decision tree, Venn diagram, innovation tree
Constraints	Problem tree

5.2.8 Maps

Mapping is a generic term for gathering baseline data in pictorial form on a variety of indicators. This is an excellent starting point for participatory work because it gets people involved in creating a visual output that can be used immediately to bridge verbal communication gaps and to generate lively discussion. Maps are useful as verification of secondary source information, as training and awareness-raising tools, for comparison, and for monitoring of change.

The different types of maps drawn include village map, village social map, village resource map, mobility maps and transect map. Maps show the geographical arrangement of key features of an area including individual fields, farms, villages/communities/districts, physical infrastructure, social infrastructure, cropping system, water sources, woodlands, major physical features, land tenure system and, grazing areas depending on the purpose of the map.

The procedure for participatory mapping includes the following steps:

1. Decide on what sort of map needs to be drawn;
2. Find people who know the area and understand the process of the mapping exercise and are willing to share their knowledge;
3. Choose a suitable place (ground, floor, paper) and medium (stick, stones, pins, pencils) for the map;
4. Explain clearly and carefully the purpose of the map;
5. Help people get started but let them draw the map by themselves; be patient, do not interrupt;
6. Keep a permanent record of the map, including the names of the mappers; do give them due credit.

While mapping, a few points need your attention.

- Participants might need to be separated into different groups in order to obtain unbiased view of the subject. Ideally, the group size should not exceed 15 members.
- As mapping takes time, choose a comfortable location which is reasonably free from distraction.
- Use local material as much as possible (sticks, stones etc), but also take material like coloured chalk to use on cement floors or coloured pens to be used on paper.

Mobility maps

Mobility maps provide an indication of contacts with the outside world. Contacts and decision-making power in a community are assumed to be closely linked. Spatial mobility can be used as a person's contact with, and knowledge of, the outside world and his/her authority in the community. Mobility map is both a data collection and an analytical tool.

Steps to creating mobility maps:

1. Define the mobility map, and clearly introduce its purpose;
2. Organize different groups (by sex, marital status, job etc);
3. Every participant completes a mobility map individually for a certain period (week, month, year);
4. Results are compared and 'representative' mobility maps are drawn for each subgroup;
5. One person from each subgroup presents the mobility map to the larger group; and
6. All participants discuss the results of the mapping exercise.
 - When using flip charts and markers, use different colours for different activities, work, health, visiting, shopping, education.
 - Show differences in the frequency of mobility by making the lines thicker and thinner.

Transect

A transect is a diagram of main land use zones in a community or a village. It compares the main features, resources, uses and problems of different zones. Transect maps are particularly useful when there is a range of land use systems in one community.

A transect walk is a simple technique used to build transect maps. This ensures that the team fully explores the spatial differences in the area under study. This might be a region, catchment, village or field. The team walks through to the periphery, observing trees, livestock, availability of water and so on. The transect diagram produced is a stylized representation of a single or several walks by the team. The importance of a transect lies not only in knowing the agro-ecological zones in rural areas, but also in getting an in-depth account from the participating villagers from such zones in the village, their uses,

problems and opportunities. A transect walk can be supplemented by other walks so as to enable the outsiders to learn more about any village and clarify doubts.

Steps in doing a transect:

1. Identify community members who are knowledgeable and willing to participate in a walk through their village and surrounding areas;
2. Discuss the different aspects to be indicated in a transect map (crops, land use, trees, soils) and which route to take;
3. Walk the transect;
4. Observe, ask questions and listen;
5. Discuss problems and opportunities;
6. Identify the main natural and agricultural zones and sketch distinguishing features including soils, crops, livestock and problems/solutions/opportunities;
7. Draw the transect map;
8. Crosscheck the transect map with key informants.

While doing a transect walk and the map, a few points need your attention:

- The route must be planned with the villagers;
- The route should pass through the main land use system;
- Stop when interesting issues arise that are important;
- Divide responsibilities among team members' crops, land tenure, soil types etc.;
- Prepare the diagram as soon as the walk is completed;
- Probe on the farming system, severity of the constraints and degree of consensus amongst villagers.

5.2.9 Trends/calendars

Calendars are diagrams showing the timing and/or importance of events over a period of time—be it a year, production season or a day. Some commonly used calendars are:

- Seasonal calendar—main activities during seasons and off-season;
- Rainfall patterns—annual rainfall distribution;
- Crops/livestock, different practices—enterprise calendar;
- Labour calendar;
- Water sources for livestock during the year or season;
- Labour migration;
- Prices of products—seasonal;
- Daily activity clock for men and women, winter and summer, cropping season and off-season etc.

Seasonal calendars are drawn to foster understanding of the local livelihood system. They show the major changes that affect a household, community, or region within a year, such as those associated with climate, crops, pest and diseases, water use, labour availability and demand, livestock fodder, prices, income, debt, migration, health, diseases and so on. Such diagrams highlight the times of constraints and opportunity, which can be critical information for planning and implementation.

Time trends

Time trends show quantitative changes over time of the same variable. It can be used for many variables like yields, cultivated area, livestock population, prices, migration, population size and number of households, birth and death rates and malnutrition rates.

A time trend is different from a historical profile or a timeline in that a time trend is more precise in giving indication of change (increase or decrease) about a particular item whereas historical transects or timelines show broad movements of different aspects of village life rather than their precise shifts.

Historical profile/timeline

A historical profile provides a summary of key historical events in a community and their importance in the present situation. It reveals important information that aids better understanding of the current situation in the community. This profile can be done with a group of elderly villagers, knowledgeable about their village, by asking them to provide a historical account of village conditions or with different tribal/cultural/economic groups. It can be done separately with males and females to bring out differences in perspective. The profile helps to be informed about major events and changes in conditions that have taken place in the past, e.g. changes in cropping patterns, changes in vegetation, traces of environmental degradation, infrastructural changes etc.

5.2.10 Flow diagrams

Flow diagrams show causes, effects and relationships between key variables. There are many variations of flow diagrams. The most commonly used is a problem causal diagram, which is very useful in problem analysis.

Steps in building problem causal diagram:

1. Identify the problems to be analysed;
2. Consider one problem at a time;
3. Put the problem at the centre and circle it;
4. Explore the causes of this problem;
5. Write each cause on a separate card;
6. Discuss and probe until no more causes can be identified;
7. Place causes cards in correct relationship to the problem; and
8. Draw arrows to show the causal-effect relationship.

Livelihood analysis

Livelihood analysis diagrams are used to help interpret the behaviours, decisions, coping strategies of households with different socioeconomic characteristics. The variables used include household size and composition; livestock and ownership; number of labour migrants in the household; proportion of income by source: crops; livestock; trade and craft; remittances; expenditure by item; seasonality of income generation potential; relative income; and credit and debt.

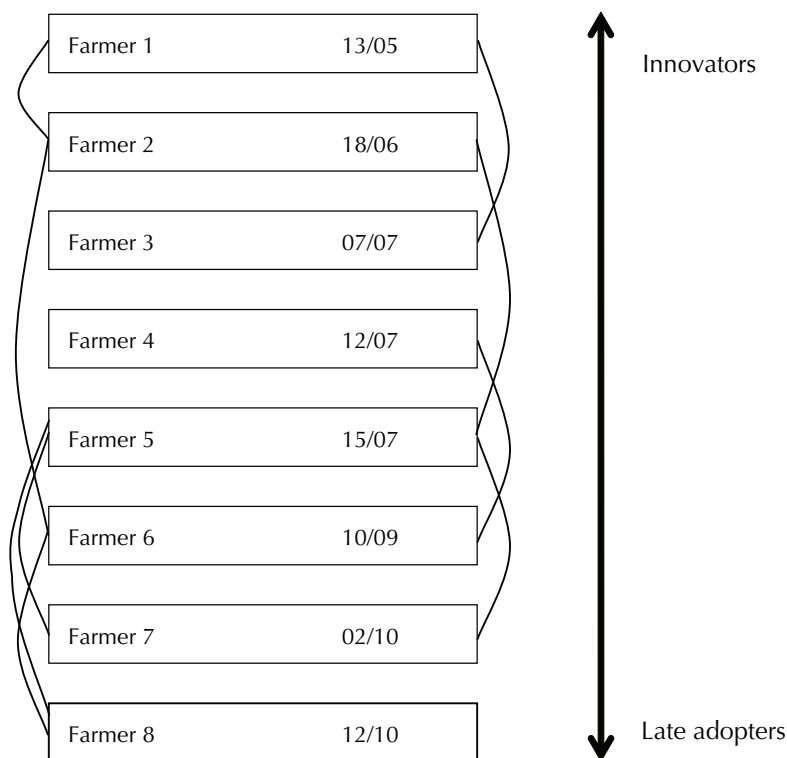
Steps involved in creating livelihood analysis diagrams

1. Clarify local definition of household;
2. Choose variables to be recorded;
3. Choose basic socioeconomic stratification such as size of the household, amount of land owned, main source of income etc.;
4. Devise data collection table;
5. Obtain data;
6. Interview several community members;
7. Cross-check information; and
8. Prepare livelihood analysis diagrams.

When this exercise is completed then the innovators should be at one end, while late adopters at the other. One could use the floor for this purpose.

4. The person or household who first made the innovation is asked to take the floor and explain who or what inspired to do this. One facilitator can guide the process, while another records all the comments.
5. In a chronological order all the others were asked to indicate who inspired them to adopt the idea of innovation. Lines can be drawn between farmers. The facilitator tries to find out what exactly convinced them to do it, and what other than personal factors were involved in the decision-making process. An example of an Innovation Tree transferred to paper is presented in Figure 5.1.
6. Facilitate group discussion and stimulate reflections to identify the technical, economic, social and psychological dimensions contributed to the adoption of the technology. During the process, the facilitator should try to draw on the insights gained from the exercise and explore who could contribute in which way to scaling-up the innovation adoption process, i.e. farmer-to-farmer extension. In selecting extension workers the important criteria are not only the technical but also facilitation skills.

Note that farmer decision-making in adopting a technology is influenced by institutional, economic, cultural, social and psychological characteristics. The social and psychological factors enhancing or inhibiting the actual adoption can be analysed directly with community through the innovation tree. Mele and Zakaria (2002) identified a list of social and psychological factors that could influence the adoption process (both positively and negatively) (see Table 5.3).



Source: Mele and Zakaria (2002).

Figure 5.1. Example of an innovation tree.

It is worth noting that this is an emerging tool and is useful to distinguish between different types of innovators and if properly executed will help us to understand the psychological and social dimensions underpinning the decision-making process—something that is difficult to determine in other ways.

This may also yield valuable information about which people or more broadly personalities (and even institutions) must be engaged in a particular scaling-up activity, i.e. farmer-to-farmer extension. However, in order to gain a better understanding of the adoption process, this tool need to be complemented with other tools such as semi-structured interview, personal observation, adoption survey etc.

Table 5.3. *Some social and psychological characteristics influencing adoption*

Social factors		Psychological factors	
Stimulating adoption	Inhibiting adoption	Stimulating adoption	Inhibiting adoption
<ul style="list-style-type: none"> • Personal communication network • Social participation • External pressure • Common need for solving a problem 	<ul style="list-style-type: none"> • Opposition in the farming community • Social isolation • Poverty 	<ul style="list-style-type: none"> • Innovation proneness • Risk taking ability • Extrovert • Overall knowledge • Self fulfillment • Pride of ownership • Level of aspiration 	<ul style="list-style-type: none"> • Complexity of technology • Risk avoidance • High level of stress • Lack of knowledge on the technology • Lack of motivation • Mistrust of project staff

Source: Mele and Zakaria (2002).

5.3 Gender analysis

Early work on participatory methods revealed that women's views and activities are as important as men's and as relevant to the design and implementation of improved technologies. Gender considerations for technology development and transfer focus on such issues as: the difference in socioeconomic perceptions and expectations on the status, roles and achievements of men and women as well as the differential impact of development and change on men and women.

The objectives of gender analysis are:

- To identify major gender differentials of target group;
- To identify gender specific problems, constraints and opportunities;
- To develop strategies that will enhance women's and men's participation in activities and sharing of benefits;
- To foresee effects of interventions on women and men of the target group.

Gender analysis focuses on four sets of questions.

- Who does what, when and where?
- Who makes what types of decisions?
- Who has access to or control over resources for production?
- Who benefits from each enterprise? What are the incentives and disincentives for production? For making changes?

The question of who benefits is closely related to roles and responsibilities as well as control of resources. Learning about gender requires special research methods and approaches. It might be useful to involve both male and female research and extension staff. Some tools that are employed for gender analysis are described below. The tools discussed in this section are not totally exhaustive; only the most commonly used tools and techniques are outlined here.

5.3.1 Activity profile

This addresses the question—who does what? This profile could either be general (listing of general activities according to gender) or specific, i.e. related to livestock or crops. The profiles assist in identifying activities carried out by women, men, boys and girls; location and time spent in carrying out the activities; ascertaining that research and extension objectives are within the needs and roles of women and men in the target area, and that planning within the target group is based on their calendar.

Procedure

- Divide the group by male and female—possibly by age group;
- Explain the purpose of this tool and exercise;
- Identify various farming activities according to enterprises and other community related activities;
- Ask who is involved in these activities;
- Group according to women, men, both, youth etc.;
- Present results in a plenary session to get community consensus.

Key questions to ask include:

- Who does what?
- How much time is spent on specific activities by women, men, boys and girls?
- What is the total workload per gender?

The second issue to be addressed is who makes what decisions. As the household level various decisions are made with respect to on-farm activities, off-farm activities, allocation of household resources, use of income etc. it is important to gain an understanding of this process.

5.3.2 Access and control profile

Access and control profile is related to asset control and realization of benefits. This tool is used to specify access to and control over the resources and benefits by gender. The objective is to identify resources women and men require for their work and benefits they gain; identify who has access to or control over these resources and benefits; analyse the implications of men and women participating in the interventions; find solutions to address barriers related to access and control over resources and benefits. The access and control profile, like the activity profiles could be general or sectoral.

Procedure

1. Group farmers by gender;
2. Explain the purpose of the tool and the exercise;
3. Prepare a sheet for recording information;
4. Ask participants to identify the major types of resources and assets;
5. Ask who has access and who controls these resources and assets;
6. Ask what the sources of benefits are, who receives it and uses it—if possible establish purpose.

Key questions on resources

- What resources do men and women require for their work?
- Who has access and control over these resources?
- How will access to and control over the resources affect men's and women's participation in interventions?

Key questions on benefits

- What benefits do women and men obtain from their work?
- Are the benefits commensurate with their work?
- Who controls these benefits?
- How will access and control of benefits affect men's and women's participation in interventions?

At the end of this exercise, the group should be able to complete the table (Table 5.4).

Table 5.4. *Format to elicit control and access profiles*

Resource/assets	Who has access?	Who controls?	Benefits		
			Source of benefit	Who receives?	How used by whom?
Land					
Livestock					
Farm implements					
....					
....					

5.3.3 Influencing factors profile

The aim of using this tool is to identify various determinants on division of labour, access and control of resources and benefits; identify constraints or opportunities that may impact women's and men's equal participation and the sharing of benefits; develop strategies to address factors which may constrain achieving of intervention objectives. This is used to identify the factors (legal, economic, cultural or environmental) affecting the existing gender situation.

Following either the activity profile or the access and control profile discuss with farmers the influencing factors of the situation activity profile.

5.4 Stakeholder analysis

Stakeholder analysis responds to the question: which and whose interests matter in agricultural R&D intervention? It sets the domain of people, groups and organizations that should be taken into account when planning intervention by examining their interest and potential impact on them. The basic output is the identification and description of actors that an intervention is explicitly designed to help, as well as those whose involvement is required to make the intervention work. The identification process disaggregates these actors into different characteristics, including:

- Structural: gender, age, geography (location or rural/urban), occupation
- Economic: employment sector, firms or business associations
- Political
- Social

Stakeholder analysis is the identification of a project's key stakeholders, an assessment of their interest, and the ways in which these interests affect project riskiness and viability. It is a technique you can use to identify and assess the importance of key people, groups of people, or organizations that may significantly influence the success of your activity or project. It is linked to both institutional appraisal and social analysis: drawing on the information deriving from these approaches, but also contributing to the combining of such data in a single framework. Stakeholder analysis helps to define whom to try

to involve in designing a multi-stakeholder process and in which way, and it allows to find out whose information needs must be considered. The approach is conducted in the early stages of planning. Accordingly, stakeholder analysis assesses:

- Organizational capability to influence, lobby or mobilize large numbers of people;
- The degree to which expected intervention is manifested by political or social action.

In terms of the capacity of organized interests to derail or distort an intervention, stakeholder analysis underlies any assessment of the organizational ownership, which addresses the organization's willingness to undertake and stick with the intervention over time. The basic output of ownership assessment is an estimate of the location and extent of pressure that the organization/institution will experience in adopting any form of intervention. An ownership assessment grid can be used to estimate and compare not only how interventions affect stakeholders, but also how stakeholders are likely to affect the organization's commitment to sustaining the intervention.

However, while secondary literature is an important resource, stakeholder analysis *cannot be carried out without key informant interviews* that identify specific stakeholders relevant to the sustainability of the intervention. While some important information may be quantifiable, other information is inherently more subjective. Accordingly, the reliability of findings—especially on ownership assessment—depends on direct interaction with diverse stakeholders. Limiting interviews to a narrow group, such as government officials or big business, can generate a highly distorted picture of interests, intentions and influence.³

For stakeholder analysis, stakeholder analysis matrixes and ownership assessment grids can be used.

5.4.1 Stakeholder Analysis Matrix (SAM)

Stakeholder analysis also describes the stated or unstated interests of actors *vis-à-vis* the intervention as well as the degree of their influence or organizational ability to mobilize behind a common purpose. The SAM matrix summarizes this information succinctly.

5.4.2 Ownership assessment grid

A useful shortcut for presenting information about ownership is to plot relevant stakeholder groups on a grid. This can be done with economic interest, social groups or both, depending on the country. The points graphically represent the balance of forces for or against the intervention. Note that the organization itself does not appear on the diagram. Rather, its commitment to the intervention is derived from the positions and influence of public and private groups including implementing agencies that have a stake in the intervention. It is advisable to validate and cross-check the findings of ownership analysis among representatives from relevant stakeholder groups.

A clustering of points near the top-right should set off warning flags about moving ahead quickly. In the same vein, an even distribution at the top may suggest strategies to encourage coalitions among supporters—especially when arrayed against blatant rent seekers—or to find compensation mechanisms for adversely affected groups. Groups that appear in the bottom right may indicate the need for safety nets or other coping mechanisms, or special efforts to encourage participation.

3. For a detailed description of stakeholder analysis questions and techniques, see Bianchi and Kossoudji (2001).

Table 5.5. *Format for the Stakeholder Analysis Matrix (SAM)*

Stakeholder categories	Relevant stakeholders	1. Characteristics (social, location, size, organizational capability)	2. Interests in relation to intervention (effects on/effects of policy)	3. Influence on outcome (H = High, M = Medium, L = Low)
Government policymakers				
Implementing agency staff				
Intended beneficiaries				
Adversely affected persons				
Organized interest groups (e.g. business associations, trade unions)				
Civil society (e.g. NGOs, CBOs, religious organizations)				
Donors				
Other external/internal stakeholders				

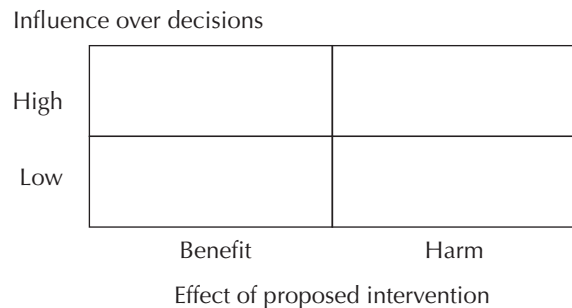


Figure 5.2. *Ownership assessment grid.*

Opportunities and limitations

At a minimum, stakeholder analysis provides an opportunity to avoid major mistakes up front. If it reveals ownership to be extremely weak, stakeholder analysis can lead to a fundamental re-evaluation of an intervention, regardless of expected positive impacts. More positively, stakeholder analysis can suggest strategies for overcoming opposition. The juxtaposition of low influence beneficiaries with high influence losers (or rent-seekers) is all too common, and is sure to put the intervention in a tough spot.⁴ When powerful opposition is identified, further analysis may be required to determine what kind of strategy to follow.

The major strengths of stakeholder analysis are:

- The methodology recognizes the fact that obstacles to sustainable growth cannot be dealt with through technological means alone rather conflicting interests must be addressed;

4. The logic of collective action suggests that interests will exert more pressure on policymakers or elected leaders when: (1) the number of group members is small; (2) the benefits or rents that accrue to each member are easy to perceive; and (3) the benefits or rents that accrue to each member are significant for each member.

- It has the advantage of being a flexible, context-specific paradigm that helps focus attention on specific problems, actors and opportunities for change.

An important limitation of stakeholder analysis is interpreting data that is largely subjective and context specific. The determination of 'sufficient' ownership cannot be calculated by simply 'adding up' opposition and support groups like force vectors in physics. Strong support from one group does not necessarily neutralize (or even reduce the effect of) strong opposition from another. The interaction between stakeholder characteristics and the intervention action can be subtle. In addition to resources such as money or membership size, groups can influence organizations through social or cultural affinity (e.g. race, language), role in economic growth (, e.g. exports, allocation of credit), or perceived trustworthiness (e.g. eloquence, degree of education, attire).

Furthermore, stakeholder analysis tends to be used at the beginning of a cycle or program. The technique then serves as a strategic entry point for the development of a critical methodology that supports the process throughout its entire duration. Eventually, however, stakeholders and their interests and views may evolve, new actors may appear on the scene, or central issues and stakes may shift over time.

5.5 Actor analysis

In undertaking any intervention, the first step is to identify the key actors who bring about or prevent change in an innovation system, i.e. identifying the actors who are the actual drivers or hindrance to change. The breadth of analysis may vary depending on the context and focus. The emphasis is on identifying specific social groups or actors in a specific location at a given point in time. In actor analysis it is the people who make decisions which define the groups. For example 'research' does not happen; it is the people who do research, so the category would be 'researchers'. The common tools used to analyse actor linkages are: actor linkages map, actor linkage matrix (ALM), actor determinant diagrams, actor time line, and actor learning and response analysis. These tools are briefly discussed in the following sections.

5.5.1 Actor linkage map

This is a useful starting point for discussing relationships and flows of information in an innovation system. The key actors are shown on a map with arrows between them indicating flows of information. In an actor linkage analysis there is always an arm going in each direction. Note that single two-headed arrows are never used, as one of the main points of the mapping is to examine power relationships in the control of flows of information on different directions. The intensity of these flows can be illustrated by the width of the arrows (see Figure 5.3 for illustration). It is important to make sure that these maps represent actual flows of information. The map will be used as a guide to discussions of formal and informal mechanisms used to transmit and control information.

The actor linkage maps could be done individually with each of the actors. We could do what are called 'ego based maps': here we look at individual actors and see who they link up with. All the ego-based maps can be synthesized to come up with the innovation system map.

For an ego-based map, we place the actor we are talking to in the centre and ask them to identify key actors they have linkages with and draw them up. We could ask them to distinguish whether the linkages in their perception are strong or weak (use strong, weak and dotted lines to represent them). We could even use different maps for past, current and anticipated situations, where relevant. This would help us understand the changes and the dynamics in the system.

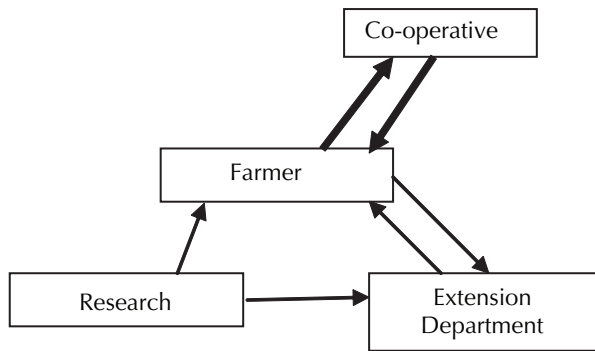


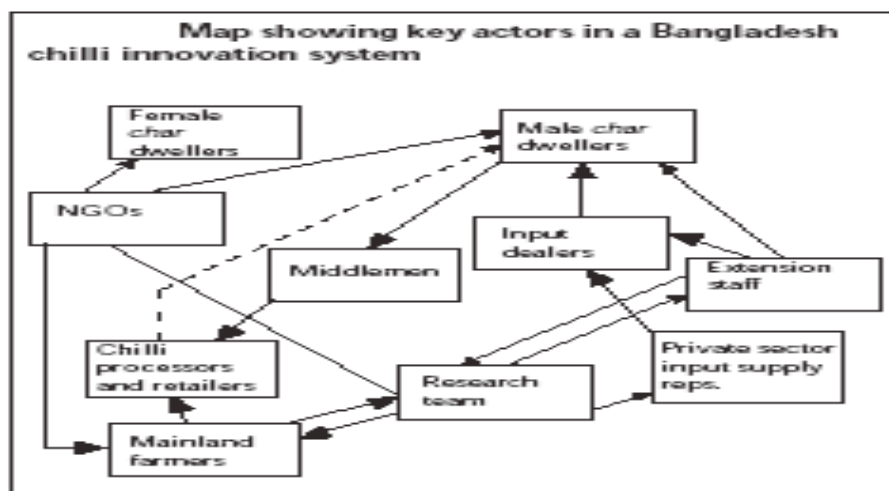
Figure 5.3. An actor linkage map indicating flow of information.

Creating an ego-based linkage map

Maps can be drawn up by one actor or in a group.

- Put the name of the actor we are talking to in the centre of the page
- Ask the actor who they link with for different aspects of their enterprise
- Use arrows to show the direction of flow of information or services
- Use thick or thin arrows to indicate the importance of the link.

Actor linkage maps are particularly useful when focusing on one actor and his/her linkages with other groups. As the number of actors increases, however, the map can become too complicated. At this point it may be useful to work with maps of part of the system or move to an actor linkage matrix (Figure 5.4).



Source: Biggs and Matsuert (2004).

Figure 5.4. An example of an actor linkage map from Bangladesh.

5.5.2 Actor Linkage Matrix (ALM)

ALM identifies all the actors and shows the links between major actors in an innovation system. It complements the actor linkage map. In a matrix this is represented by listing actors along the vertical and horizontal axes. The cells in the matrix represent flows of information from the actors in the rows to actors in the columns. In the matrix all cells can be identified by their co-coordinators (numbers for rows and letters for columns are shown in Figure 5.5).

	CBO's	NGOs	Private seed cos	Donors	Farmers
NARO	→Seed →Train farmers	→Seed for dissemination ←Feedback	→Breeder seed ←Provide feedback	←Funds	→Training farmers →Seed ←Feedback
CBO's (Organized seed group)		→Sell seed			→Sell seed
NGOs			←Sell seed	←Funds	→Seed →Train farmers ←Sell seed
Private seed companies				←Funds	→Sell seed
Donors					

Figure 5.5. An illustration of an Actor Linkage Matrix.

The matrix basically plots the same information as the map, but has additional advantages such as:

- It can deal with more complex situations and more actors (maps tend to get very messy).
- It has a cell for every possible linkage, and so encourages one to explore all possibilities.
- It plays a useful role in helping to pinpoint particularly significant links, e.g. strong links, coalition groups, weak links etc. This makes it more useful than the map for planning, implementation, monitoring and evaluating change.
- It enables users to quantify the strength of linkages using symbols in each cell, e.g. pluses and minuses, or codes such as s (strong), m (medium), w (weak), dn (do not know).
- It enables users to condense and store a lot of information about linkages in the spreadsheet ALM (each cell reference can be linked to a text). Therefore, it is a useful tool for documenting a given situation or the outcome of an event.

The actor linkage matrix is best used with a small group, with people familiar with the technique or after a discussion to summarize findings. We could create an actor linkage matrix with each of the actors, but we can also do it with the synthesis map.

Steps to create a linkage matrix

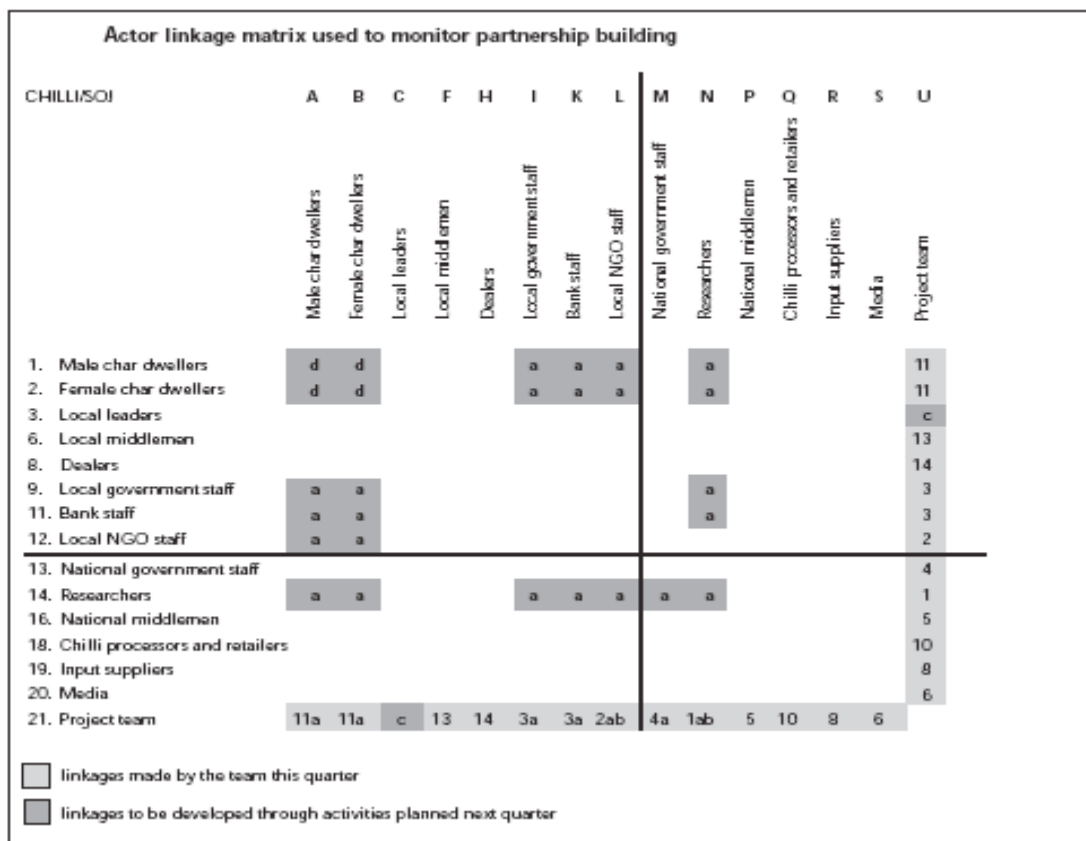
1. Use a spreadsheet program, e.g. Excel.
2. Plot key actors on vertical and horizontal axis.
3. Now each cell in the matrix represents the flow of information from the actor on the vertical axis to the actor on the horizontal.
4. Use symbols or shading to show information flowing from one actor to another. Use an agreed code and fill in for each actor linkage.

Each cell in the matrix can be linked to a piece of text describing the linkage and explaining the ranking given.

- As with the actor linkage maps, a separate matrix can be used to represent past, present and possible future situations.
- For planning and monitoring purposes, symbols can be used to indicate linkages which are targeted for interventions or which have been impacted by a particular activity.

5.5.3 Actor determinant diagram

This is similar to a problem tree. It is intended as a group discussion (or individual thinking) tool to analyse the nature of a particular linkage. The starting point is a cell of the actor linkage matrix or a linkage in the map. Normally, this would be the one that is particularly significant (and might need to be strengthened, weakened or learnt from). The diagram maps weakening and strengthening forces on the linkages and helps a group to identify possible areas of intervention.



Source: Biggs and Matsaert (2004).

Figure 5.6. An example of an actor linkage matrix.

This tool helps us open up a discussion about the feasibility of different actions within the current social and political context. It is a useful tool for building an action plan from the analysis of a particular situation. Therefore, it is often carried out with the key actors who would be involved in any future ‘implementation’ of suggested actions.

Maps and matrices only show the relative strength of relationships and do not give an indication of issues of control, transparency, relative satisfaction with links etc.

The determinants diagram leads from analysis of a particular situation to the development of action plans. For this reason, it is most usefully used with key actors who would be involved in any future implementation of suggested actions.

Steps to build a determinants diagram

1. Identify linkages on our matrix which look particularly important or significant. We have to choose only those which we think are most critical.

2. The group must decide which links to focus on.
3. Work with groups of actors to look more closely at this link (this could be a mixed or single actor group, depending on how well the group dynamic works).
4. Write the linkage in the centre of a flip chart. Ask the group to start by discussing the strengths, examples of successful linking, good experiences etc. Mark these in the area above the link.
5. Discuss any problems experienced with this link. Mark these in the area below the link. For each problem, try to get to the root cause, before going on to discuss the next.
6. Now for each root cause look for potential solutions. Try to encourage the group to make these active solutions (not things other people should do for them).
7. For each strength, look at how this could be built on to further improve this linkage.
8. The final result will be a list of ideas for action. Obviously some 'areas for intervention' (what to do) will be more easily implemented than others. The exercise helps open up a discussion about the feasibility of different actions within the current context.

5.5.4 Actor time lines

An actor time line is a listing of key events in the evolution of an innovation system. Getting a group of key actors to construct an actor time line of key past events for a particular innovation system can build a comprehensive understanding of past change processes and a better understanding of the current situation. The key question to be answered is which actor made key decisions at what time in the past? Once again the emphasis is on human action—it is important to specify who took what decisions, when and where. This will enable us to understand the actual causal effect relationship in a particular innovation system. It also gives a feeling for the dynamics of an innovation system and where it is currently heading. It is important to note that actor time lines are used here more as a learning and reflection tool, a way to establish new common ground in a coalition of partners, and as a tool to guide future action. The time line can either be given as a list of events, with dates alongside as a figure with a sequenced bar chart of actor events over time, sequencing and the path of causation of past events.

Time lines can be generated through a review of literature, individual interviews (particularly with people with a long association with the innovation system) and group discussions. Usually a combination of all these will get you the fullest information. Group discussions with knowledgeable people in the sector are useful to analyse and discuss the implications of the timeline, e.g. trends and new directions.

For the group discussion, use a flip chart or blackboard.

- Start with the earliest recorded memory in this innovation system.
- Now mark key innovations since that time.
- On the time line these can be linked to key events in local or national history, e.g. independence, the year of the big flood etc.
- For each innovation marked on the line, note actors who created or helped the spread of this innovation. These are the key actors.
- Discuss implications: how has this innovation system changed? Where is it heading now? Who have been the key actors in the past and present?

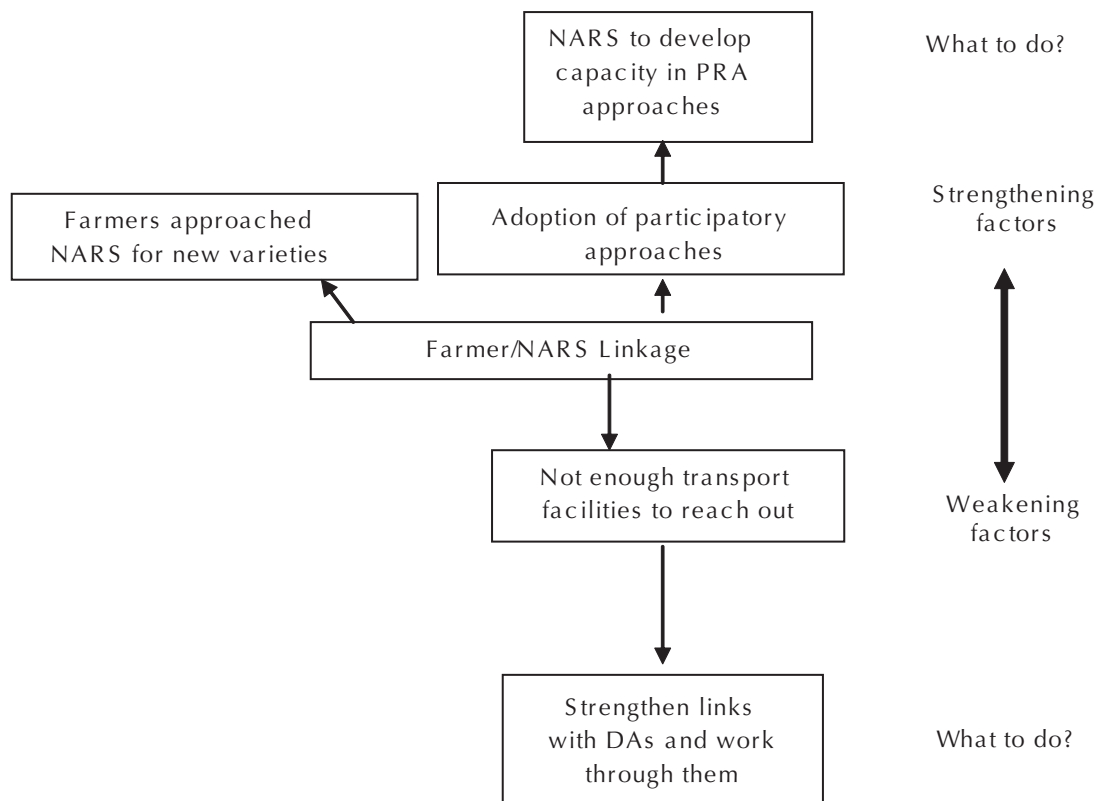
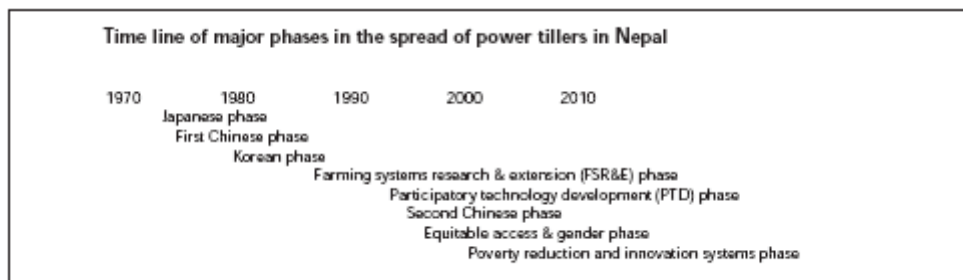


Figure 5.7. An actor determinants diagram.



Source: Biggs and Matsuert (2004).

Figure 5.8. An example of an actor time line from Nepal.

5.5.5 Actor learning and response analysis

This deals with learning and response analysis on the part of coalition partners. There are, however, no specific tools for doing this. However, explicit attention needs to be given to ways in which partners can systematically collect information from different sources, analyse it and draw up local action plans as they go along. The existence of papers documenting this analysis and the planned/actual outcomes can be used to monitor the innovative behaviour of partners in the coalition. In principle, information in all projects can come from three main sources:

- First, from planned activities, which may be planned experiments, development interventions, surveys or meetings. Often in conventional projects, the information from surveys, experiments and meetings is not acted on locally. This is especially the case when academic publications, and 'project requirements' are the primary reasons for planned data collection activities.
- The second source of information is from 'unexpected sources' and is revealed in the process of

collecting planned information or conducting other planned activities. This kind of information is always coming up in projects. For example, in conducting a survey it is found that there is another project in the same region doing similar work.

- The third source of information is from 'unexpected changes' in the context of the project.

Explicit attention to the ways information from these three sources is analysed and used to draw up short-term action plans has become a major component in the actor-oriented approach. Documenting this analysis and the planned/actual outcomes can be used to monitor innovative behaviour of partners in the coalition.

5.5.6 Septagrams

Actors influence interactions within the system in different ways. For example, policy makers design and implement policies and regulations, market actors influence prices, donors finance certain programs, research stations offer certain technological solutions, consumers choose certain products, agro-industries favour relationships with particular producers and producers may favour specific techniques. Each actor therefore has their own influence on the social interactions within the system. However, some actors may exert more influence than others, so that coalitions appear around these 'prime movers'. They may exert strong leadership on the way the knowledge system functions, and hence on the type of outputs and impact the system achieves. This tool focuses on identifying these prime movers/drivers of change and the degree to which they effectively steer the system in a given direction.

Expected outputs

- Identification, based on actors' perceptions, of the 'prime movers'—those who are leaders and have the most influence on what happens within the system.
- A picture, in the form of several septagrams, of the influence and/or leadership of each of the prime movers as seen by different subgroups/actors.

Relevant questions

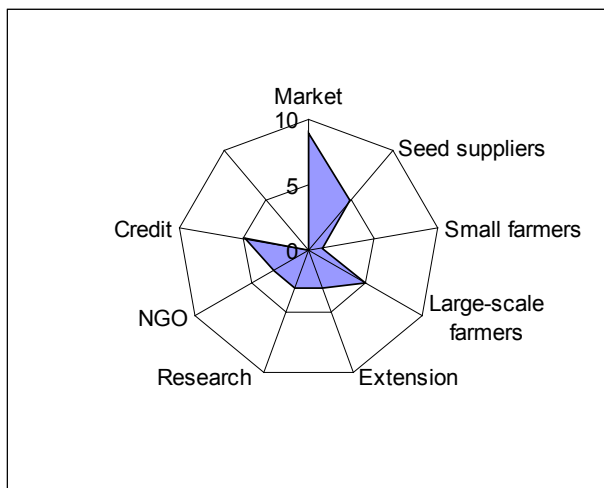
- Who do different actors see as the prime movers in the system?
- Which of these prime movers exert the strongest influence?
- Who could change the situation and would be interested in doing so? Why?

Steps in the process

1. In the group of actors you are interviewing, ask each actor or group of actors to identify the major/important actors in the innovation system.
2. Then ask them to say how strong an influence each different type of actor (internal or external) exerts upon the functioning of the innovation system.
3. Make the discussion visible by asking the interviewee to fill in a blank 'septagram sheet' consisting of a circle and one line for each type of actor in the system.
4. Assign each type of actor a line—ask about each actor separately.
5. Let them decide where to place a sticker on the line representing this particular type of actor.
6. The stronger (the more controlling) the influence of this type of actor, the further away from the centre the sticker is placed. The weaker (the more 'following') the influence, the closer it is put to the centre.
7. There may be more than one prime mover in the centre.

The tools discussed in this section are time and location specific. In a development situation the context determines what is useful to be used when. It is important also to note that analytical frameworks and tools are generally adopted and changed as the work proceeds. An example of a septagram is presented in Figure 5.9.

5.6 Participatory Assessment and Planning (PAP)



10 = 100% controlling, 1 = 100% following .

Figure 5.9. Example of a septagram.

The PAP exercise is a tool for community planning, management and development. It brings all relevant actors together and facilitates them to plan in an interactive way. It helps the community to make its own development plan based on the community needs and to prepare a plan of action to translate into reality (FARM 1998). The method was pioneered in Asia in the FARM program and was introduced into Africa in the late 1990s.

PAP is a process that brings the primary stakeholders, the farm households, to the centre of decision-making. The process recognizes that farm households are part of national social, economic and political systems. The secondary stakeholders are the research and extension services, the NGOs and the private sector who deal with the farm household. The tertiary stakeholders are government ministries who formulate policies and provide the services and resources for their development.

PAP is distinguished from PRA primarily by its emphasis on the community plan as the principal product. The objective of PAP is to build the capacity of farmer leaders and the community to plan their own development through an assessment and planning exercise.

The community must be socially prepared in order to fully understand, participate and own the PAP process. The best time to conduct PAP is usually before the planting season when the farmers are planning for the coming season and spare some time.

5.6.1 Processes involved in PAP

There are a number of processes involved in PAP, which can be adopted, adapted, added, subtracted, or modified according to the need, circumstances and ability of the community. There are five steps involved in the PAP process:

- Mapping of natural resources and assessing problems;
- Assessing the social situation and community needs;
- Collectively create a vision for the future of the community;
- Collectively develop a community plan; and
- Develop an implementation strategy.

The process used by the FARM program is discussed here. Note that some of the terms are used in a very restricted manner, which does not necessarily correspond to regular usage, e.g. PRA.

- 1. Participatory Rural Appraisal (PRA).** This provides the community with an understanding of their natural resources, their constraints, problems and opportunities. A number of tools such as the transect walk, the time line, resource mapping, ownership patterns, cropping patterns and seasonal calendar are used to gather information on community resources.
- 2. Participatory Social Appraisal (PSA).** Several information gathering tools are used to assess social institutions, cohesion and maturity of the community. For example, the FARM program used four of the available tools:
 - Social mapping and identification of local institutions;
 - Time line;
 - Gender role analysis; and
 - Venn diagrams
- 3. Participatory Needs Assessment.** During this the community meets in workshop sessions and identifies their needs. The steps include:
 - Problem identification—list up to five key problems associated with their livelihoods and prioritize them;
 - Possible solutions—identify the possible ways to address these problems;
 - Proposed actions—identify how the group would overcome these problems.
- 4. Community Envisioning Exercise (CEE).** CEE is an interactive process to articulate the community's collective interest with a commonly agreed vision. The CEE process brings the community together for interaction, creating awareness, cross fertilization of ideas, consensus building and decision-making, monitoring action and empowering the community.
- 5. Participatory Community Planning (PCP).** The purpose of community planning is to address one or two key problems identified by the community and to plan some community-based action. All stakeholders are involved in the planning process.
 - The planning process must be simple. FARM focused on the planning on four aspects:
 - Natural resources;
 - Agricultural productivity;
 - Social development and;
 - Infrastructural development.
 - The plan must be based on:
 - Resource ability; and
 - Ability, knowledge and expertise of the community, the potential to build such capacity.
 - The planning process involves:
 - Situation analysis,
 - Problem analysis;
 - Decision analysis (feasibility of the decision); and
 - Potential future analysis (what to do if things go wrong or circumstances change).
 - The decision/eventual plan must be clear:

- Specify what, when, who, how etc.
- 6. Community Consultation and Approval.** This is the so called ‘general assembly’ session of the community and stakeholders. Here the draft vision and mission statements and the draft community plan of action are presented and discussed. This is necessary to get the input and approval of the community.
 - 7. Re-planning with Participatory Monitoring and Evaluation Indicators.** After consultation, a re-planning exercise is undertaken to incorporate full community input. This revised plan will include a Monitoring and Evaluation plan with appropriate indicators and tasks assigned for implementation. It specifies:
 - Who will do what?
 - What are the sources of resources?
 - How will it be done?
 - When will it be done?
 - How will the performance be monitored and impact assessed?
 - 8. Community Endorsement.** The final plan is again presented to the community for endorsement. The plan is fine-tuned and finalized in this session. The various individuals and groups in this session make commitments to participate in the implementation, monitoring and evaluation of the community development plan. The community is now able to request the needed services from the extension services, NGOs, government agencies and others.

The various steps involved in PAP are summarized in Figure 5.10. It must be noted that process involves some costs and therefore the resource requirement should be carefully considered in planning. Since the output of PAP is a community development plan, the community should share the resources required. Finally, it is worth noting that:

- The duration of the entire PAP process is 7–10 days.
- The implementation is reviewed periodically.
- A new PAP should be undertaken every year.

5.7 Participatory Learning and Action (PLA)

Participatory Learning and Action (PLA) is an introduction to conventional development methods proposed towards improving participation of target groups or clients or beneficiaries in the development process. This method establishes a creative avenue for information sharing and learning, and one that challenges prevailing preconceptions about resource-poor people’s knowledge of their own social reality. PLA like other participatory methods encompasses a wide range of methods which promote interactive learning; shared knowledge and flexibility yet structured analysis. The key concepts, principles, methods and techniques used in PLA are discussed in this section.

PLA is distinguished from PRA primarily by its emphasis on learning. PLA differs from PAP by its greater emphasis on the dynamic learning inherent in action rather than the community plan and its implementation monitoring, which are stressed in PAP.

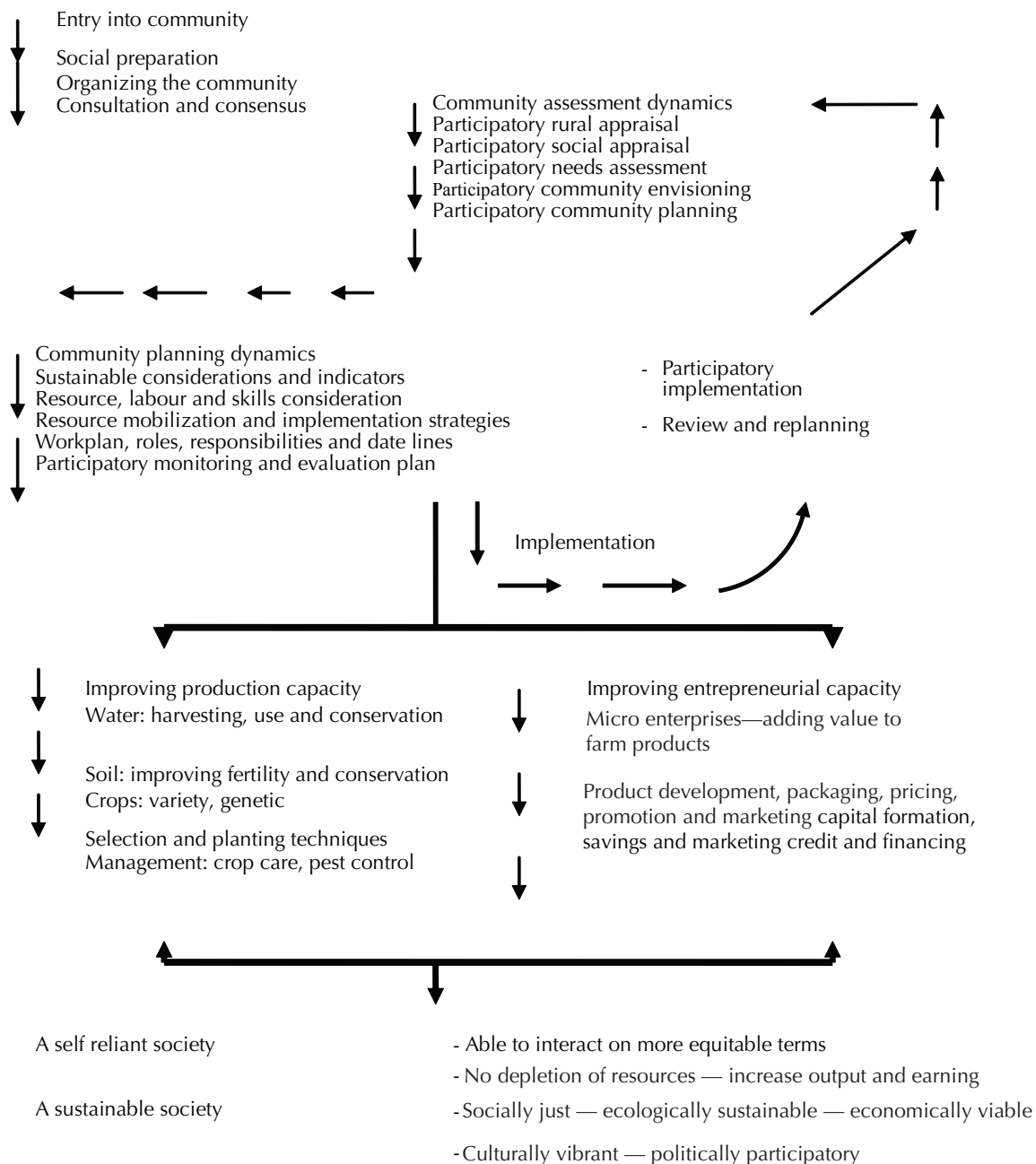


Figure 5.10. Improving the capacity of the rural agricultural community.

5.7.1 Concepts and principles

PLA is an active research approach with a clearly defined purpose of creating knowledge that leads to action, and through reflection, to new knowledge and new action. The basic tool of PLA is dialogue—an interchange and discussion of ideas based on a process of open and frank questioning and analysis in both directions between the investigators and the people, both individually and in small groups (Burkey 1993). The keywords of the process, from which the title of the method is derived, are:

- Participatory: PLA is based on a participatory principle which eliminates, through effective dialogue, the distinctions between the researcher and the beneficiaries;
- Learning: the perception of the target beneficiaries and conditions can be identified and understood only through a learning process involving intimate and continuous dialogue and joint

reflection;

- Action: the process and the dialogue are action-based.

The PLA process is expected to change the change agent's behaviour and attitude. The beneficiaries now become actors. The guiding principles for change agents are:

- A reversal of learning
 - learning from people (directly, on the site and face-to-face)
 - learning from local, physical, technical and social knowledge
- Learning rapidly and progressively
 - flexible use of methods; improvisation, iteration and cross-checking
 - not using blue prints
 - listening and not lecturing
- Off-setting biases
 - covering the whole spectrum
 - not being a development tourist
- Triangulating—using a range of methods
 - multidisciplinary approach to cross-check information
- Seeking diversity—search for variability rather than averages
- Embracing error—treating each mistake as a learning experience
- Listening, keeping quiet and letting people to do things for themselves

In addition, some additional principles of PLA applications are:

- Facilitating (handing over the stick)—to act as facilitator or resource connector in all areas of investigation, presentation and subsequently, the action and reflection of the community
- Self-critical awareness and responsibility—continuously examine behaviour
- Sharing ideas

5.7.2 Techniques

PLA largely involves organized common sense, with a dose of creative ingenuity, borrowing of techniques, adapting and inventing—all within a specific participatory mode. Some of the methods used in PLA include:

- Secondary data collection and analysis;
- Key informant survey;
- Semi-structured interviews;
- Participatory mapping and modelling;
- Participatory diagramming;
- Transect walks;
- Time lines;
- Trend analysis;
- Ethno biographies (local histories of crops, animals, vegetation, pests weeds etc.);
- Seasonal diagramming;
- Livelihood analysis;
- Wellbeing or wealth ranking;
- Stories, portraits and case studies.

'Do-it-yourself' is the basis of PLA. The process is experimental and in all cases the facilitator is learning

along with the participants. The procedure stresses the fact that the methods and techniques of PLA should be integrated as far as possible with the three major phases of development, analysis and initiating the process (primary process); implementation (secondary process); and monitoring and evaluation (tertiary process). The three pillars of PLA are methods, behaviour/attitude and sharing (see Figure 5.11). The basis of PLA is the active participation of all those involved, in a continuous process of analysis, action and reflection (see Figure 5.12).

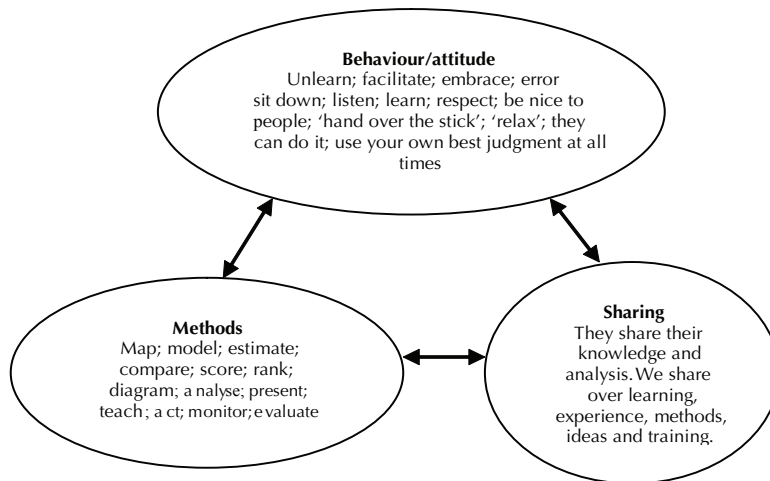
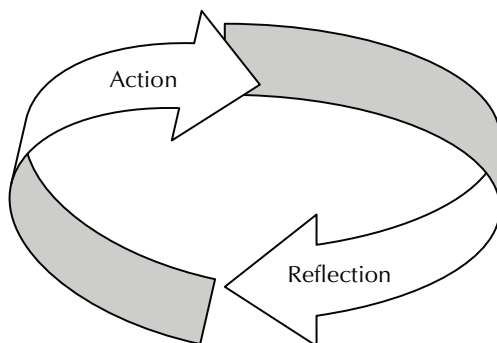


Figure 5.11. The three pillars of PLA.



Source: Adapted from Bless and Higson-Smith (1995).

Figure 5.12. Action-Reflection-Action.

PLA:

- keeps research relevant
- initiates further research
- implements research findings
- guides action
- evaluates action

The final analysis of the process can use the following three techniques (see Figure 5.13).

1. **Review meetings.** Here the community members can present the maps, models, diagrams and finding to the whole community, in order that they may be discussed, clarified and verified, gaps identified, checked and corrected. (Participation)

2. **Ranking.** A method of ranking can help identify and list major issues, problems and possible solutions (learning). In order to encourage participation from all members of the community, this can best be done first in various groups based on gender and age, and then as a whole community.

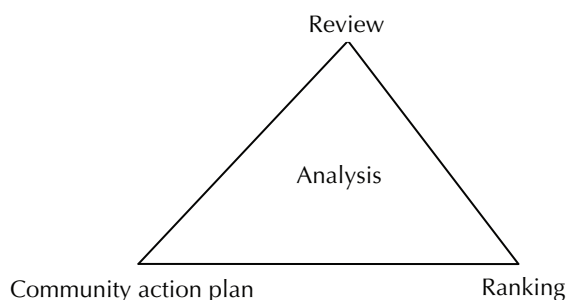


Figure 5.13. PLA analysis process.

3. **Community Action Plan (Action).** This is a process of participatory planning in which communities prepare their own plans, mobilize resources, allocate budget and schedules, and identify areas and ways in which to implement project and monitoring progress.

During the implementation process, the facilitator(s) can contribute to capacity building dimensions to realize further community potential. These may include:

- organizational training
- leadership development
- technical training
- external linkages and capacity building
- exchange of experience and
- support and encouragement

PLA sees research and planning (action) as part of the learning process of a community and is therefore part of the development strategy itself. There is cost involved in undertaking PAP exercise. So the resource requirement should be carefully considered in planning. Since the output of the PAP is a community development plan, the community should share the resources required.

5.8 Participatory Farm Management methods (PFM)

Participatory Farm Management methods (PFM) are used to facilitate the needs assessment of the smallholder farmers. There are two basic reasons for using PFM:

1. Traditional farm management methods are usually applied by outsiders based on records or questionnaires.
2. Most of the existing participatory methods do not allow in-depth quantitative analysis of specific management problems. Fewer still enable the analysis of the effects of the potential interventions on resource use, thereby allowing potential solutions to be screened and evaluated by farmers from an economic point of view prior to further investigations.

PFM is designed to be used by farmers with outsiders acting as facilitators. These methods aim to assist farmers and researchers to quantify and analyse the use of resources in farm and household. The participatory farm management methods are therefore expected to complement the existing participatory methods in that it provides quantitative analysis by farmers themselves. The four techniques used in PFM are causal diagram/problem tree, resource allocation maps, participatory budget and resource flow diagram. These are outlined in this section.

5.8.1 Causal diagram/problem tree

Causal diagrams are useful in identifying the causes of specific problems and the connection between problems; however they give no indication of the relative importance of the different factors causing each problem. This is a technique which the farmers and researchers can use together to identify the linkages and relationships between problems and causes. It is a tool which can be used to help analyse problems and aid discussions of solutions/interventions.

Scoring gives an indication of how important the cause of the problem is. In the example given in Figure 5.14. (for Zimbabwe) the farmers received low income from cotton due to low yield and poor quality. The scores assigned 25 for poor quality and 75 for low yield indicate that the low yield is much more critical than poor quality, although both factors contribute to low income.

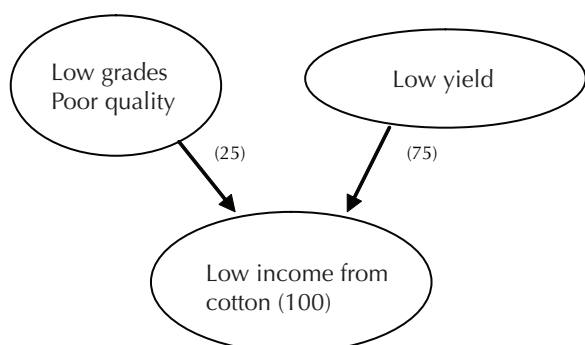


Figure 5.14. Scoring flow diagrams.

It is often more useful to score just part of the diagram, rather than the whole of it. If a problem has more than one effect, the scores from these effect arrows are added together and then divided between the different causes of the problem. In Figure 5.15 the low yield was due to pests and poor germination.

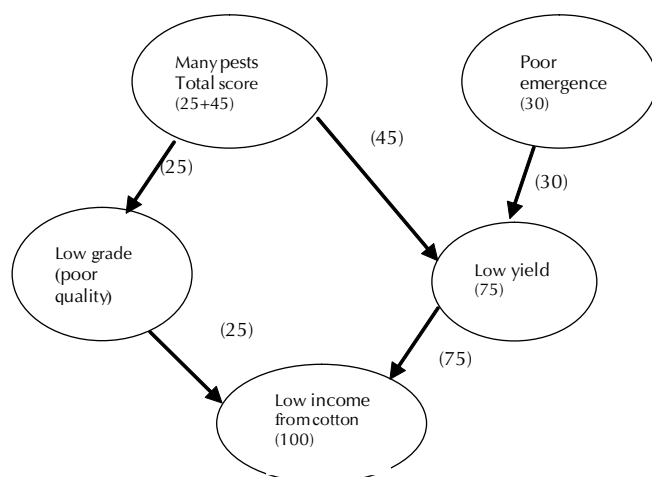
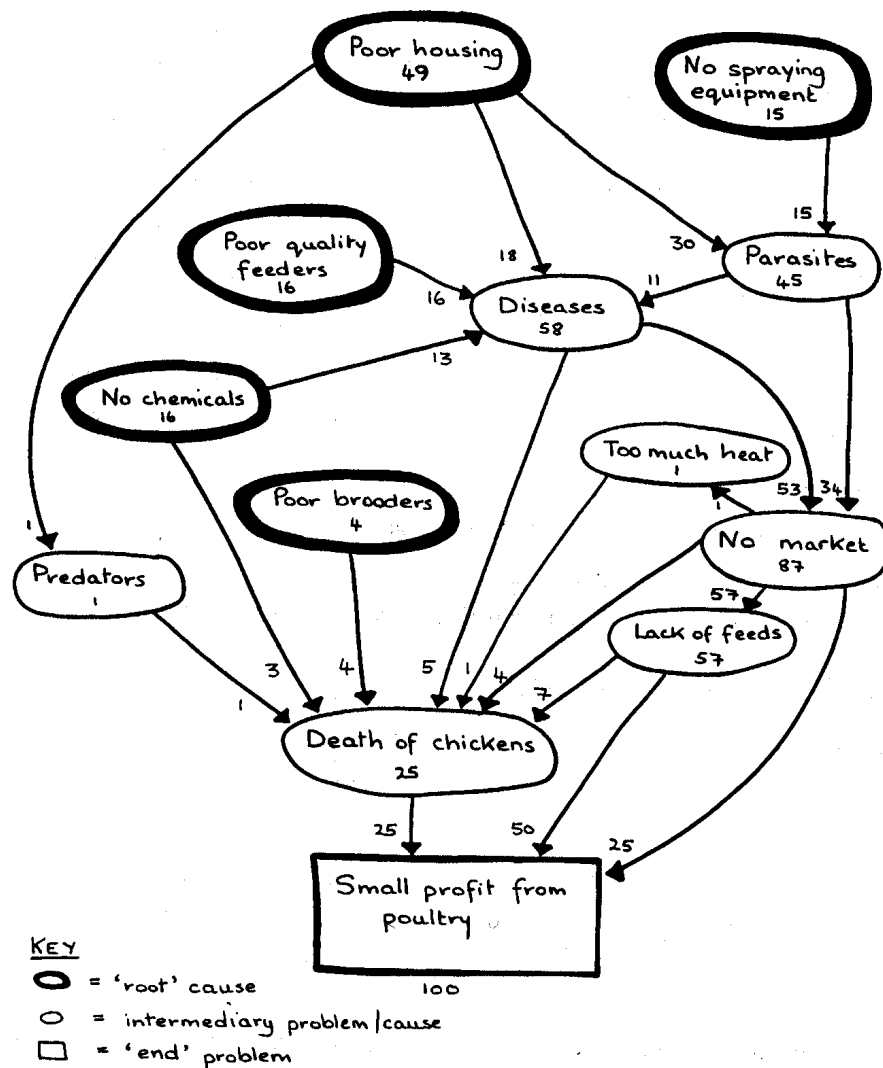


Figure 5.15. Scoring flow diagrams with multiple effects.

The total score of 75 given to low yield has been allocated to these two causes: pests (45) and poor emergence (30). Pests also contribute to low quality. The score for pests is 70 because it contributes to both low yield (45) and poor quality (25). This type of scoring approach can be compared with the original ranking of the farmers obtained through semi-structural interviews or informal surveys. It is important to note that the primary or root problem has no cause arrows. In general, problems which

are out of the control of farmers may require external intervention. A livestock related example is given in Figure 5.16.



Source: Galpin et al. (2000).

Figure 5.16. Scored causal diagram for a poultry enterprise, Buhere district, Zimbabwe.

5.8.2 Participatory budget

This method seeks to quantify the use of resources while avoiding the limitations of traditional farm management methods. To prepare participatory budget, a row of holes in a board or on the ground can be used. Stones, beans or any seed can be used as a counter to measure the quantity of resources used. The time period is represented by each hole and the resources are indicated by different coloured beans and different rows. The format of a typical participatory budget for a maize enterprise is represented in Figure 5.17. The quantity of inputs or resources is indicated by the number of beans in each cell.

The monthly labour input for the activities are represented by the number of beans. Each enterprise is represented by a row. Different colours can represent the different type of labour (hired, family, male, female etc.).

Cropping Season						Enterprise/cost
Oct *	Nov	Dec	Jan	Feb	March	
						Labour:
○ ¹	○	○	○	○	○	Land preparation
○	○	○	○	○	○	Planting
○	○	○	○	○	○	Weeding
○	○	○	○	○	○	Harvesting
						Purchased inputs:
○	○	○	○	○	○	Seed
○	○	○	○	○	○	Fertilizer
○	○	○	○	○	○	Chemicals
○	○	○	○	○	○	Other costs

* Beginning of the crop season

¹ Each cell is completed by the participants for each enterprise.

Figure 5.17. Format of a participatory budget.

In a similar way a whole farm labour budget could be constructed as shown in Figure 5.18.

Cropping Season						Enterprise cost
Oct *	Nov	Dec	Jan	Feb	March	
○	○	○	○	○	○	Sunflower
○	○	○	○	○	○	Maize
○	○	○	○	○	○	Livestock
○	○	○	○	○	○	Groundnut

Figure 5.18. Whole farm labour budget.

The potential benefits of participatory budgets are:

1. It improves communication between farmers and researchers, farmers and extension staff, as well as among farmers;
2. The tool helps analyse past activities;
3. It helps plan and assess the feasibility of planned activities;
4. It explores the implications of using new technologies;
5. It helps compare two or more enterprises;
6. It assesses the risk involved; and
7. It gains information on resource use, which is important to the farmer and this varies with time.

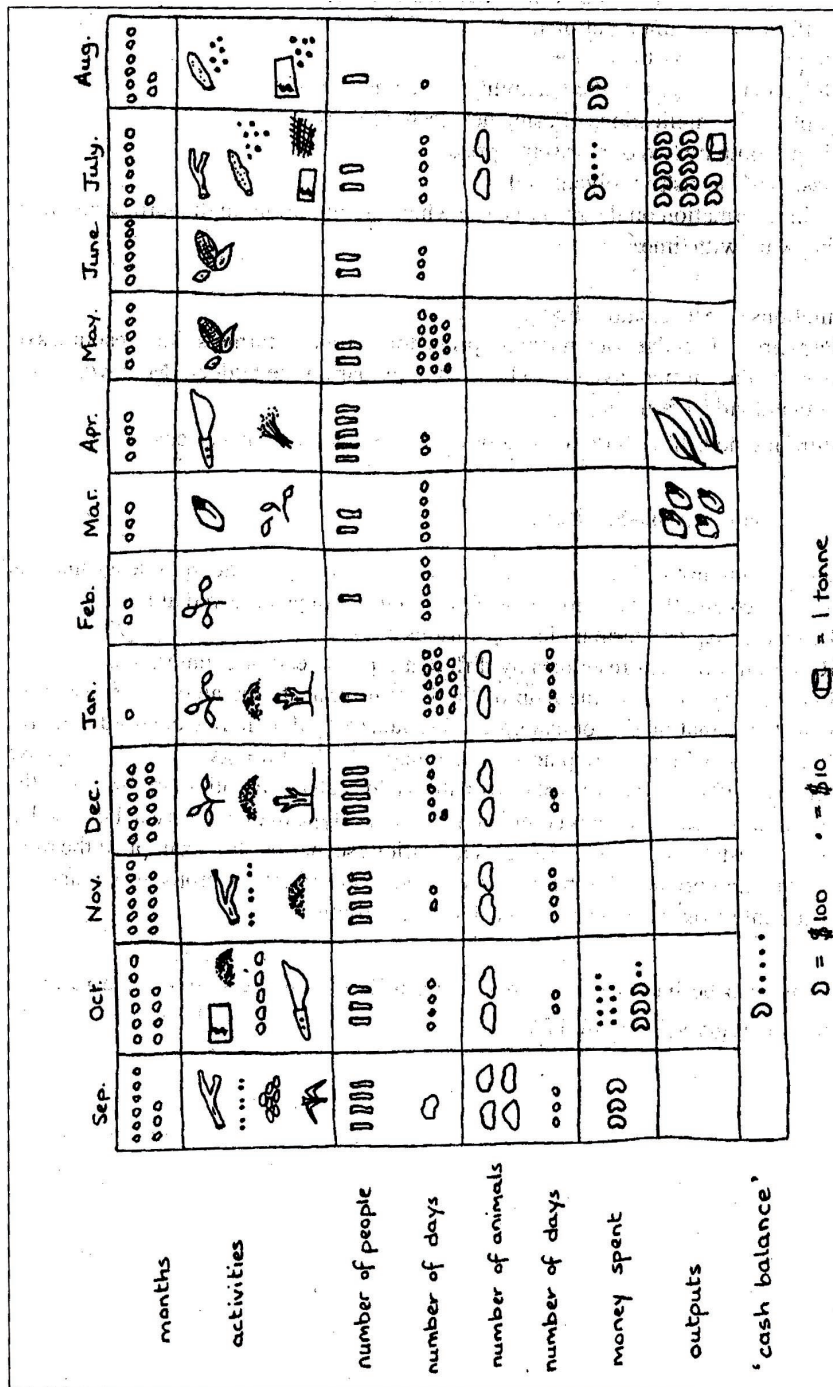


Figure 5.19. Example of participatory budgeting.

- Two limitations of participatory budgets are:
- Participatory budgets are not appropriate for a group of farmers since resources of a particular farmer must be used in preparing the budget. May work well with individual farmers.
 - PFM methods like all PRA methods are time consuming, hence costly.

5.8.3 Resource allocation maps

This technique attempts to build on the technique of mapping and incorporate an analysis or resources used and their quantities on a given farm. Steps involved are:

1. Draw the map of a farm indicating various plots;
 2. Represent different resources by different type of seed or counter; and
 3. Place the counters on the map of the farm to indicate the amount of resources invested in that field.
- For example if three scotch carts of manure were used in maize field A, then three beans are placed on the map. If 300 shillings is used to purchase fertilizer, 30 bean seeds are placed on that field each representing Sh. 10. Once the resource allocation map is completed, 'what if' type of questions can be raised in order to establish farmers' strategies for various scenarios. For example, if the rains are late and predicted to be poor how would this affect the crops grown and the different resources invested in each of the activities.

Outputs can also be included on a map using different counters. A sample resource allocation map is given in Figure 5.20.

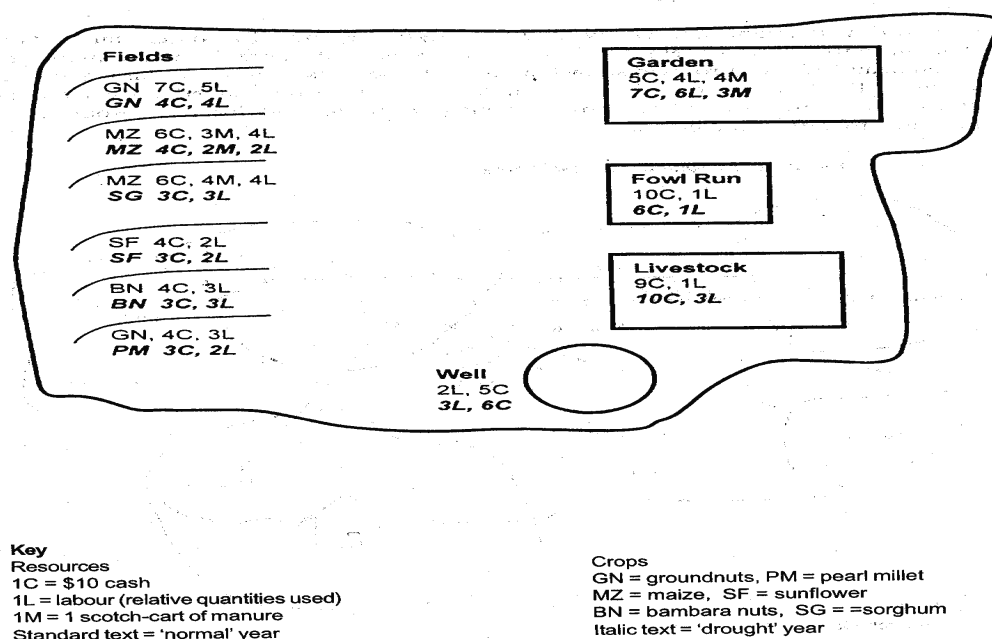


Figure 5.20. Resource allocation map for Muridzi's farm.

5.8.4 Resource flow diagrams

Resource flow diagrams are widely used to analyse the flow of resources/nutrients in sustainable agricultural systems. This technique involves the drawing of a farm map on the ground and adding arrows to show the flows of resources between on-farm activities (see Figure 5.21). Flows to and away from the farm can be also added: once again the quantity of resources is indicated by the number of beans, and different resources are represented by different colours.

These participatory farm management technique permits farmers and researchers to jointly analyse farmers' use of resources in order to improve farm management and to identify researchable constraints and opportunities. Resource use implications at the farm level of the proposed interventions can also be studied. Some of the tools used in PRA methods are also used in PFM.

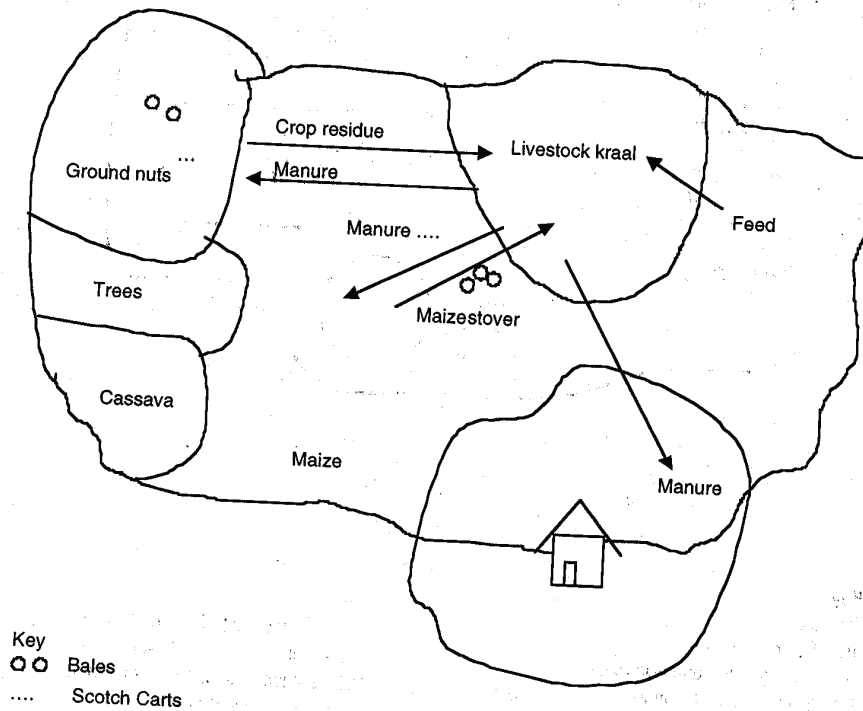


Figure 5.21. Example of a resource flow diagram.

5.9 Participatory Rural Communication Appraisal (PRCA)

Participatory Rural Communication Appraisal (PRCA) is characterized by a focus on local information and communication systems. It is used to diagnose information and communication constraints acting at the farm, household and community level and to identify interventions to improve information and knowledge sharing among local stakeholders. PRCA thus supports efforts directed towards improving technology development and dissemination. In this section, the major differences between conventional communication methods and PRCA are outlined, and the steps involved in planning and implementing participatory communication are discussed. Table 5.6 illustrates some possible communication-related causes of non adoption of suitable technologies by smallholder farmers.

5.9.1 PRCA and conventional development communications methods

If farmers are unable to articulate priority problems, researchers may tackle the wrong problem, and farming systems research (FSR) was developed to help overcome this problem. If extension processes do not communicate the relevant attributes of technologies, farmers may not know about the technology or may decide wrongly to not adopt the technology. The communication related problems can be addressed using modern development support communications methods. One of these methods is PRCA, which was developed from PRA.

PRCA is distinguished from traditional development support communications methods by its participatory, community-centred approach. Conventional methods, as employed in extension agencies in the 1960s and 1970s, tended to be 'top-down'. The principles underlying PRCA, on the other hand,

are similar to those of PRA. It empowers farm women and men, and encourages group reflection and participatory planning for action. The essential difference relates to orientation or purpose (Table 5.7). PRCA has a clear focus on information and communication-related issues.

Table 5.6. *Communication-related causes of technology non-adoption*

Aspects of innovation and adoption	Intervention-related causes	Farmer-related causes
Problem perception	Lack of farmer participation in problem identification, leading to misperceptions regarding farmers' goals	Inability of farmers to articulate priority problems for different groups
Experiments	Trial purpose and design not properly communicated	Poor knowledge or motivation to manage the trials
Awareness	Insufficient or ineffective communication	Selective exposure/perception; lack of farmer-to-farmer communication
Legitimization	Wrong source/effect of messages	Laws, traditional norms, peer-group or leadership opposed to technology
Attitude	Communication not persuasive	Complacency; fatalism
Comprehension	Technology attributes incorrectly communicated, including system-fit and relevance to farmers goals, especially for complex technology	Selective retention
Demonstration	Demonstration purpose not obvious or not properly communicated	Demonstration environment perceived to be atypical
Adoption	Failure to inform/coordinate other supporting services, e.g. input and output marketing	Farmers perceive that a different technology is more attractive

Source: Adapted from Anyaegbunam et al. (1998).

Table 5.7. *Contrasts between conventional development communication and PRCA methods*

Conventional communication methods	PRCA method
Not holistic—focus on communication issues alone	Holistic—integrates community needs opportunities, problems, solutions and communication issues, networks and systems
Top-down, not participatory: the researcher extension agent acts unilaterally	Participatory: Facilitation of rural peoples involvement in communications-related development interventions
Extractive and does not empower or build capacity of communities	Empowers and builds capacity of communities and improves internal and external communication links
Professionals plan communication intervention without the community	Joint planning of development action and supporting communication actions with community
Targeting according to determined external criteria. Farmers are viewed as passive recipients of messages	Self-selected interaction groups with common problem. Farmers are active participants in the entire process
Results of research are not shared with community, but presented by and to outsiders	Results of appraisal are presented by community and to community
Results are owned and kept by researchers extension workers	Community owns and keeps the results
Emphasis on verbal mode of questioning and gathering data, normally through questionnaire	Emphasis on the use of visual methods and group work for generating, analysing and presenting data
Emphasis on finding out ways of changing of attitude and behaviour of farmers	Emphasis on change of attitude and behaviour among facilitators
Emphasis on how best to effect transfer of outside technology to farmers	Mutual understating between insiders and outsiders in order to link indigenous knowledge with outsiders' knowledge and skills for designing communications support

5.9.2 Implementing PRCA

PRCA uses PRA tools, including mapping, Venn diagrams, seasonal diagrams etc. However, the focus of the application is not necessarily on agricultural resources and production practices, but on knowledge, information availability and sources, and information flows within the community and with the outside. The key to facilitating people's participation in PRCA is to establish good rapport and trust with the community from the beginning of the appraisal. Generally, farmers appreciate the focus on information and knowledge. PRCA is a very flexible and adaptable method. As with PRA, the purpose and scope of a PRCA should be determined at the outset. Within this defined scope, the content will evolve interactively during fieldwork.

As with most participatory diagnosis, the scope of a typical PRCA includes the farmers' main needs, interests, problems, and aspirations as well as their strengths, weaknesses, opportunities and threats. Based on information about the social system in the community, PRCA distinguishes different farmer groups and their perceptions, attitudes, knowledge and practices in relation to selected needs and problems. The key sources of information as well as the existing traditional and modern communication networks within the community are identified, as well as the discovery of obstacles and issues amenable to resolution through the application of communication. The types of information required to design a communication strategy to support technology development and transfer are described in the following sections.

Community profile

Rural communities are not homogeneous. It is possible to identify various groups of farmers with different resource bases, different production systems and different priority problems. Their views of development options often differ greatly from outsiders' views of the same community. The profile should cover resource availability, and economic, social and institutional aspects.

Needs, opportunities, problems and solutions (NOPS)

The identification of farmer groups' priority needs and problems is the first step towards designing a communication strategy. Different farmer groups have different NOPS. Needs are defined in a fairly broad way, in relation to farmers' goals. Opportunities are often overlooked: if properly exploited these situations may improve the living conditions of the community. Problems are the negative undesired situations that constrain or stop communities from achieving their basic needs. Solutions are ways of resolving the defined problems. During this step, groups of farmers who are most affected or who can contribute to solutions are identified. This step resembles an FSA diagnosis. If an FSA diagnosis focusing on communication issues has been completed and documented, then this step may be reduced in scope or omitted.

A preliminary problem analysis may be conducted by the researcher before fieldwork commences. In the field, problem tree analysis (a cause-effect analysis) should be carried out with the community, or preferably with the relevant interaction groups. The areas of agreement between these analyses will lead to the identification of Windows of Perceptions (WOPS). The merger of researchers' preliminary problem tree and the community problem trees generates a joint analysis of the problem, which becomes the foundation of the communication strategy. Perceptions and language play major roles in the analysis of problems and solutions.

Interaction groups

Interaction groups include farm-households, farmer groups, associations, agencies or stakeholders inside and outside the community whose activities, needs and problems affect the farming community. Interaction groups are the key dialogue partners. These groups are not passive receivers of information, but groups whose knowledge and opinions are valued and incorporated. They are sources of information and initiators of action as well as decision-makers.

All farming communities are made up of different groups: men, women, livestock owners, the literate, the illiterate etc. Some groups in the community such as the very poor, the invalid, outcasts or the sick might be 'invisible'—these should be actively sought out.

The relevant communication systems, idioms and communication issues for each interaction group and NOPS should also be described. Examples of communication-related issues include inadequate participation in the planning, implementation and evaluation of interventions. Other possible obstacles include low awareness of the problem, lack of commitment, insufficient knowledge etc. In technology transfer, communication problems often lead to the non-acceptance of dissemination technologies. The PRCA should provide an in-depth understanding of the NOPS, and the related knowledge, attitudes, beliefs and practices for each interaction group.

- **Knowledge.** The research team should identify the indigenous and modern knowledge of the interaction group related to the NOPS. Indigenous technical knowledge of the group includes localized techniques and practices, which are handed down from father to children. These were often based on generations of experience and were, at least originally, in harmony with prevailing environmental, economic and social conditions. On the other hand, modern or adopted knowledge compose those techniques, processes and practices that were recently introduced into the community from outside.
- **Attitudes.** PRCA explores the mental positions—negative or positive—in regard to recommended technologies or other interventions. Often attitudes dictate farmers' decisions concerning technology adoption. With such information a communication strategy can be designed to change a negative attitude in order to support the adoption of sound technologies.
- **Beliefs.** Beliefs affect attitude and ultimately decisions on technology adoption. Thus, PRCA explores the interaction groups' beliefs in relation to the testing and adoption of the technology under discussion. Although some of these beliefs might resemble superstitions, positive references to them in promotional messages may determine the success or failure of the communication and the adoption of the recommended technology.
- **Practices.** PRCA observes and documents the practices of the interaction group. Practices are based on knowledge, and may be indigenous or modern/adopted. Understanding the basis for present practices helps to analyse technology adoption decisions.

In relation to the knowledge, attitudes, beliefs and practices of each interaction group, the following communication-related information should be collected.

- Their perceptions of the priority problem and proposed technology, positive and negative;
- Social/cultural/economic/environmental flexibility to accommodate the change from technology adoption;
- Their degree of participation in the technology adoption process;
- Who influences and who makes the adoption decision, e.g. self, partner, group leader, outside decision-maker;

- Idioms, and existing/new images or other specifics associated with the technology;
- Events and history related to the problem and the introduction of the technology; and
- Availability and effectiveness of communication channels to learn about technologies (relevant and preferred information flow system, e.g. interpersonal channels, participatory, group, theatre, ceremonies, market days; relevant and preferred media, existing and new, relevant and preferred training methods).

5.9.3 Information and communication resources and networks

PRCA identifies effective ways of communicating with farmers in mass, group or interpersonal modes. The traditional and modern information and communication resources and networks, including the influential individuals and groups in the community who provide information and advice about development issues, are described. The prevailing communication linkages to external sources are defined. The nature of the information transmitted through each network, and the potential for wider use, is identified.

- **Levels of education in the community.** PRCA reveals the levels of knowledge, numeracy and literacy, in relevant languages, in the community. This information reveals whether the community can communicate effectively through the written word and in what language. It also identifies the people in the community such as teachers and school children who can be reached with written materials for further dissemination.
- **Communication resources.** Communication resources include radios, meeting grounds, training centres, songs, dance groups, associations, rituals, events, initiation groups etc. Information concerning the accessibility of these resources to each interaction group within the community helps develop a communication program. The ways in which these resources are utilized for technology transfer should be documented. The groups, in the community and outside, who have a particularly strong influence on the behaviour, or the awareness, knowledge, attitude and practices of members of the priority interaction groups need to be identified. It is also essential to identify the attributes of the role models, both internal and external, for the interaction group. These attributes can be used in the selection of the sources of information/advice for the priority interaction group.
- **External information sources.** The external sources of information concerning the technology, e.g. seed company, market and their attributes; , e.g. reliability, accessibility, are identified. This helps to define an effective communication program.

5.9.4 Indicators

Finally, PRCA should assist the community to identify both the quantitative and qualitative indicators for monitoring and the evaluation of the communication program. PRCA can identify some quantitative indicators, and also provide the basis for the design of a baseline study. PRCA should assist the community to set their own qualitative indicators for participatory monitoring and evaluation of the program. This set of indicators is defined by the community and often reflects measures of their satisfaction or disappointment with the program. The evaluation is generally done with a post implementation PRCA to assess the qualitative impact of the program on the people in the community.

In summary, PRCA draws on the well proven methods of PRA in order to diagnose and define communications related problems and interventions. In the context of technology development and

transfer, PRCA enhances the participation of farmers, focuses efforts on key problems and expedites the transfer of relevant knowledge concerning technologies to and within the community.

5.10 Rapid Appraisal of Agricultural Knowledge Systems (RAAKS)

The Rapid Appraisal of Agricultural Knowledge Systems (RAAKS) is a participatory method for facilitating innovation and development among multiple stakeholders with different goals and perceptions. Its conceptual base is Agricultural Knowledge Information System (AKIS) which focuses on information and knowledge as the common denominator among various actors in agricultural development (Röling 1983; Engel and Salomon 1997).

The method of RAAKS was pioneered by researchers at the Wageningen Agricultural University of the Netherlands, as a strategic diagnosis of AKIS, focused on knowledge management. A related adaptation developed in FAO is Agricultural Knowledge and Communication Systems (AKCS). The method has also been proposed for rural application as Agricultural and Rural Knowledge Information Systems (ARKIS). The RAAKS approach and tools resemble those of FSA, except the emphasis is placed on information and knowledge rather than production technology.

RAAKS is useful for organizations that seek to improve their own performance through innovation. Organizations fostering innovation processes need to be aligned with broader, governmental, non-governmental and private organizations to improve their own capacity to innovate and to make use of innovations. Some development interventions support and/or guide innovation in a particular direction. RAAKS helps develop a thorough understanding of the social and organizational issues involved in innovation, to formulate concrete proposals for action in a participatory manner, and to ensure mutual understanding among stakeholders.

5.10.1 Principles

RAAKS is one of the families of participatory methods, which includes RRA, PRA, PRCA and PTD. They share several points in common: a defined method and built in learning processes; the use of multiple perspectives; an insistence upon group inquiry; facilitation of participation by both experts and other stakeholders; and a focus on designing and implementing sustained action.

RAAKS focuses on the social organization of innovation. Thus, key areas of inquiry are how actors (individual and organizations) build and maintain relationships with each other to foster innovation, how actors organize themselves to learn, how they network, cooperate and communicate for innovation, what hampers their capacity to learn and what helps them to learn new practices faster.

In this way RAAKS complements PRA, which focuses more on local occupational and livelihood systems and general conditions enabling and/or constraining their development. RAAKS and PRCA both concentrate on information and knowledge, and thus have much in common. RAAKS also complements PTD, which helps to create a process of creative interaction between local community members and outside facilitators to experiment with and develop technologies for improving local community to sustain the technology development process. All four methods use participatory techniques that empower farmers, regardless of their educational level, and which also tend to stimulate action.

The five guiding principles of RAAKS are systems thinking, multiple stakeholders, participation of these stakeholders, active learning and action planning.

- Systems thinking

Situations are analysed from a systems perspective, e.g. a knowledge and information system, in which various actors cooperate in order to achieve shared objectives. The development of knowledge through innovations usually depends on a number of actors. Thus, innovation is a function of social rather than individual competencies.

- Multiplicity of stakeholders, interests and objectives

Different stakeholders usually perceive problems and preferred solutions in a different fashion. Conflicting interests arise from different objectives of the stakeholders. In addition, doubts, disagreements and prejudices may also complicate the situation. In RAAKS, these are addressed and space is created for discussing problems and identifying mutually agreeable solutions.

- Participation of stakeholders

All stakeholders should be involved and contribute fully to formulating, monitoring and evaluating and implementation of innovation projects. In all stages of development stakeholders are encouraged to put forward additions, new insights or any other necessary consideration.

- Learning process

An active learning process among the stakeholders is facilitated. Joint inquiry enriches the way individual stakeholders perceive a situation and changes deep-rooted convictions and beliefs. Stakeholders begin to see their role in innovating and strengthening the network in which they function in relation to other stakeholders. A better climate for collaboration emerges.

- Action planning

RAAKS is action-oriented. An important end-product of a RAAKS activity is a concrete action plan stipulating who is going to do what, when and how, towards the realization of technological (organizational) innovation.

5.10.2 Implementation

RAAKS is characterized by a structured analytical design and procedures. The method is structured into three phases: problem definition and system identification; analysis of constraints and opportunities; and action planning. Within each phase, different windows provide specific angles from which to analyse a given situation. Each phase and window has a set of participatory tools; many are similar to familiar PRA tools for participatory specification, analysis and ranking. When combined, the results provide a comprehensive, multi-stakeholder perspective of the problem situation.

The three phases can be described as follows.

- System identification and problem definition

The boundaries of the AKS are identified, the goals, priorities, understanding and perception of each stakeholder are identified and the key development problem determined, with regard to the information/knowledge system. In the first phase five windows are offered for exploring the problem, identifying the stakeholders and defining the environment in which they operate; thus the knowledge system with reference to the defined problem is put into perspective.

- Analysis of constraints and opportunities

As in FSA, following the problem identification, the active constraints feasible opportunities are defined using participatory methods. In the second phase, eight windows are available for highlighting and focusing on different characteristics of the knowledge system. Here a selection of windows and tools has to be made, depending on several factors; the problem situation at hand, the RAAKS teams' preferences, and the time and human resources available.

- Action planning

The final step produces an action plan for problem solution, developed in a participatory manner. This includes the usual components of community action plans, covering key questions such as what, who, how, when? In the third phase, efforts are directed towards developing a joint action plan to improve communication and collaboration.

The implementation of RAAKS emphasises involvement of all stakeholders or their representatives, facilitated by an individual or a team, by insiders and/or outsiders, by professionals or students, or any combination of these people.

A preparatory workshop may be held to familiarize the team members with each other and with the RAAKS method. Also the relationship with actual stakeholders and their participation has to be planned and managed carefully. RAAKS contributes to team building, communication and joint learning among team members. Also it provides some support for developing interview skills and for the planning and management of workshops.

Stakeholders are actively engaged in collecting/analysing information and validating findings and conclusions. Very often stakeholders participate in the RAAKS research team or implement the enquiry themselves with the support of a RAAKS facilitator. Information is gathered through the analysis of secondary data, interviews, group meetings and sometimes questionnaires. At the end of each phase, through workshops and seminars, findings and conclusions are presented to the stakeholders in order to be validated. The duration of a RAAKS exercise varies from three weeks to a year, depending on the objectives, size of the RAAKS team, the problem situation and the resources available.

5.10.3 Outputs

RAAKS results in both content and process outputs. The content outputs include:

- Better definition of a problem;
- Overview of opportunities and constraints regarding innovation;
- Enhanced insight in the support for specific innovation; and
- Action plan.

The process outputs include:

- Improved understanding among stakeholders;
- Establishment of a strong network of actors;
- Better environment for collaboration;
- Strengthening of learning process among stakeholders;
- Greater commitment amongst actors towards achievement of agreed goals/objectives; and
- Improved problem solving capacity through improved communication and joint learning between/among stakeholders.

5.11 Participatory Extension Approach (PEA) process and tools

The concept of PEA was described in Chapter 3. This section describes the process and tools employed in PEA.

There are four major phases of the PEA process:

Phase 1: Social mobilization: facilitating the communities, own analysis of their situation

Phase 2: Community-level action planning

Phase 3: Implementation and trying out/farmer experimentation

Phase 4: Monitoring the process through sharing experiences, ideas and self valuation

It must be remembered that PEA is a continuous process of learning and does not end with the four phases identified. The cycle repeats itself but with a different set of problems. The details of the four phases are discussed in the following sections.

Phase I. Preparing the community: Social mobilization

There are several steps involved in this process:

(a) Entering the community and building trust. Largely achieved through informal meetings with as many local leaders as possible. During these meetings the extension worker explains the PEA approach to local leaders. These meetings also give an opportunity to find out about local institutions and to seek partners and responsible representatives within the communities with whom a working relationship could be established. During this community building step, the extension workers learn about people's perceptions of the local institutions, and about their problems and needs.

(b) Identifying and supporting effective local organization. Most communities have locally-constituted institutions and organizations, e.g. farmer groups, church groups etc. Identification of effective local organization can be completed through facilitation of an 'institutional survey' by the community members. This survey deals with roles, functions, mandates, activities, strengths and weaknesses as well as peoples' perceptions about each of the community organizations identified. In addition, Venn diagrams could also be used to identify the roles and relationship of the various local organizations.

(c) Feedback to the community. Here, the extension worker remains neutral and just presents the findings of his research. This feedback is the starting point of a process of institutional/leadership development and creating accountability. At the end of this meeting the group makes an initial selection of possible institutions to work with.

(d) Raising awareness in the whole community. At the initial stages only a few community leaders and representative participate in the exercise. Thus there is a need to interact with the whole community. Very often this is achieved through a workshop to which the whole community is invited.

(e) Identifying community needs. Prior to any intervention, the extension worker needs to work with the community to identify their needs. The community may not be homogeneous. Thus it is important to identify the different groups of farmers within each of the community—this could be based on resource base. Then the extension workers need to hold intensive discussions with individual families within each of the group to understand their needs.

Community mobilization is a key step in all participatory research and development activities. Therefore, this aspect of community mobilization is discussed in detail in the following section.

Phase II. Community level action planning

A collective decision-making and ownership of project is vital for the success of any community-based initiative. Once the needs are identified based on individual household level investigations, a community level meeting is needed to provide feedback, to get consensus on priority needs, for analysing the underlying causes, to decide on the intervention, and schedule of work to identify local institutions for implementation as well as to agree on the indicators of success. This phase includes prioritizing problems and needs, searching for solutions, mandating local institutions and action planning.

(a) Prioritizing problems and needs. At these community-based meetings, information generated from individual discussions and small group discussions are presented. The purpose is to get consensus. Consensus does not mean that only one problem or need can be addressed. The priority problems identified need to be analysed more deeply. Problem trees and flow diagrams can help to visualize the causes and effects and to clarify in more detail what the underlying causes are.

(b) Searching for solutions. For each priority problem identified and analysed, possible solutions are identified by the workshop participants. The search for solution should first focus on people's own knowledge. However, the search is not limited to people's existing knowledge. There is a need to blend the local knowledge and ideas from outside. Exposure or 'look and learn' tours to innovative farmers, neighbouring communities or research stations can be planned to get more ideas.

(c) Mandating local institutions. Once the possible solutions have been identified, the community should agree on the possible organization to take lead role in implementing the intervention. These local organizations have to be mandated to coordinate activities and take responsibilities. If the community feels that the organization is weak, options on how to strengthen it need to be discussed.

(d) Action planning. Once the possible intervention/solution as well as the lead local organization is identified and agreed upon, a detailed plan for implementation needs to be worked out. This plan should include list of activities, timing of activities as well as the responsibilities of the various stakeholders in the implementation process. At this stage the community is able to define clearly the nature of support they expect from extension workers or outside the community.

Criteria and indicators to measure the success of the activities, data requirements, method of data collection as well as the individual/group responsible for collecting data have to be agreed upon while planning. This will facilitate the monitoring and evaluation process. It is the community's effort, and they must be able to assess the progress made.

Phase III. Implementation and farmer experimentation learning through experimenting

The actual implementation involves mobilization of resources and implementation of activities. This step helps to revalue local knowledge, its combination with techniques and a synthesis of the two. The actual farmer experimentation strengthens farmers' confidence and their own capacities and knowledge.

During implementation, new questions and problems may arise, which will become the community's action research agenda. The extension worker keeps track of all new developments in the area and encourages farmers to share any new ideas. Learning through practical experience as well as information sharing, are critical to the success of participatory extension and necessary to encourage more widespread trying and testing of ideas and innovative practices.

Phase IV. Monitoring and evaluation through sharing experiences and ideas

This phase consists of joint learning by sharing ideas and experiences, and by reflecting on the success and failures of the actions and experiments carried out. The M&E includes a 'mid-season evaluation' and the end of season evaluation, leading towards planning for the next season.

Mid-season evaluation

As the title implies, farmers with the help of extension staff, organize an evaluation in the middle of the agricultural season. During this mid-season evaluation, all farmers in the community are invited to go around the fields. The objectives are to:

- Share the knowledge and experiences gained through trying out among farmers;
- Build confidence through presentation; and
- Encourage more farmer-to-farmer extension.

At the end of these visits the farmers decide which techniques do and do not merit further research and/or promotion. Matrix ranking is a good technique for this purpose. Farmers' own criteria are used in ranking. Farmer evaluation is very important as it reveals their knowledge and criteria, often not spoken out in group meetings. For the technologies which are ready for promotion, fact sheets can be written, which describes and summarizes the experience gained. The extension worker multiplies these fact sheets and distributes them to the farmers involved and to the other farmers.

Process review, self evaluation and planning

The process occurs a few months (2–3 normally) prior to the next season. This workshop reviews the whole process, assessing it against the planned activities and the indicators of success identified during the planning process. The group also analyses the reasons for success and failure. The community also uses this opportunity to plan for the next cycle. The whole process repeats itself during each cycle.

5.11.1 Community mobilization

Community mobilization is a process whereby a group of people have transcended their differences to meet on equal terms in order to facilitate a participatory decision-making process. In other words, it can be viewed as a process which begins a dialogue among members of the community to determine who, what, and how issues are decided, and also to provide an avenue for everyone to participate in decisions that affect their lives.

Topuridze (2006) defined community mobilization as the process of stimulating, encouraging and guiding members of the community to bring about community development. Some of the common factors that bind individuals to their communities or that are found in common among individuals in the community are: beliefs and values, language, territory, religion, culture and occupations.

In any community, the most valuable resources are individuals living in the community because they can make decisions about the development of the village. Cooperation among community people

is important to develop the community's self-sufficiency and self-reliance. The community has an important role to identify and use available resources in the village, and to plan and act accordingly. Where there is a mechanism of local self-government, important decisions are usually made at the local level by the local people themselves.

Table 5.8. *Steps and tools in implementing PEA*

Steps	Tools
Entering the community and building trust: Information meeting	– Group discussions
Identifying and supporting effective organizations: Institutional survey	– Individual, informal interviews using guidelines, Venn diagrams
Feedback to the community: Community meeting	– Group discussion – Venn diagrams
Raising awareness in the whole community: Community workshop	– Group discussions – Role plays
Identifying community needs: Needs survey community workshop	– Group and individual discussions, informal interviews, field observations, wealth ranking
Prioritizing problems and needs	– Ranking methods – Group discussions
Searching solutions	– Group and plenary discussions
Mandating local institutions	– Plenary discussion
Action planning workshop	– Group discussions, time plan of action
Implementation	– Experimentation – Visits – Methods demonstration
Mid-season evaluation of new techniques	– Field days – Field visits and discussions
Process review, self-evaluation and planning	– Workshops – Participatory evaluation and impact monitoring tools

Source: AGRITEX (1998).

Community mobilization includes proper management of resources, which is the best possible way for the development of the community. In community mobilization people plan and do things. They take charge, transforming their community and their lives. Community mobilization allows people in the community to:

- Identify needs and promote community interests;
- Promote good leadership and democratic decision-making;
- Identify specific groups for undertaking specific problems;
- Identify all the available resources in the community;
- Plan the best use of the available resources; and
- Enable the community to better govern itself.

Facilitators of community mobilization can inform and guide the learners and other members of the community, create a link between the community and other development programs. As an outsider, the facilitator can only be a catalyst and stimulant to the community development process. As a facilitator, one can inform and guide the learners and other members of the community. The key role is that of a link between the community and other development programs.

Purpose of community mobilization

Community mobilization is seen as a means of achieving broad community participation and effort. Through this, it is suggested that the living conditions, facilities and services of the community will improve, along with the empowerment of the community. Community mobilization is necessary in socially disorganized communities. Social disorganization may be characterized by the inability of legitimate institutions such as home, school and employment, to adequately socialize the community. Both local and federal interests must be mobilized for the development of collaborative community and inter-agency activities directed at the control and reduction the community problem. In times of restricted local community resources, agency consortium efforts are essential. These should include the full and productive use of local, state and federal resources; application of moral and political pressures; and participation by local citizenry.

Community mobilization approach

The community mobilization approach builds on the community's capacities, skills and assets, instead of the community's problems. The situation will vary from community to community; nevertheless, there are common elements and problems. Participation is a key element of mobilization and good mobilization ensures a high level of participation in resource identification, decision-making, prioritizing problems and finding creative solutions to these problems. Everyone who has worked in community mobilization agrees that the beginning of the process is quite challenging.

It should be remembered that the community is full of possibilities and creative ideas. Often, many of the capacities in a community are not recognized. One of the main tasks of a mobilizer is to help the community find these assets and ideas and build relationships within the community to enable the mobilization and utilization of these assets.

It is very difficult to change the behaviour of people who have never been required or asked to participate in the decision-making process, regardless of their education or social status, even if these decisions directly affected their daily life. The techniques used to overcome this problem include: patiently work with the community, trying to show the benefit of participation; making cross visits to successful community projects, thereby effectively demonstrating possible success; and slowly involving more and more members of the community into the process.

Guiding principles

Community mobilization is guided by a number of principles. These include:

- Changing community-level behaviours requires community mobilization;
- Communities are social, rather than geographic entities, although the two often coincide;
- Communities can learn to monitor and take control of their own problems;
- Communities may be mobilized to address a particular problem in a number of different ways depending upon the problem under consideration and the context;
- Community programs should be designed from the outset to be scaled up;
- When working with promoters/facilitators, it is best not to overload them but encourage them to take interest with each other's work and specialize in certain activities; and
- It is important to strengthen community linkages to the rest of the R&D system.

Phases of community mobilization

Phase 1: Community assessment which is about gathering information on attitudes and beliefs about the problem at hand and starting to building relationships with community members and professional sectors.

Phase 2: Raising awareness which is about increasing the awareness about the problem, including why it happens and its negative consequences for the community as a whole.

Phase 3: Building networks which is about encouraging and supporting general community members and various professional sectors to begin considering action and changes that can solve the problem. Community members can come together to strengthen individual and group efforts to do this.

Phase 4: Integrating action which is about taking action against the problem.

Phase 5: Consolidating efforts which is about strengthening actions and activities to prevent the problem to ensure sustainability, continued growth and progress.

At the end, community members assess the performance and incorporate the lessons learned into future community action planning processes.

5.11.2 Steps in organizing communities and farmer organizations

The various generic steps involved in organizing communities are discussed in the following sections.

Step 1: Understanding the village community

Enter the community with an open mind and understand the community structure, its power structure, problems; its policies, groups and past experiences as well as opportunities for development. Useful tools are village walks, key informant interviews and participation in community meetings. Both secondary as well as primary data are relevant. Care should be taken to understand all strata including the poor, marginal farmers and women.

Understanding the ownership of community resource and people's attitudes, knowledge and skills in the development of agricultural production is essential. A better understanding of the situation can be obtained by collecting both qualitative and quantitative information on the levels of income, productivity, costs of cultivation, postharvest losses, output utilization and the likelihood of making significant improvements to each of these factors.

An understanding of the characteristics of the community and local organizational structures are crucial for effective community mobilization. In a typical community, a whole range of organizations operate: formal and informal, traditional and modern; indigenous or externally established. All these have different functions, be they productive, social, religious or otherwise. It is often through these organizations that demand is expressed, participatory processes organized and development services delivered. Some of the most active organizations are informal. Very often community based organizations are built on traditional structures.

Step 2: Identifying potential leaders

Identify the leaders of the village/community and opinion leaders whose views on agriculture have influence on their friends and community leaders. Opinion leaders exist in each socioeconomic strata of the community and it is important to ensure that we capture this reality.

It is important to be sensitive to the leadership structures operating in that culture and be aware of the knowledge and skills needed to be a successful leader of a community/FOs.

Step 3: Seeking cooperation from leaders and other agencies

Talk to the identified leaders on general agricultural development and seek their ideas about FOs. It is also useful to seek cooperation from government agencies and others such as NGOs. A number of key questions can be addressed at this stage.

- Does the community have an FO?
- If not, is there a need for such an organization?
- If the community has an FO, what is its structure and history of performance?
- How could the FO play a role in village or community development?

Take this opportunity to explain how FOs in other communities have helped development. It is important to provide facts and figures to convince potential leaders of the possibilities and approaches for increasing the income and livelihood of the sizable number of farmers and for contributing to the economic development of the region. It is important to get the support of the leaders and also encourage the groups to discuss among themselves about the pros and cons of forming FO in the community.

Step 4: Calling community meetings

The extension agent as facilitator can help local leaders to call for community meetings to discuss the need for and the role of FOs in agricultural development. FO leaders from neighbouring villages or successful organizations can be invited to speak at these meetings. It may also be useful to organize separate meetings for different sections of the community, i.e. from different socioeconomic strata, as they might be more comfortable and it might better serve their specific needs. Prospective members need to be convinced that everyone benefits in proportion to his or her contributions, not just the big or well to do farmers. Having more than one FO in a village is perfectly acceptable.

Step 5: Nominating core group leaders to develop the FO

From the community meetings, core group leaders are elected or nominated to design the FOs with further community consultation. This step is very crucial as it may significantly contribute to the success or failure of the FO. Preferably these potential leaders should command respect and be from the farming households. Farmers in central Ethiopian highlands considered dedication, facilitation capacity and respectfulness as major criteria while electing their chairman and secretary (Mekonnen et al. 2005).

Step 6: Developing an organizational structure for the FO

At this stage the extension agent/facilitator can help the core group of leaders in developing an organizational structure for their FO. The core group should think about the appropriate organizational structure, composition and working rules for the efficient management of the organization. An understanding of the various type of FOs is useful to facilitate this process.

Leaders should secure the relevant guidelines of other FOs and study them carefully, and discuss how they can fit into their community needs. Based on this understanding, taking into consideration their own circumstances, leaders should then draw up a tentative organizational structure and working rules for their FO. It is important to ensure that the structure serve the functions.

Decisions must be made on the following:

- Should they be commodity based or resource based? Cooperative or group? Formal or informal?
- Should they be multipurpose?
- Should there be one FO for the entire village, or several to cater the needs of special interest groups?
- Should they have subgroups and an advisory committee?

It is important to describe the roles, responsibilities, rewards and punishments for the people who perform the various tasks in the FO. At this stage the extension person/facilitator should as far as possible, play a passive role (but guide the process) because the leaders are the ones who are building the FO. The NGOs also may share their experience and help leaders to develop an organizational structure.

A common failure in working with local groups is to create the institutional structure without paying adequate attention to the capability knowledge and technical skills the groups will require.

Step 7: Developing the FOs Management through education and action learning

An essential part of community empowerment is to help educate the leaders and members in management principles covering planning, implementing and monitoring their projects and programs. The empowerment methods that may be useful at this stage are summarized in Box 5.4.

Box 5.4. Empowerment methods

- *Educating.* Organize formal and informal learning activities.
- *Leading.* Help the leaders lead and learn from their actions as a team.
- *Mentoring and supporting.* Help the members initially by mentoring or supporting them in their planning and implementation stages.
- *Providing.* Obtain the services of other stakeholders, FOs, and extension workers in providing various services to nurture the FO in the early stages of development.
- *Structuring.* Help the FO to structure its meetings and various participative planning activities and to learn from their experience through reflection.
- *Actualizing.* Help them to reflect on the process of managing their FO. Learning by doing can help them in self-actualization.

Source: Chamala and Shingi (1997).

Training community organization can empower them to better identify and prioritize their needs and develop strategies to meet them and sustain their development efforts once outside assistance is withdrawn.

Step 8: Gearing up for action

In this step, FOs develop and examine their action plans, and task groups are set up to mobilize human and financial resources. This is the stage to start considering the timing, scale and possible extension and research input of the FO.

Step 9: Implementing selected projects

In this step the extension agent/facilitator can help FO leaders implement the projects chosen. The following process may assist in the effective and efficient implementation:

- Secure resources and allocate tasks;
- Develop a calendar of activities to achieve the goals and assign clear responsibilities;
- Develop monitoring processes for reflecting an events and activities regularly, either formally or informally;
- Establish a mechanism for committee members to meet to discuss actions periodically and report to general members; regularly keep them informed and involved;
- Carefully record the lessons learned.

Step 10: Monitoring and evaluating progress

It is important for the group to reflect on their activities frequently so that they can learn and improve their management skills. It is important to take timely and appropriate action against any negative influences. This monitoring or reflection processes help structure FOs and avoid self defeating problems. Learning organizations are created through collective reflection and openness on financial and other managerial matters. Monitoring should be viewed as an internal management tool and evaluation should focus on aspects such as performance (effectiveness), relevance, efficiency and impact on the livelihood and wellbeing. The factors influencing community group organization are summarized in Box 5.5.

Once the groups have become skilled in tasks required for their participation in the project activities, they can go on to undertake other development activities on their own.

Factors influencing participation in FOs or CBOs

Different factors affect the participation of community members in FOs or CBOs. Some of these are:

- The degree of farmers' dependence on the outputs of the organized activity;
- The degree of certainty of the availability of these outputs;
- The extent to which outputs will be available only as a result of collective action;
- The extent to which the rewards associated with the collective action will be distributed equitably;
- The extent of availability of rewards within a reasonable time frame;
- The extent to which the rewards are commensurate with the costs associated with continued participation (Shingi and Bluhm 1987).

Limitations to community mobilization

- Lack of expertise amongst the community to facilitate such organization;
- Unwillingness of the community as a whole to give up individual interests to form broader cooperative/groups;
- Extreme shortage of available resources to facilitate the mobilization process; and
- The fact that the process of community mobilization is time consuming and requires a lot of patience.

Lessons learned

A number of lessons are learned based on the past efforts of community mobilization initiatives. These are:

Box 5.5. Factors influencing community group effectiveness

Group (FO) internal factors.

At least ten factors are identified under this category:

1. Group composition
2. Group structure and size
3. Group atmosphere
4. Cohesion
5. Group standards and norms
6. Leadership styles
7. Balance between group maintenance needs, individual needs, and task needs
8. Level of 'group think' characteristics in the group
9. Development phase of the group
10. Group culture: empowering or controlling or a balance

Service agency factors

Government and nongovernmental agencies can influence the effectiveness:

1. Technical capabilities of extension staff
2. Staff's 'people skills' in managing groups
3. Staff attitudes and commitment to groups
4. Types of planning methods used: directive or participative, top down or bottom up, or balance of methods to maximize participation
5. Means or ends distinction: some groups are formed as means for development, while others are formed to harvest government subsidies. A group could get help, but it needs to mobilize its own resources
6. Support for field extension officers

Community factors

1. Groups and organizations are part of the community in which they exist. Hence the community influences a group's success

- *Community mobilization is a complex yet possible undertaking.* Activists must recognize that comprehensive solutions need to be sought if meaningful impact is to occur. Breaking down the process into more manageable steps allows for more systematic and thoughtful implementation.
- *Programs must move beyond raising awareness and help individuals and communities make practical change.* Many programs begin and end with raising awareness, yet we know that putting messages into the community or at individuals is not enough to change behaviour. It is essential to help individuals and communities move through a process of change.
- *Team up with other organizations.* Many organizations do not have the capacity to implement multifaceted programs and the result can be many uncoordinated efforts working with specific target groups. If NGOs can collaborate with sister agencies that have different strengths and capacities, more holistic programming can be implemented.
- *Mobilization efforts must be rooted in the experiences of and lead by community members.* NGOs can play an important coordinating and facilitative role in community mobilization, yet the effort itself must be owned and ultimately sustained by community members. Activist NGOs can consider playing a catalytic role of inspiring and supporting others to take action.

- *Aim for a comprehensive response.* Avoid narrow approaches of working only with one or two stakeholder groups. Connect with the bigger picture of what needs to happen in the community and then plan for the long term.
- *Primary prevention is crucial for long-term change.* Addressing the root causes of the problem is the essence of primary prevention. In order to affect social change, it is important that programs begin to systematically address deeply held beliefs and attitudes that underpin the problem.
- *Make it personal.* Working on different problems requires cutting to the core of what individuals and communities fundamentally believe. Overall work must encourage personal reflection and action leading to changes in the personal and professional lives of the community members.
- *Reach out to a cross-section of community members.* Community mobilization requires involvement and action on the part of a wide range of community members: women and men, elders and youth, professionals and non-professionals. Effective programs attempt to engage all these groups through various strategies.
- *Construct a benefits-based approach.* Promote the benefits of solving the problem by explaining to community members the advantages of solving the problem.
- *Present the problem as a community problem, not as a problem of a specific group of the community.* This avoids marginalizing the specific group of the community and places responsibility squarely on the community as a whole.
- *Recognize the importance of local leaders.* Formal and non-formal leadership structures in the community carry great influence and power. The support and action of these leaders can greatly facilitate positive change.

5.12 Positive deviance and steps in adopting the approach

Chapter one described the new paradigm of Positive Deviance (PD) which postulates that solutions to the community's problem can be found within the community. This section describes the steps to be followed in adopting this approach.

Step 1: Do not presume that you have the answer

Be ready to listen and not to talk. Key informants may be very useful in identifying the positive deviants.

Step 2: Do not think of it as a dinner party

Make sure not to mix people from different social groups. Everyone in the group that you want to help change must identify with the others in the group. Everyone must face the same challenges and rely on the same set of resources to come up with answers. If the group members do not see themselves as working on identical challenges with identical set of resources, then positive deviance will not work.

A solution has to be repeatable. If you are going outside where things are so culturally different, then it is just another way to impose best practices, and you are not using the positive deviance.

Step 3: Let them do it themselves

Set up a situation in which people—including those who need to change the way they operate—can discover, on their own a better way to do things. Raise questions, but let the group come up with the answers on their own. Establish research guidelines that isolate and analyse the behaviour of positive deviants inside the group itself—and that highlights the superior results that the study achieves.

Step 4: Identify conventional wisdom

Before you can recognize how the positive deviants stray from conventional wisdom, you first have to understand clearly what the accepted behaviour is. Establish what it is that most group members do. Clarify the conventional wisdom of the average and of the majority.

Step 5: Identify and analyse the deviants

As one tracks down how people in the group go about their tasks, and begin to list the behaviours that they all have in common, the positive deviant will naturally emerge. If the development practitioner helps the community identify the positive deviants, then they will not feel that an outside solution has been imposed on them. They will have discovered a new way of doing things themselves, making it their own discovery. Analyse and list the set of behaviours that the deviants have in common. Single out exactly what makes them successful.

Step 6: Let the deviants adopt deviations on their own

Design an intervention that requires and enables people to access and to act on these new premises. You enable people to practice a new behaviour and not merely sit in class learning about it. It is all about changing behaviour. The key here is 'Do not teach the knowledge—encourage new behaviour' (Fast Company 2005). Let the people who have discovered the deviations spread the word in their group. We need to provide incentives for it.

Step 7: Track results and publicize them

Post the results and show they were achieved, and let the other groups develop their own curiosity about them. It is important to go back to the community periodically and observe how different groups have changed, and track the results quantitatively to show how positive deviance works.

Step 8: Repeat step one through seven

Make the whole process cyclical. Once people discover effective ways to deviate from the norm, and once those methods have become common practice, it is time to do another study to find out how the best performers in the group are operating now. The chances are that they have discovered new deviations from the new norm.

The key principle is: Discover original local answers to the problem, and then give everyone access to the secrets.

References

- AGRITEX (Department of Agricultural, Technical and Extension Services). 1998. *Learning together through participatory extension: A guide to an approach developed in Zimbabwe*. AGRITEX, Harare, Zimbabwe.
- Anandajayasekeram P and Dixon J. 1998. Evolving methodological considerations, empowerment and capacity building in the farming systems approach. An invited paper presented at the 6th annual conference of the Southern African Association of Farming System Research and Extension, Lusaka, Zambia, 2–4 February 1998.
- Anandajayasekeram P, Torkelsson A and Dixon J. 2002 *Emerging participatory approaches to technology development and transfer. What is new?* Occasional paper, FARMESA, Harare, Zimbabwe.
- Anyaegbunan C, Paulo M and Titus M. 1998. Participatory rural communication appraisal: Starting with the people. SADC (Southern African Development Community), Harare, Zimbabwe; and Center of Communication for Development and FAO (Food and Agriculture Organization of the United Nations), Rome, Italy. 195 pp.

- Bianchi RR and Kossoudji SA. 2001. *Interest groups and organizations as stakeholders*. Social Development Papers 35.
- Biggs SD and Matsuert. 2004. *Strengthening poverty reduction programmes using an actor-oriented approach: Examples from natural resources innovation systems*. Network Paper 134.
- Bless C and Higson-Smith C. 1995. *Fundamentals of social research methods. An African perspective*. Kenwyn, Juta, South Africa.
- Burkey S. 1993. *People first: A guide to self-reliant participatory rural development*. Zed, London, UK.
- Carruthers I and Chambers R. 1981. Rapid appraisal for rural development. *Agricultural Administration* 8(6):407–422.
- Chamala S and Shingi PM. 1997. Establishing and strengthening farmer organizations. In: Swanson B (ed), *Improving agricultural extension: A reference manual*. FAO (Food and Agriculture Organization of the United Nations), Rome, Italy.
- Chambers R. 1993. *Challenging the profession—Frontiers for rural development*. Intermediate Technology Publications, London, UK.
- Chambers R. 1997. *Whose reality counts? Putting the first last*. IIED, London, UK
- Conway GR. 1986. *An introduction to agroecosystem analysis. Prepared for the international course for development oriented research in agriculture*. Centre for Environmental Technology, Imperial College of Science and Technology, London, UK.
- Conway G. 1998. *The Doubly Green Revolution: Food for all in the 21st century*. Penguin Books, New York, USA.
- Engel P and Salomon M. 1997. Facilitating innovation for development. A RAAKS resource box.
- Farm Programme. 1998. *Participatory assessment and planning (PAP) process for community planning and natural resources management: A training manual*. FAO (Food and Agriculture Organization of the United Nations), Rome, Italy.
- Fast Company. 2005. Positive Deviant. <http://www.fastcompany.com/magazine/41/sternin.html>
- Galpin M, Dorward P and Shepherd D. 2000. *Participatory farm management for agricultural research and extension: A training manual*. University of Reading, UK.
- Matata JB, Anandajayasekeram P, Kiriro FN, Wandera EO and Dixon J. 2001. Farming systems approach to technology development and transfer. A source book, FARMESA, Harare, Zimbabwe.
- Mekonnen Kindu, Tilahun Amede, Berhane Kidane and Meharie Alebachew. 2005. Experiences of AHI in participatory technology development and dissemination: The case of tree species evaluation and dissemination at Galessa, Ethiopia. In: Farmer research group: Concepts and practices. Proceedings of a workshop organized by EARO, OARI and JICA. MARC, Melkassa, Ethiopia.
- Mele PV and Zakaria AKM. 2002. *The innovation tree: New PRA tool to reveal socio-psychological factors influencing the innovation, adoption and diffusion process*. Rural Development Academy, Bogra, Bangladesh.
- Mukherjee N. 1997. Participatory appraisal of natural resources. Studies in rural participation number 3. Concept Publishing Company, New Delhi, India.
- Röling MC NG. 1983. Agricultural knowledge: Its development, transformation, promotion and utilization; Issues for information consolidation. Paper for third expert working group on information, analysis and consolidation. UNESCO/UNISIST, Kuala Lumpur, Malaysia, 12–16 September.
- Shingi PM and Bluhm LH. 1987. Participation in irrigation projects: Changing patterns in northwestern India. In: Schwarzweller HK (ed), *Research in rural sociology and development*. Volume 3. Jai Press, Greenwich, USA. pp. 65–84.
- Topuridze N. 2006. Mobilization insights from Georgia, USA.
- Wetmore SB and Theron F. 1998. Community development and research: Participatory learning and action—A development strategy in itself. *Development Southern Africa* 13(1):Autumn 1998.

6. Progress and process monitoring, evaluation and impact assessment

6.1 Monitoring, evaluation and impact assessment

6.2 Participatory evaluation

6.3 Participatory Impact Monitoring (PIM)

6.4 Process monitoring

6.5 Outcome mapping

6.1 Monitoring, evaluation and impact assessment

The process of monitoring, evaluation (M&E) and impact assessment is the primary means of collecting and analysing information, and is thus essential for good project management. In order to be used in a more positive manner, management and staff must have a common understanding of the importance of the process involved, and the contribution it can make to achieve the objectives of the technology development and transfer. To be effective, monitoring, evaluation and impact assessment should be participatory, and should be an integral part of project planning and implementation. In this chapter the concepts of monitoring, evaluation, and impact assessment are defined and a framework for comprehensive impact assessment is developed. The emphasis is on the process, and not on individual project M&E.

6.1.1 Monitoring

Monitoring is a continuous assessment of both the functioning of the project activities in the context of implementation schedules and of the use of project inputs by the targeted population in the context of design expectations. The goals of monitoring are:

- To ensure that inputs, work schedules and outputs are proceeding according to plan, i.e. that project implementation is on course;
- To provide record of input use, activities and results; and
- Early warning of deviations from initial goals and expected outcome.

Thus, monitoring is a process which systematically and critically observes events connected to a project in order to control the activities and adapt them to the conditions. Key steps in the monitoring process are:

1. Recording data on key indicators, largely available from existing sources, such as time sheets, budget reports, supply records;
2. Data analysis performed at each functional level management. This is important to assume the flow of both resources and technical information through the system;
3. Reporting, often through quarterly and annual progress reports, oral presentations organized by project staff;

4. Information storage, whether manual or computerized, should be accessible to managers at different levels of the system.

Monitoring is an internal project management tool. Integrating monitoring into implementation increases the accuracy of the collected information, reduces the cost of acquisition, increases the focus (alertness) of the participating scientists and reduces the time lag for management corrections. Therefore, the emphasis is placed on simple methods. The various objectives of an M&E system are summarized in Box 6.1.

In the context of agricultural R&D, monitoring includes the periodic recording, analysis, reporting, and storage of data about key research and extension indicators. Data includes physical and financial information, details of inputs and services provided to beneficiaries, and data obtained from surveys and other recording mechanisms. Monitoring primarily provides information on project performance and gives signals on whether an activity is proceeding according to the plan. Monitoring is essential for evaluation.

Box 6.1. The objectives of M&E

Checking implementation

- Record inputs, activities and outputs
- Identify deviations from work plans
- Identify constraints/bottlenecks

Assessing performance, quality and relevance:

- Overall efficiency (cost effectiveness)
- Overall effectiveness (achieving objectives)
- Suitability of new methods and technologies under testing at the field sites (relevancy)
- Long-term impact (contribution to development objective)

Reflecting and learning

- Learning from achievements and mistakes
- Increase capacity to perform better in the future and
- Take corrective action

Communication

- Share progress and results with others

It can also provide information on the socioeconomic indicators for *ex post* evaluation. One could simultaneously monitor the resource use, i.e. funds and personnel, as well as the process. Monitoring of the process may be accomplished through *inter alia* review meetings and periodic seminars. This permits management to compare the progress of work against planned activities, detect deviations, identify bottlenecks and take corrective action while research is in progress. Monitoring and Evaluation are closely linked (Figure 6.1) and are an integral part of project cycle (Figure 6.2).

6.1.2 Evaluation

Any assessment, appraisal, analysis or reviews is in a broad sense evaluative. Evaluations result in a set of recommendations, which may address issues of planning, such as a shift in program objectives

or contents or program implementation. Information from an evaluation is used in the management of technical programs, personnel and financial resources.

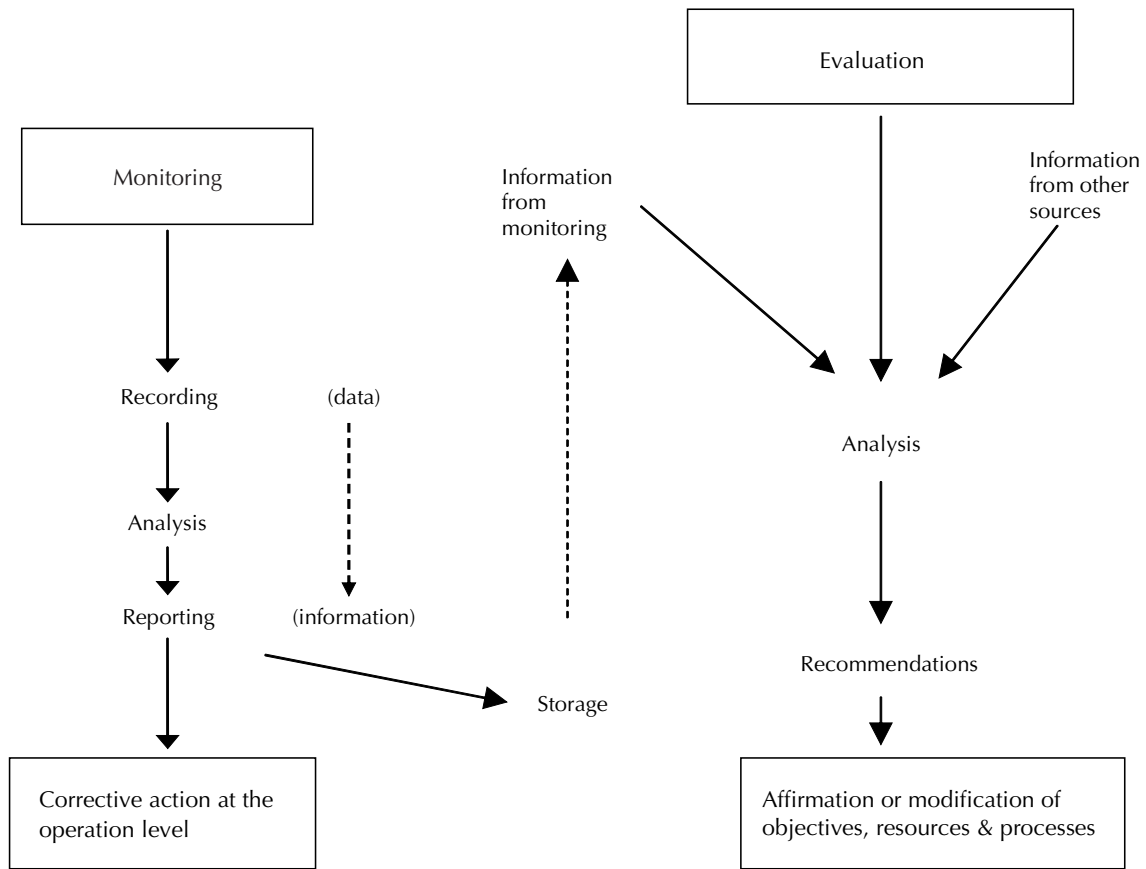


Figure 6.1. The relationship between monitoring and evaluation.

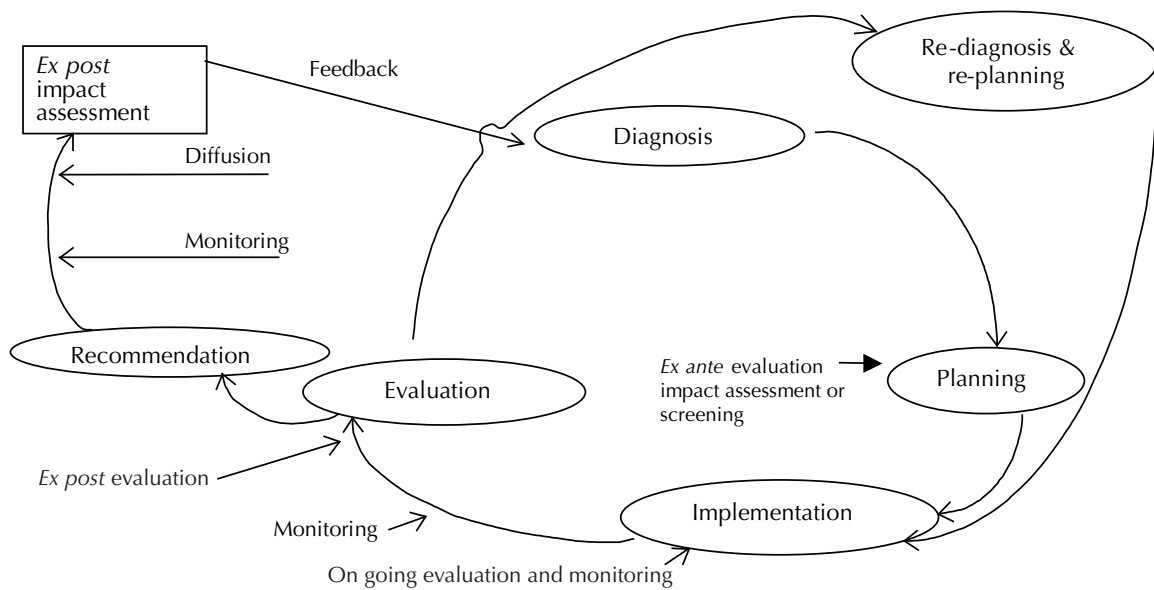


Figure 6.2. M&E and its place in the project cycle.

Evaluation in general addresses four important aspects of the program, namely: performance, quality, relevance and eventual impact.

- Performance compares achievements with expected output. It is primarily concerned with the use of resources and the time lines of the activity and is determined mostly through monitoring and on-going evaluation. However, assessing the success or failure of research goes far beyond determining whether resources were used according to plan or activities were carried out on time.
- Quality deals with the adherence to accepted standards of scientific work and precision. The quality of research is determined almost exclusively through some form of peer/expert review.
- Relevance of research at each level of the research investigates on research relevance to objectives, which ultimately reflect on the developmental objectives. Relevance is closely related to the problem being addressed and the target group under consideration. Relevance is primarily assessed through peer or expert review and beneficiary assessment.
- Impact deals with the effect of the research output on the ultimate users often referred to as 'people level impact'.

6.1.3 Types of evaluation

Evaluations are most often categorized according to when they occur in the project cycle and their purpose. Some of the common types of evaluation are described below.

Ex ante evaluation

Ex ante evaluation is a research planning process which includes a comprehensive analysis of the potential impact of alternative activities before implementation. As the name implies the evaluation is done prior to the initiation of the project. At this stage not too much is known about the proposed project and estimates of costs and benefits are sketchy and the values assigned to them are only 'ball-park' figures based on informal judgment.

Methods used are peer or expert reviews using checklists, scoring models, and even cost-benefit analysis. To make *ex ante* evaluation more effective, there should be participation from different disciplines and more comprehensive criteria must be applied. Through *ex ante* evaluation, one could define the baseline against which progress will be measured, set targets, and state the assumptions used in making the projections. The indicators to be monitored should also be specified in order to assist *ex post* evaluation.

On-going evaluation

On-going evaluations that are conducted throughout the technology development and transfer process are more useful for management than *ex ante* and *ex post* assessments. Here on-going activities are reviewed at critical stages to determine if they should be continued, modified or aborted. They are used to analyse the use of resources, the quality of research and extension and the continuing relevance of research and extension programs and projects. On-going evaluation is often conducted through peer reviews. On-going evaluation addresses problems associated with the day-to-day management of interventions and also can indicate the need for changes in project objectives and targets.

Monitoring is fundamental for on-going evaluation. It primarily tracks down the provision and delivery of inputs and services, the generation of information on the ability and deployment of staff, infrastructure, equipment, supplies, services and funds for projects within a program. In on-farm research, the on-

going evaluation is used to obtain feedback from the target group; and is largely accomplished through a series of meetings at the site with peers, farmers, extension staff and NGOs.

Ex post evaluation (immediately after the completion)

An *ex post* evaluation, or final evaluation, assesses the project's performance, quality, and relevance immediately after the project completion. It attempts to measure the effectiveness and efficiency of a completed activity and includes an analysis of the original assumptions used in planning. A good *ex post* evaluation is linked to *ex ante* evaluation, and can best be conducted where a baseline has been originally defined, targets have been projected, and data has been collected on important indicators.

Ex post evaluation analyses the project from beginning to end, determining whether project objectives were attained, causes for discrepancies, costs, and the quality and relevance of the activities. *Ex post* evaluation often considers such aspects as the cost effectiveness, its potential relevance to national development goals, the response of the R&D to an urgent and important problem, the acceptance of the results by farmers (end users) and development agencies, and the contribution of the research and extension to innovation.

The methods typically used for *ex post* evaluation are statistical evaluation, economic evaluation, agronomic assessment and farmers/community assessment. Advanced preparation for *ex post* evaluation should include precise plans on documentation needed, people to interview and sites to visit. Some supplementary information may need to be gathered through surveys or interviews. Most evaluations use a blend of interviews, field visits, observations and report writing. *Ex post* evaluation also tries to clarify the internal and external factors affecting the outcome of the project.

Ex post evaluation can provide important insights into the R&D process and provide a basis for comparing alternative organizational and methodological approaches. The lessons learned could be systematically incorporated into subsequent evaluations making the processes much more relevant and efficient.

Impact evaluation

This is a form of *ex post* evaluation. Impact evaluation attempts to determine the extent to which Technology and Development Transfer (TDT) programs have contributed to larger development goals, such as increased farm production, or improved food security, poverty alleviation etc. Typically, it is conducted several years after the results have been released making it less useful as a management tool than the other types of evaluation. *Ex post* impact assessments are often used to convince policymakers to allocate more resources to research and extension. If the project and program evaluations are to be used to support impact evaluations, this should be considered during *ex ante* evaluations and the necessary baseline data and an M&E system should be set up in advance to serve this purpose.

Impact evaluation must distinguish between the contributions various sectors like research, extension services, agricultural inputs, adequate infrastructure and favourable marketing and pricing policies make to national development. The key concepts in *ex post* impact assessments are causality, attribution and incrementality. *Ex post* impact assessments usually require extensive and often expensive data collection and a thorough analysis of socioeconomic factors. The results of impact evaluations have broad implications for future priority setting, not only for research, but also for development support services. The types of impacts and methods used are discussed in the following sections.

6.1.4 Impact

The term 'impact' means different things to different people. In discussing the impact of any research and extension program, one can identify two broad categories of interpretations (Anderson and Herdt 1990). In the first category, some people look at the direct output of the activity and call this an impact, e.g. a variety, a breed, or a set of recommendations resulting from a research activity or a training activity conducted. The second category goes beyond the direct product and tries to study the effects of this product on the ultimate users, i.e. the so-called people level impact. The people level impact looks at how fit the program is within the overall R&D to discover facts (research) that have practical beneficial application (development) to the society. Impact begins to occur only when there is a behavioural change among the potential users. This second type of impact deals with the actual adoption of the research output and subsequent effects on production, income, environment and/or whatever the development objectives may be.

The people level impact of any research activity cannot be assessed without information about the number of users (extent) and the degree of adoption (intensity) of improved techniques, and the incremental effects of these techniques on production costs and output. The adoption of any technology is determined by several factors, which are not part of the original research and extension activity.

In any comprehensive impact assessment, there is therefore a need to differentiate between the research extension results and the contributions of research and extension to development, i.e. the people level impact, and both aspects should be addressed. Impact assessment is directed at establishing, with certainty, whether or not an intervention is producing its intended effect. A program that has positive impact is one that achieves some positive movement or change in relation to objectives. This implies a set of operationally defined goals and a criterion of success. There is also a need to establish that the outcome is the cause of some specified effort. As such, it is important to demonstrate that the changes observed are a function of the specific interventions and cannot be accounted for in any other way. As pointed out earlier, the three basic principles to be observed in any impact study are causality, attribution, and incrementality.

6.1.5 Impact chain

The typical impact chain starts from the set of inputs and activities of a project/program to the most highly aggregated development results, such as poverty reduction, food security, environmental protection etc. The chain also specifies all the main intermediate steps: the activities of a project, the output, the use that others make of this output, the direct as well as possible indirect effects, and the implications of the use of these outputs on the ultimate beneficiaries—society (see Figure 6.3). The output, outcome, and impact are generally sequentially produced over a period of time and become more difficult to articulate, measure, and attribute as one moves from outputs to impact.

6.1.6 Outputs

This refers to the results of the program activities, i.e. goods and services produced by the set of collaborative activities. In the case of training activities, the outputs may be trained individuals with acquired skills (are able to apply the skills taught), a set of training materials, and/or trained trainers. See Box 6.2 for examples of the types of R&D outputs.

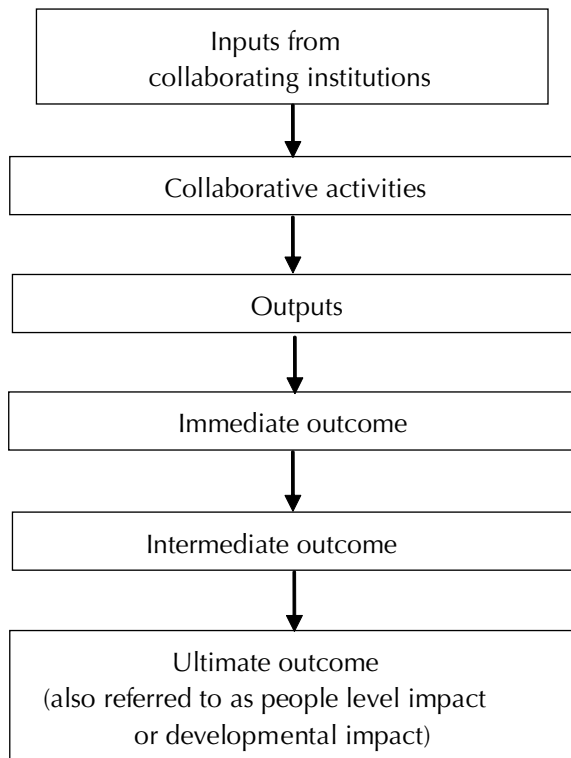


Figure 6.3. *Impact chain.*

Immediate outcome

This refers to the first level effect of the outputs: the observed or documented behavioural changes in those directly affected by program. In the case of training program, how did the training affect the behaviour of the trainee? Did (s)he make any changes in the way of doing business as a result of the training? Did (s)he apply the skills acquired? In the case of research the first immediate outcome may be a change in the recommendations provided by the extension staff or even the behavioural change to use the direct product, i.e. adoption.

Intermediate outcome

This refers to the benefits and changes resulting from the application of the output. In the case of training, what are the effects in the performance of the individual and/or institution as a result of the applications of the skills acquired? In the case of a technology the intermediate outcome may be the effects at the farm/household level, i.e. increased yield, reduction in costs.

In order to bring about an outcome, the program has to change people's behaviour. By trying to identify and then document the changes in attitudes, knowledge, perceptions, and decisions taken by program target groups, which logically link to the outcomes being observed, we can often acquire a good understanding of the actual impact that the program has. Often, immediate and intermediate outcomes can be measured and documented directly. This requires clearly identifying the various clients of the program and the way in which their behaviour is expected to change. If an expected outcome has been observed after the program activity has started up, then this suggests that the program is having an effect. If we can observe these short-term changes, then the logical case for the program's attributions can be enhanced.

Box 6.2. Types of research output

The major outputs of R&D activities may be an improved technology or improved set of information. Both types of output will eventually lead to improving the efficiency of agricultural resources.

Improved technology

On-farm

An improved technology on-farm could comprise of:

- New enterprise, e.g. a new legume crop species;
- Increased production, e.g. a new crop variety;
- Decreased production costs, e.g. a more efficient technology for the application of chemicals;
- Increased quality, e.g. reduced contamination, increased oil content; and
- Reduced risk, e.g. a more stable yielding crop variety.

Off-farm

An improved technology off-farm could comprise of:

- Decreased handling/transport/storage/processing cost;
- Decreased wastage/spoilage; and
- Improved health.

Information

Information can be about the existing technology or the new technology. Both types of information are aimed at improving the returns to research investment. Some examples of improved benefits from information systems are:

- Information on an existing technology which enhances adoption both on-farm and off-farm, i.e. a more rapid adoption and/or a higher level of adoption of existing technology;
- Better management decisions (strategic and tactical) leading to higher profit;
- Better application rates, timing and inputs;
- Improved fertilizer management on sandy soils;
- Quality of research; and institutional changes;
- Reduced risk; and facilitation of other research.

It is worth noting that there is no clear-cut dichotomy between technology and information. For example, a new technology must accompany information at least on how to apply it.

Outcomes are measures of the use that is made of the output by clients and partners. They reflect the value they place on them as intermediate product, which in turn are input in their management decision-making.

Ultimate outcome (impact)

Impact refers to measurable effects of the outputs and outcomes on the well-being of the ultimate beneficiaries of the R&D efforts, namely the poor, the food- and nutrition-insecure, and the environment.

Most socioeconomic impacts and developmental impacts fall under this category. Very often the ultimate outcomes are closely linked to the sectoral/regional/national developmental goals.

Since there is considerable time lag between the realization of outcome and impact, often one could use proxies or partial indicators in terms of assessing the people-level impact. In addition to program output, a number of other factors may contribute to the realization of people-level impact. Thus attribution may be more difficult.

In assessing the outcome and impact, one should focus the analysis on all three levels—individuals (those who are directly involved in the program); organizational level and; people level, i.e. the ultimate beneficiaries. One may complement his/her observation with expert opinion (from people outside the program who are seen as knowledgeable about the program area, the program's impacts, and the environment in which the program operate). If there is documented evidence available (secondary sources such as evaluation reports) about the program output, outcome and impact, they should be collected, analysed and documented. It is important to show evidence for any claims with respect to outcome and impact, as well as indicate where such evidences can be found.

The three basic issues that need to be taken care of in any empirical impact study are causality, attribution and incrementality. It is important to ensure that the impacts measured are as a result of the intervention/collaborative activities. Incrementality refers to any autonomous endogenous changes that would have taken place in the absence of the collaborative activities or intervention. Problems with attribution arise when one believes or is trying to claim that a program has resulted in certain outcomes and there are alternative plausible explanations. Under these circumstances:

- Identify the most likely alternative explanations;
- Present whatever evidence or argument you have to discuss, and where appropriate, discount these alternative explanations; and
- Present whatever evidence there is to support the more likely explanation for the observed outcome.

Addressing attribution problems this way demonstrates that:

- You are aware of the complexity of the situation;
- You acknowledge and understand the other factors at play;
- You are nevertheless concluding (assuming you are) that the most likely explanation for the observed outcome is that the program made a significant contribution.

To sum up, there are four products of concern of collaborative R&D activities: outputs, outcomes, changes in organizational performance, and the final welfare impacts. They are sequentially produced and more difficult to document, articulate, measure, and attribute as one moves from outputs to impacts. Attribution remains one of the methodological challenges in impact assessment studies. This is critical in today's world especially where partnerships and collaborations are an increasing feature. Therefore, as far as possible joint impact of various players should be measured rather than trying to separate the contribution of individual institutions, which may not be feasible in most cases. However, it is important to make sure that the inputs and contribution of all partners are appropriately acknowledged.

Three basic types of impact evaluation are possible: qualitative, quantitative and a mixture of both. Qualitative evaluations describe the process by which the outputs of research and development activities have influenced institutional innovations and the eventual social impacts. It seems that the most appropriate approaches to impact assessment should involve a mixture of both qualitative and

quantitative methods. Retrospective narratives are essential components of the former and indeed provide the basis for quantitative estimates and the related issue of attribution.

6.1.7 Types of impact

Impact studies can be carried out to study the impact of a particular innovation/technology, on a research program, or on a research program plus complementary services (such as extension, marketing etc.). Impacts can also be measured at the individual household level, target population level, as well as national and regional levels (primary sector, or secondary sector, or overall economy). The direct product of an agricultural project/program may be an improved technology (embodied or disembodied), specialized information, or research results (reports, papers and publications). There is general consensus that an agricultural TDT effort in addition to producing the direct product of

Box 6.3. Types of impact

Production Impact

- Yield/productivity gains
- Acreage

Economic Impact — comparison of benefits and costs

- Income
- Rate of returns
- Reduced risk
- Number and type of jobs created or/reduction in employment rates per type
- Distribution of benefits
 - Gender
 - Income group
 - Location
- Changes in resource allocation, e.g. labour patterns
- Nutritional implications

Social/cultural impact (can be positive or negative)

- Changes in status of women
- Changes in the knowledge and skill level of people
- Changes in the health of various groups of people

Environmental impact (can be positive or negative)

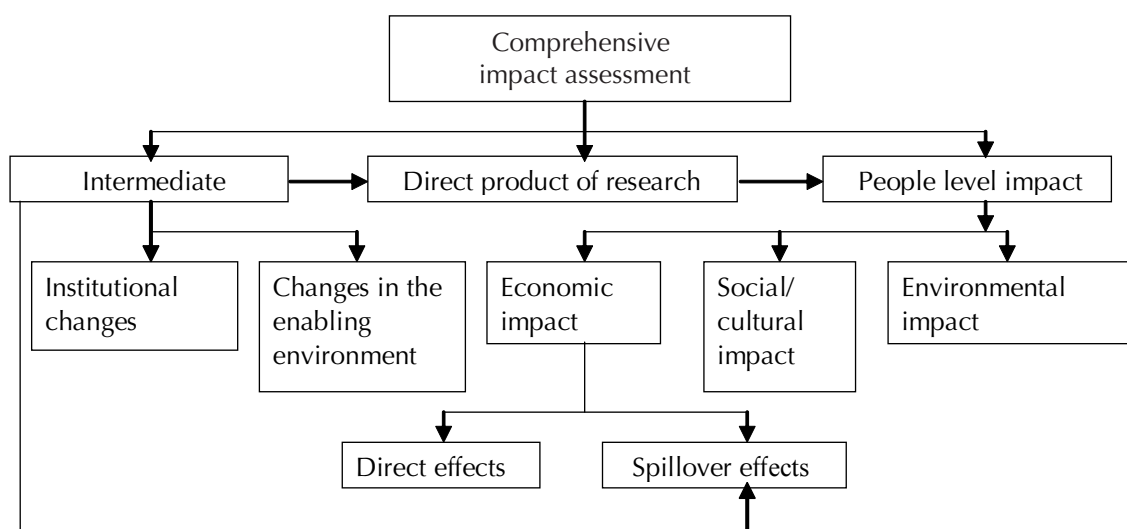
- Air and water pollution
- Soil erosion and sedimentation
- Contamination of soil and water by herbicide or pesticide residues
- Effects on the long-term functioning of biosphere, potential climate change etc.
- Effects on biodiversity

Institutional impact

- Changes in intermediate organizational structures of methods and plans
- Changes in the number and composition of scientists and extension workers
- Changes in the proportion of funds allocated to research and extension
- Changes in the mix of public and private sector participation
- Improvement in interdisciplinary involvement

research could potentially lead to five different types of impacts (see Box 6.3), namely production impact, economic impact, socioeconomic impact, environmental impacts and institutional impact. Institutional impact refers to the effects of TDT efforts on the capacity of the research and extension program to generate and disseminate new production technologies. These different impacts and the appropriate methods to measure them are discussed in the following section.

Based on the previous discussions, there are three broad categories of impact that form part of a comprehensive impact assessment exercise. The first is the direct outcome of the research activities. The second, the intermediate impact which is concerned with the organizational strategies and methods used by researchers and extension workers, and other actors in conducting more effective technology development and transfer. The third is the effects of the direct product(s) on the ultimate beneficiaries. This is the so called people level impact. The people level impact can be economic, socioeconomic, socio-cultural, and/or environmental. The various types of impact are summarized in Figure 6.4.



Source: Anandajayasekaram et al. (1996).
Figure 6.4. Framework for comprehensive impact assessment.

Overview of impact assessment methods

A comprehensive impact assessment should simultaneously assess the various impacts of the TDT. The various techniques and methods used to assess the different types of impact are summarized in Table 6.1 and discussed in the subsequent sections.

6.1.8 Direct product of R&D—effectiveness analysis

The most commonly used approach for assessing the direct product of R&D is known as effectiveness analysis. A useful starting point for effectiveness analysis is the logical framework of the project. The logical framework permits the assessment of the degree to which the activities have made changes in the desired direction. The logical framework itself is a simple matrix that provides a structure for one to specify the components of a program/activity and the logical linkages between the set of means (inputs and activities) and the set of ends (outputs). This logical framework makes the impact assessment process transparent by explicitly stating the underlying assumptions of the analysis.

Table 6.1. *Impact types, techniques and methods used in a comprehensive assessment*

Impact type	Method	Technique
Intermediate impact <ul style="list-style-type: none"> • Institutional changes • Changes in the enabling environment 	Survey, monitoring	Simple comparison/trend analysis
Direct product of research	Effectiveness analysis using logical framework	Simple comparison—target vs. actual
Economic impact (micro, macro, spillovers)	Econometric approach, Surplus approach	Production function, Total factor productivity, Index number methods and derivatives
Socio-cultural impact	Socioeconomic survey/Adoption survey	Comparison over time
Environmental impact	Environmental impact assessment	Various <ul style="list-style-type: none"> • Qualitative • Quantitative

The effectiveness analysis is a simple comparison of these targets to actual or observed performance of the project. Three sets of comparisons are identified in the literature: ‘before’ and ‘after’ comparison (also called historical comparison); ‘with’ and ‘without’ comparison; and ‘target’ vs. ‘achievement’ comparison. The most useful comparison is target vs. achieved. The targets need not be completely achieved for the project to be deemed effective. The movement in the direction of the desired target is evidence of project effectiveness.

Evaluating the impact of intermediate product(s)

The link between the intermediate product and the ultimate economic benefit is not clear and, therefore, tends to be ignored in most impact assessment studies. The evaluation of the intermediate product is made difficult by the fact that the benefits of these products are not easy to quantify. Thus, most studies acknowledge the fact that having the organizational capacity to conduct agricultural TDT is of paramount importance. These studies, however, do not include the benefits in assessment of the impact. The costs that are easy to quantify are usually included. Thus, the assessment of the intermediate product has been a tricky issue. The practice has been to trace the changes in organizational capacity over time using either simple trend analysis or comparisons over time. This requires baseline information on these indicators and careful monitoring. The results from these analyses can be incorporated into the quantitative analysis through a multi-criteria analysis.

People level impact

As pointed out earlier, the people level impact can be economic, socio-cultural, and environmental.

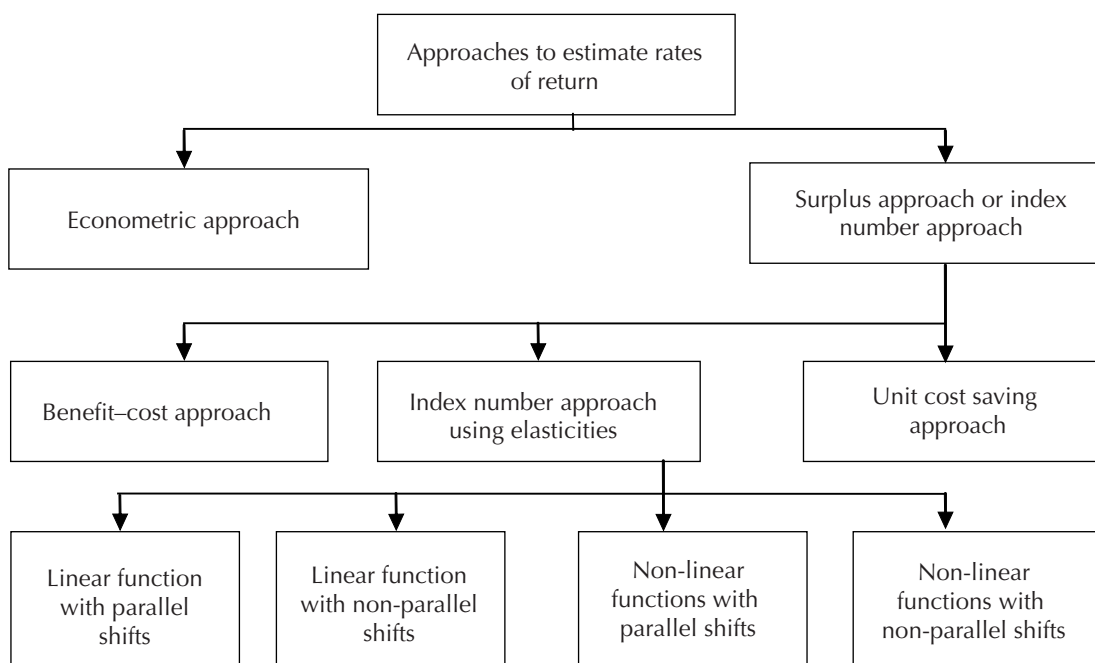
The economic impact

The economic impact of TDT initiatives can be traced through its effect on production and income. The approach used is called efficiency analysis. Efficiency analysis assesses the people level impact by comparing the benefits that society gets from TDT and the costs incurred in conducting TDT programs. The benefits and costs are normally collapsed into a single number, the rate of return (ROR). There are two broad ways of calculating the rate of return to TDT: *ex ante* and *ex post*. The *ex ante* methods

are useful as research planning tools as they aid in the selection of the research portfolio, priority setting and resource allocation. The *ex post* studies are useful for justifying past TDT investments, and demonstrating the payoff of such investments.

The *ex ante* methods for estimating RoR include benefit–cost analysis, simulation models and mathematical programming models. The last two methods are data and skill intensive and, therefore, rarely used.

Ex post methods for RoR estimation can be divided into two broad groups, as shown in Figure 6.5. The econometric method uses the production function in which research and transfer activities are considered inputs and give the marginal rate of return (MRR) to agricultural TDT. The MRR quantifies the returns to the last dollar expended in the research project. To determine the optimal allocation of funds, it is necessary to know the marginal benefit of the last research dollar invested. This is the only method that allows for the separation of the effects of research from those of extension and other support services. However, the data requirements have reduced the extensive use of this method.



Source: Anandajayasekaram et al. (1996).
Figure 6.5. Approaches for estimating rates of return.

The second group of methods is clubbed under the surplus approach. These methods calculate the benefits of TDT as the net change in producer and consumer surplus, employing a partial equilibrium analysis. The different techniques are based on the difference in the assumed nature and elasticities of the supply and demand functions. The benefit–cost approach has various combinations of the nature of the supply shift and the functional form of the supply and demand curves. The cost-saving approach is in between these two approaches, but based on the same theoretical foundation.

These methods calculate the average rate of return (ARR). The average or internal rate of return takes the research expenditure as given and calculates the RoR for the project or program in its entirety. This provides information to assess the success of the project in terms of generating adequate returns.

However, the ARR measure is not always helpful in determining if the allocation of research funding to the project was appropriate. Because of the historic nature of *ex post* evaluation, the results of these studies have mainly been used as political instruments to secure future funding. They demonstrate how efficient past investments were, but not necessarily where research resources should be allocated in the present, or the future. For a detailed description of the various techniques see Anandajayasekeram et al. (1996). For our purposes a simple technique such as a partial budget and cost:benefit framework can be effectively used to estimate RoR of TDT efforts. The different techniques used to estimate the RoR are discussed individually in the subsequent sections.

Socio-cultural impact

Socio-cultural impacts include the effects of research on the attitude, beliefs, resource distribution, status of women, income distribution, nutritional implications etc. of the community. These can be assessed through socioeconomic surveys and careful monitoring. To be cost effective, appropriate socio-cultural questions can be included in adoption survey questionnaires.

Environmental impact

The adoption of modern agricultural technologies has often resulted in external benefits and costs largely through its effects on the environment. For example, the use of fertilizers or pesticides may lead to surface and ground water contamination by toxic chemicals and algae, resulting in significant environmental costs. On the other hand, adoption of minimum tillage technology and herbicides by farmers has probably had environmental benefits in the form of reduced soil erosion and nutrient loss.

The full assessment of environmental quality issues requires complex analysis of physical, biological, social and economic processes. This also leads into some measurement problems. Such a breadth of analysis is likely to be beyond the scope of most agricultural research assessment activities. Nevertheless, some assessment of environmental impact is necessary when evaluating agricultural research, especially where the environmental impact of the application of the research is likely to be significant. In the absence of data required for a thorough analysis, it may still be possible to identify qualitatively the nature of the social benefits and costs, together with the likely gainers and losers.

Multi-criteria analysis

As discussed in the previous sections, due to the wide-ranging implications of agricultural R&D to the society, no single method can sufficiently capture these impacts. Therefore, a multi-criteria analysis is often recommended for assessing impact, which may also use a variety of methods; in this way one could use more than one measure to assess impact. Using the available information, one can construct an 'effects table' or 'effects matrix' which can be used for comparing projects. The columns of the effects table represent the alternative projects/activities, and the rows represent the criteria by which the alternatives are evaluated.

6.2 Participatory evaluation

Participatory evaluation involves the stakeholders and beneficiaries of a program or a project in the collective examination and assessment of the program or project. The evolution of participatory

evaluation is summarized in Box 6.4. Participatory evaluation is people-centred: project stakeholders and beneficiaries are the key actors of the evaluation process and not the mere objects of evaluation.

Participatory evaluation is reflective, action-oriented and seeks to build capacity by:

- Providing stakeholders and beneficiaries with the opportunity to reflect on project progress and obstacles;
- Generating knowledge that results in the application of lessons learned and leads to corrective action and/or improvement;
- Providing beneficiaries and stakeholders with the tools to transform their environment.

Participatory evaluation is context-specific, rooted in the concerns, interests and problems of program end users. The end users' immediate reality is what charts the route and determines the evaluator's purpose and direction. Flexibility is the keyword in participatory evaluation. Choices must be made about the degree to which end users can realistically participate in the process.

Box.6.4. Evolution of the evaluation process

The evaluation process since its inception has gone through different stages. Guba and Lincoln (1981) called the participatory evaluation 'the Fourth Generation Evaluation'.

First generation evaluation emerged in the 1900s and can be characterized as measurement oriented, associated with the scientific management movement in the business and industry. The role of the evaluator was technical, providing tools and instruments for measurement—student performance assessment, and time and motion studies.

Second generation evaluation concentrated more on descriptions and led to program evaluations. It focused beyond measurement and dealt more on the achievement of objectives and analysis of strengths and weaknesses. The role of the evaluator went beyond the technical to include that of describer.

The third generation evaluation was characterized by efforts to include judgement as an integral part of evaluation. Thus the evaluators also became judges.

The fourth generation evaluation refers to the most recent evolution in evaluation practice and involves negotiations. It incorporates stakeholders more centrally into the evaluation process by taking into account their claims, concerns and issues. They embrace a more qualitative approach to evaluation. The evaluator becomes facilitator of the negotiation process with stakeholders who participate in designing, implementing and interpreting the evaluation. Stakeholders are not viewed as the subjects of experiment or object of study, but rather as participants in the evaluation process.

6.2.1 Functions of participatory evaluation

Participatory evaluation serves four key functions, some of which concerns the stakeholders and beneficiaries while others relate to the funding agencies.

1. It helps to build the capacity of stakeholders to reflect, analyse and take action—such analysis should occur throughout the life of the project.

2. It can contribute to the development of lessons learned that can lead to corrective action or improvement by project recipients—when project stakeholders are involved in analysing problems, constraints and obstacles, they can often propose solutions.
3. It can provide feedback for lessons learned that can help program staff improve program implementation. A participatory evaluation not only looks into the past but also guides into the future.
4. It helps to ensure accountability to stakeholders, managers and donors by furnishing information on the degree to which project objectives have been met and how resources have been used.

The focus on lessons learned is an essential dimension of participatory evaluation. Such evaluations should help to guide projects into the future by giving stakeholders the tools with which to take corrective action. In addition, lessons learned should provide donors with the insight and tools to improve program delivery and management.

Participatory evaluation may take place during the course of a project (usually at its mid-point), or at the end or a significant amount of time (e.g. 2 years) after a project has been completed. Undertaking an evaluation at mid-point offers several advantages. It presents an opportunity to take stock of a project's progress to date, its achievements and any obstacles encountered. Lessons learned can be applied and corrective action can be taken if necessary. Since mid-term evaluations are forward looking, they can provide stakeholders with the tools to take a different course of action.

6.2.2 Key characteristics of a participatory evaluation

The following are the key features of a participatory evaluation:

- It draws on local resources and capabilities;
- Recognizes the innate wisdom and knowledge of end users;
- Demonstrates that end users are creative and knowledgeable about their environment;
- Ensures that stakeholders are part of the decision-making process; and
- Uses facilitators who act as catalysts and who assist stakeholders in asking key questions.

At the heart of participatory monitoring and evaluation (PM&E) however, are four broad principles:

- **Participation**—which means opening up the design of the process to include those most directly affected and agreeing to analyse data together.
- **Inclusiveness**—the inclusiveness of participatory M&E requires negotiation to reach agreement about what will be monitored or evaluated; how and when data will be collected and analysed, what the data actually means, and how findings will be shared, and action taken.
- **Learning**—the process leads to 'learning' which becomes the basis for subsequent improvement and corrective action.
- **Flexibility**—since the number, role and skills of shareholders and external environment and other factors change over time flexibility is essential.

The characteristics of participatory evaluation are participation and collaboration, problem solving-orientation, knowledge generating, creativity releasing, using multiple methods and experts involved as facilitators.

Participation and collaboration

In the evaluation process collaboration ensures the participation of all those affected by project decisions. This includes beneficiaries as well as program and project staff. Special efforts are made to ensure meaningful participation by women, junior project staff as well as extension workers.

Problem solving orientation

The driving force behind participatory evaluation is not accountability to outsiders, but development at the local level. Participatory evaluation becomes a process whereby the participants in a development project are empowered to learn and take effective action in solving problems.

Generating knowledge

Participatory evaluation aims to generate knowledge among local people at the community and project level. When users are actively involved in data collection processes, information becomes transformed into knowledge and leads to self-sustained action.

Releasing creativity

Participatory methods are creative and learning in this environment builds self-esteem and confidence essential for initial action.

Using multiple methods

Validity and reliability are achieved through the use of multiple methods, and by including different users and stakeholders in community building. If available tools are considered inappropriate, new tools are created.

Involving experts as facilitators

If evaluation expertise is not available within the community, then an external expert is included to facilitate shared decision-making throughout the entire process of participatory evaluation. The task of the facilitator is to share ideas, help people consider options, and let the process be taken over as far as possible by users, community people and project staff.

It is important to note that:

- To be effective, participatory approaches require significant time and flexibility in order to account for unexpected events;
- Participatory approaches still call for outside expert advice. Outsiders have recognized their limitations in performing participatory evaluation;
- Programs or projects that provide indirect benefits to the community may be more difficult to evaluate in a participatory sense than direct benefit projects;
- Participation and participatory approaches are a particularly desirable strategy in the case of projects with a broad client base and/or direct delivery to individual beneficiaries and researchers;
- Participation and participatory strategies work best when evaluators have inside knowledge of program and geographic locales in which program/evaluation is being carried out; and
- A participatory evaluation approach still benefits from expert input from those knowledgeable about the program sector, and evaluation theory and practice. The evaluation professional must continue to give advice on evaluation approaches and past experience in participatory evaluation.

6.2.3 Participatory evaluation and conventional evaluation

The key differences between participatory evaluation and conventional evaluation are summarized in Table 6.2. The conventional evaluation in most cases is donor-focused and donor-driven. Donors are the key clients, provide the financial support and contribute significantly in defining the terms of references (ToR). Very often evaluation is carried out more to fulfill a management or accountability requirement than to respond to project needs. An outside expert/evaluator or team is hired to conduct the

evaluation. The evaluators collect the data, review the project or program and prepare a report. In most cases, stakeholders or beneficiaries play a passive role, providing information but not participating in the evaluation itself. The process can be considered more linear, with little or no feedback to project.

Table 6.2. *Comparing conventional and participatory M&E*

	Conventional M&E	Participatory M&E
Who plans and manages the process	Senior manager or outside expert	Local people, project staff, managers and outside stakeholders often helped by a facilitator
Role of primary stakeholders and intended beneficiaries	To provide information only	Design and adopt the methodology, collect and analyse data, share findings and link them to action
How success is measured	Externally defined, mainly quantitative indicators	Internally defined indicators including more qualitative judgment
Approach	Pre-determined	Adaptive
Defining terms of reference	Largely donors and managers	Stakeholders including beneficiaries
Question makers	Largely managers and donors	Stakeholders
Evaluator/evaluation team	Mostly outsiders	Mix of outsiders and beneficiaries
Process	Linear with little or no feedback	Two way flow of information
Purpose	Management/accountability requirement	Build capacity of stakeholders and management/accountability requirement
Role of the evaluator	Plays the lead role	Acts as facilitator
Method	Heavy reliance on quantitative methods	Relies heavily on interactive qualitative methods but does not disregard quantitative tools

Source: Cummings (1995).

In participatory evaluation, the role and purpose of evaluation changes dramatically. Such an evaluation places much (if not more) emphasis on the process as on the final product, the report. The purpose of the evaluation is not only to fulfill a bureaucratic requirement but also to develop the capacity of stakeholders for assessment and action. Stakeholders and beneficiaries do more than provide information. They also decide on ToR, conduct research, analyse findings and make recommendations. The evaluator in conventional evaluations becomes more of a facilitator in participatory evaluation—guiding the process at critical stages and consolidating the final report based on the findings of the stakeholders.

Participatory evaluation recognizes the wide range of knowledge, values and concerns of stakeholders and acknowledges that these should be the litmus test to assess and then guide the project performance. Participatory approaches to evaluation have the capacity to empower recipients. The active participation of stakeholders can result in new knowledge or a better understanding of their environment. It is this new knowledge and understanding that can enable them to make changes they themselves have discovered or advocated. As a result of active involvement of stakeholders in reflection, assessment and action, a sense of ownership is created, capacities are built, beneficiaries are empowered and lessons learned are applied both in the field and at the program level, thus increasing the effectiveness.

The emphasis in participatory M&E is placed on beneficiaries and stakeholders not as providers of information, but as active participants in the evaluation process. Supplementing more formal methods of inquiry, such as standard questionnaire or one-to-one interviews, with non-formal techniques can yield rich information than the use of only formal methods.

6.2.4 Collaborative evaluation approach

A collaborative approach is one form of participatory approach in which the evaluator works directly in partnership with a group of stakeholders (people who have a stake, i.e. vested interest, in how the evaluation comes out). The evaluator and the stakeholders work together to focus key evaluation questions, design the evaluation study, interpret the results and apply findings. This is a process of shared decision-making. The evaluator is 'active-reactive-adaptive' in facilitating an evaluation process that addresses the concerns, interests, questions and information needs of a group of stakeholders organized into some kind of evaluation task force. The evaluator helps the task force members deal with the issues of utility, feasibility, propriety and accuracy, but does not decide unilaterally how these standards of excellence will be met. While in a normal situation, the evaluator is completely responsible for the process and responds to the audience's requirements for information.

The process of collaborative evaluation involves:

- Discussion with clients, program staff and audiences, i.e. everyone in and around the program to gain their expectations and purpose for the evaluation;
- Based on these discussions, the evaluator places limits on the scope of the evaluation program;
- The evaluator begins to discover the purpose of the project, both stated and real, and the concerns that various audiences may have with the project and/or the evaluation;
- The evaluator then begins to conceptualize the issues and problems that the evaluation should address;
- Designing of the evaluation process; given the data needs, the evaluator selects whatever approaches are most useful for generating the data;
- The evaluator now proceeds to carry out the data collection procedures that have been identified;
- Once the data have been collected and processed, the evaluator shifts to an information reporting mode. The evaluator also identifies the key issues for reporting; and
- At times, evaluators are not very skilled at working with groups. They need to operate with patience, sensitivity and good humour.

6.2.5 Steps in participatory evaluation¹

In general, participatory evaluation consists of four basic phases: pre-planning and preparation; generating evaluation questions, data gathering and analysis and reflection and action. These steps are discussed here.

Pre-planning and preparation

This phase of the participatory evaluation is managed at the institutional level far from the day-to-day lives of end users. In order to establish stakeholders' interest in conducting participatory evaluation, mobilize broad-based support by soliciting end users' input and collaboration. Since participatory evaluation strives for transparency, openly discuss the purpose, goals and objectives and the various supporting or competing agendas of evaluation.

Establish who wants to know what for what purpose? Review program document to gain an understanding of the context. Review available baseline data. Address logistical matters such as terms of reference, identifying participatory evaluation participators and stakeholders and other administrative matters.

¹ This section draws on Narayan (1993).

In order to make this step participatory:

- Outline a conceptual framework based on participatory evaluation principle;
- Define parameters for the participatory evaluation (i.e. what can and cannot be achieved);
- Assess constraints and resources or enabling and inhibiting factors;
- Identify the participatory evaluation facilitator, team members and stakeholders—use wider consultation; and
- Negotiate the purpose and objectives of participatory evaluation with key actors.

Generating evaluation questions

At this stage of the process:

- Discuss and decide with end users which data collection methods have high probability of yielding data that are useful and relevant to both outsiders and insiders;
- Assess the current research skills of the persons involved in the participatory evaluation and provide training as needed;
- Determine whether or not different methods will be needed for collecting various types of data. Consider a mix of data gathering techniques;
- Take into account prevailing socio-cultural and political climate. Specific issues to address are:
 - Sensitive to socio-cultural milieu;
 - Indigenous language issues; and
 - Gender issues and cultural diversity (minority groups)
- Negotiate evaluation questions with stakeholders. This may involve field visits and workshops;
- Negotiate data collection techniques and provide training as needed. At this stage the evaluator/evaluation team works shoulder-to-shoulder with key actors.

At this stage in order to improve participation:

- Facilitate participatory workshops or field visits to stakeholder workplace or residence;
- Collectively identify the focus of the evaluation.

Data gathering and analysis

At this stage of the process:

- Design appropriate venues for meeting with end users and working with them in a participatory manner
 - Workshops of cross-section of representative end users, multilevel and multifaceted;
 - Field visits for face-to-face contact; and
 - Small groups working as focus groups.
- There may be a need for thorough instruction or training for the evaluation team members;
- Triangulation and cross-checking of information is vital to verify and validate the process and data.

In order to facilitate participation:

- Provide necessary training in data gathering methods;
- Gather data collectively; and
- Analyse data collectively.

Reflection and action

Empowerment is the critical aspect of this process. The best rule is to 'know that we do not know' the situation as do the people who live in it. It is through our disempowerment that they are empowered.

The final phase of the participatory evaluation is characterized by the creation of solutions to end users' problems. The group should begin with the problem or evaluation questions that were originally defined and articulated by end users.

The goals of this activity are:

- To validate end users' experience by using it as the basis for future action plan rather than using outsiders' experience/plan;
- To motivate end users to find solution and act on them rather than avoid them; and
- To promote a sense of self-determination and sustainability through feelings of empowerment.

In order to improve participation:

- Prioritize problems to be solved or questions to be answered;
- Coordinate resources for solving problems identified during the evaluation; and
- Take collective action.

Projects and programs that have a clearly identified group of end users and beneficiaries lend themselves to experimentation with this methodology.

A wide range of methods and tools have been used in PM&E. These include maps, Venn diagrams, flow diagrams, diaries, photographs, videos, matrix scoring, network diagrams etc. Some of these tools are discussed elsewhere in this sourcebook. The duration of the evaluation will vary depending on its complexity and availability of stakeholders to participate in all aspects of the evaluation. The entire process may involve several workshops with the stakeholders. A planning workshop, where stakeholders can define the parameters of the evaluation, a smaller workshop for data collection and possibly another workshop for the analysis of data and feedback.

The degree and level of participation will depend on a number of factors:

- Context of the project;
- Degree of willingness and commitment on the part of all stakeholders to participate in a participatory evaluation process;
- Availability of baseline data;
- Availability of time and resources to enable stakeholders to collect data; and
- Any external constraints that may impede stakeholder participation.

If the evaluation process is to be meaningful, then at the very least, stakeholders should participate in defining the parameters of the evaluation, analysing the findings and proposing solutions. Their involvement in the collection and analysis of data may depend primarily on the availability of time and resources. Ideally the evaluation report should reflect the findings, concerns and recommendations of the stakeholders.

6.2.6 Characteristics of an evaluator/facilitator

Three evaluator styles have been identified in the literature. These are:

- The surveillance and compliance approach where the evaluator is independent and can be highly critical. Program personnel are viewed as potential or suspected outlaws. The evaluator is on a mission of law enforcement, i.e. emphasises justice;
- The second style is that of the aloof and value-free scientist who focuses single-mindedly on acquiring impeccable data. This style emphasises on truth. Program personnel are research subjects to be labelled and studied in accordance with the roles of science;

- The third style is when the evaluator works in consultative consensus building process to help policymakers and program personnel cooperatively and openly clarify their information to improve their effectiveness. All are treated as partners in the search for useful information, i.e. emphasises utility.

The evaluator needs the cooperation, good will and interest of a variety of decision-makers and information users to conduct a high quality and useful evaluation.

The consultative style aims at four practical accomplishments. These are:

- Getting decision-makers and information users to share responsibility for the evaluation;
- Getting decision-makers and information users to care about the evaluation;
- Making sure that decision-makers and information users understand the evaluation process and evaluation findings; and
- Increasing the personal commitment of decision-makers and information users to actual use evaluation processes and findings.

In participatory evaluation the evaluator plays a facilitating role. Typically a social science researcher or development practitioner with considerable field experience, experience as educator of adults or as informal trainer; and reasonable grasp of qualitative methods such as PRA and group dynamic techniques is chosen as an evaluator. They must also have the capacity to listen, guide and facilitate discussions, helping the group to ask key questions, encourage trust, delegate tasks and responsibilities, plan action to help bring together the view points of various stakeholders; and create an environment of sharing and reflection. The facilitator must act as a catalyst or stimulator managing the evaluation without being seen as directing it.

6.2.7 Group dynamics

One of the greatest benefits of the participatory approach to evaluation is the group dynamics that the process generates. Several things that can be accomplished with a group are less likely to occur with individuals.

For example, these are a few things that can be accomplished with a group:

- An environment of openness can be established to reduce suspicion and fears about what is going on in the evaluation. The key stakeholders who participate in the process know how decisions are made and who was involved in making them.
- Participants in the group process become sensitized to the multiple perspectives that exist around any program. They are exposed to divergent views, multiple responsibilities and competing values. Their view is broadened. This increases the possibility of conducting an evaluation that is responsive to different needs, interests and values.
- New ideas often emerge out of the dynamics of group interaction.
- A sense of shared responsibility for the evaluation can be established. Commitments made in groups, in front of others, are typically more lasting and serious than promises made to an evaluator in private.
- It is difficult to suppress touchy questions or negative findings. Issues get raised and findings get publicized that otherwise might never see the light of day.
- The evaluator can assess the interpersonal relationships among the various stakeholders. This information can be very helpful in developing utilization strategies.

- It is possible to generate some momentum that helps to reduce delays or roadblocks resulting from the attitudes or actions of one person.
- The group will often continue to function after the evaluation is completed. Participants can develop a shared commitment to follow through on utilization of evaluating findings and recommendations. Stakeholders stay with the program after the evaluation is over.

6.2.8 Measurement and assessment of PM&E indicators

M&E involves asking a number of broad questions concerning project output, effect and impact. Essentially, we need to know what happened as a result of the project activities, when and to what extent. We need to understand the economic, political and social changes which have occurred and how these are perceived. For this purpose, indicators need to be identified and agreed upon to illustrate the results and changes we are looking for. The use of indicators is a prominent feature of most M&E systems.

Participatory projects are often intended to minimize top-down planning and encourage responsive, two-way styles. This necessitates the adaptation of criteria to measure the success and progress of these projects. Indicators measuring underlying trends are central to most M&E processes. However, standardized indicators are problematic, because the quality of participation can only be assessed through a process that is itself participatory. The selection of indicators to measure and assess primary stakeholder participation is therefore still a relatively new field.

Challenges for selecting the best indicators include:

- Balancing locally relevant factors with those that can be applied more widely;
- The selection process can be time-consuming, especially if many stakeholders are involved;
- The indicators should capture the tangible and intangible changes.

Alternatives to traditional approaches have focused less on quantitative results and more on qualitative processes. PM&E therefore involves some tangible, physical or material outcomes, which will be visible; quantifiable; ultimately measurable; and of which the extent of change can be judged. However, it also involves qualitative processes. These have to be described and ultimately interpreted to understand the changes that occurred. In addition, participation as a process unfolds throughout and after the life of a project and therefore has a time, or sequential, dimension as well. PM&E is concerned with all three dimensions and appropriate systems need to be established to monitor all of them.

Quantitative indicators

These are most commonly used in project frameworks to measure the extent and magnitude of changes. Whereas the quantification could be sufficient in relation to outputs, the qualitative dimension of participation at the project purpose level should be made more explicit. This is especially valid when participation is an end in itself; and the project success depends on empowering participants to accept increasing degrees of responsibility and control.

Qualitative indicators

Qualitative PM&E indicators are more difficult to specify and use, partly because of the interpretative leeway associated with them. They explain the nature and quality of participation. This essentially involves descriptive statements about the process and outcome of participation, i.e. descriptions of

attributes, traits or characteristics which are not in themselves quantifiable. The latter includes aspects such as decision-making and management capacities, ability to draw up micro-plans self-monitoring roles, group solidarity and sustainability. Such statements draw attention to aspects of participation which numbers alone cannot capture.

However, qualitative statements are rarely context-free and their appropriateness in a specific project should be carefully considered. Their appropriateness is often influenced by cultural norms, which reiterates the importance of primary stakeholders' participation in defining them. Some quantifiable information collected on standard monitoring forms or through surveys may act as proxies for qualitative performance.

Qualitative evaluation is based on the assumption that projects are dynamic and evolving and not simply following a pre-determined direction. It takes us beyond the number game and identifies key characteristics or phenomena, which could illustrate a process of participation and systematically describes and interprets activities and changes which occur in these. Whereas quantitative data can be measured and the extent of participation thus assessed, the more qualitative recordings and observations need to be interpreted in relation to the indicators used. Sample of quantitative and qualitative PM&E indicators are presented in Box 6.5.

Time dimension indicators

The time dimension indicators is important for managing project implementation and monitoring; and directing stakeholders' attention to the phasing of participation. Participation activities are often specified in relation to a project calendar, thus serving as performance indicators for outputs. However, a set timetable could reduce the ability of the project to respond to specific local needs and problems. In contrast, time can also be referred to as a sequence. This is a central concept of milestone planning, which identifies the critical, logically related steps in implementation, while not necessarily placing time limits on each step.

The important things to remember are to:

- Work with the minimum number of indicators which could give a realistic understanding of the evolving process of participation;
- To determine the indicators on the basis of the characteristics and purpose of the project. There are no generic indicators for participation; and
- Involve local people in determining how their increasing participation should best be monitored. Indicators do not necessarily have to be externally driven and supposedly objective.

Indicators need to be verifiable, expressed in practical terms and cost effective to use. The range of methods available should be taken into account, as well as the staff, budget and time implications.

Extending the involvement of primary stakeholders through participatory self-evaluation systems is complementary to more conventional top-down systems. It facilitates the incorporation of local evaluative criteria and can also be a cost-effective way of monitoring the more qualitative aspects of participation.

Box 6.5. Sample quantitative and qualitative indicators

Quantitative PM&E indicators

- Number of project level meeting and attendance levels;
- Percentage of different groups attending meetings, for example, women and landless;
- Numbers of direct project beneficiaries;
- Project input take-up rates;
- Numbers of local leaders assuming positions of responsibility;
- Numbers of local people who acquire positions in formal organizations; and
- Numbers of local people who are involved in different stages of project.

Qualitative PM&E indicators

- Improved and more effective service delivery;
- Organizational growth at community level;
- Growing solidarity and mutual support;
- Knowledge of financial status of project;
- Concern to be involved in decision-making at different stages;
- Increasing ability of project group to propose and undertake actions;
- Representation in other government or political bodies with relation to the project;
- Emergence of people willing to take on leadership;
- Interaction and building of contacts with other groups and organizations; and
- People begin to have a say in local politics and begin to influence policy formulation.

It is also possible to convert some of these qualitative indicators into quantitative measures.

6.2.9 Challenges for PM&E

Common mistakes encountered in PM&E include:

- Assuming that all stakeholders will be interested in taking part;
- Imposing inappropriate indicators and methods in an effort to standardize and save time;
- Being unclear about what information to collect; and how and by whom it will be used;
- Starting too big, too soon; and
- Opening up the assessment process to a wider range of stakeholders may expose conflicts over what is most important, how it should be tracked, and whether goals are being met.

However, an appropriately designed and established PM&E system provides a framework for clarifying and negotiating differences between stakeholders and developing a consensus on what priorities are. This requires openness, a willingness to listen to different points of view, and recognition of the knowledge, role and contributions of different participants.

The major challenges for PM&E include:

- Established notions of rigorous data collection and analysis are challenged when people with different points of view are brought together. Conventional concepts of validity and reliability are questioned as methods are combined in new ways and experts increasingly interact with local people. More emphasis is placed on information that is 'good for the task at hand' rather than being perfect;

- Experience suggests that it is preferable to start small and create opportunities for PM&E to be tested before the process is scaled up and introduced more widely;
- Training at all levels, from villagers to senior management (Estrella et al. 2000).

6.3 Participatory Impact Monitoring (PIM)²

Participation has become a widely accepted strategy for planning, implementation and evaluation of R&D projects. The participatory approach values the input of the beneficiary and becomes associated with increasing the respect for and incorporation of indigenous knowledge, or beneficiary knowledge, in all aspects of a program or project. Participation occurs during the entire project cycle, namely: need assessment/problem identification, project/program design including feasibility analysis, project/program implementation; as well as monitoring and evaluation including impact assessment.

The logical framework approach is often used to identify objectively verifiable indicators for this purpose. It has been argued by development practitioners that this so called traditional monitoring and evaluation caters to evaluating economic and technical impact and what is needed when dealing with communities is a system of monitoring that may address the 'softer', 'hidden' and 'informal' impact that the project may have on the target beneficiaries. These impacts are called 'socio-cultural impacts'. Traditional M&E systems are used to measure 'objectively verifiable indicators', whereas socio-cultural analysis, want to understand and develop qualitative indicators. Participatory impact monitoring (PIM) is an emerging method to assess the socioeconomic impact of a project/program on the target beneficiaries—largely based on subjective judgement and perceptions of the stakeholders. The various aspects of PIM are discussed in this section.

6.3.1 Definition and objectives of PIM

The whole process of evaluation since its inception has gone through several evolutionary stages. The current stage of development is called the 'fourth generation evaluation'. The fourth generation evaluation deals with both subjective and objective means of assessment. PIM is a fourth generation technique and it uses subjective interpretations as foundation for evaluation.

PIM is defined as a 'method that is used to evaluate the socio-cultural impact that a project has on the project environment'. Several autonomous actors are involved in PIM. These may be, according to context: farmer groups, self-help groups, development organization, NGOs and the funding agency. These are what we usually call 'stakeholders' in a development project. PIM recognizes the subjective perceptions of all stakeholders, or, in other words, PIM is based on the joint perception of impacts by stakeholders.

Monitoring of budget, activities and project objectives are catered for by conventional M&E systems. Therefore, PIM focuses on subjectively important changes. And since many actors are involved in a project, and because a project has got many impacts of different kinds, it is important to recognize both quantitative as well as qualitative aspects in the assessment process.

PIM invites members and stakeholders to observe, reflect and make decisions with respect to a project. The practical purposes of monitoring are 'checking', reflection and learning. On the one hand, reflection takes time, but PIM argues that reflection, at the other end, saves time, because if you reflect you may avoid time-wasting activities. In this sense, it is being argued that 'reflection is investment'.

2. This section draws heavily from Eberhard and Germann (1996).

It is believed that the involvement of all stakeholders in the monitoring exercise will improve the realization of the project's purpose. The objectives of PIM are then to:

- Gear activities to members' needs;
- Involve members in observation, reflection and decision-making; and
- Strengthen the involved organization's structures

In order for PIM to be applicable, stakeholders must be willing to be flexible and to face a change in the project, or operate according to the 'trial and error' technique:

- To move from more rigid schemes of evaluations to continuous monitoring;
- Move a little bit from the factual to the social level;
- To be more attentive to subjectively important changes rather than objectively verifiable indicators; and
- Begin to perceive trends rather than to determine exact information, and emphasize informal rather than formal structures.

Against this background, the proponents of PIM argue that:

- Objectively verifiable indicators function mechanically; and
- In dealing with community based development programs one needs simple monitoring systems and indicators.

6.3.2 Key elements in PIM

PIM is usually conducted by all levels of stakeholders in the form of groups. This adds an additional requirement for PIM to be effective, such as regular group meetings, the interest of members, willingness of group leaders to communicate and that group members are willing to invest a little time in joint management.

To sum up, we may say that the key elements in PIM are the following:

- Interaction between the project actors. Each group of actors covers its area of interest. A systematic mode of observation is not achieved by accumulating data, but only through cooperation between actors. The project data and autonomous monitoring systems of the individual actors are discussed regularly at Joint Reflection Workshops. If the aims and perceptions of the individual actors differ, PIM may serve as an early warning system.
- Informal structures play a significant role in PIM. The significance of the informal structures is underlined by the existence of the different actors participating in monitoring. The observation criteria, indicators, and reporting only have to be suitable for the respective actors, so that they can make decisions.
- The more intangible the goals, the less exact the information that can be obtained. PIM is especially suitable when we are dealing with development goals, thus catering for the subjective interpretations of all actors involved.
- PIM wants to encourage actors to form hypotheses about their expectations. This means that since the goals of PIM are intangible, we cannot expect to obtain exact information. Even if the information is not accurate, it is first assessed within a group, verified and disputed and, if necessary, supported by additional perceptions from other group members. Therefore, the group serves as a filter and corrective mechanism. So, rather than perceiving objectively verifiable facts, PIM aims at discerning trends.

This means that:

- Inaccurate observations are permissible
- No formal indicators are expected

PIM does not make a strict differentiation between changes, effects, and impacts. Firstly, PIM rather tries to identify the subjectively important changes at the beginning. Only in a second step does PIM determine how these changes are related to the activities of the project actors and, hence, they become effects. Thirdly, the performance and range of changes are determined by regular monitoring. Due to this 'self-cleaning mechanism', effects and performance are filtered out mechanically.

The key elements of PIM are regular observation and reflection at different intervals and to a different depth at the individual level. PIM can be used at any stage in the project cycle, since it is not based on formal specifications or plans.

PIM contains elements of both formal logic and network logic. Expectations, as we shall see below, turn into indicators, which may be used for purposes of formal logic. The different actors involved also provide PIM with a natural network logic. Additional spillover effect is realized in the form of learning processes.

6.3.3 The special features of PIM

The special features of PIM are:

- Complements conventional or formal M&E methods;
- Goal oriented;
- Emphasizes socio-cultural impact;
- Is based on informal processes and structures;
- Indicators may not always be exact, but will however illustrate essential trends quickly and plausibly;
- Subjective evaluation is an important selection instrument. PIM wants a solution that is subjectively the best for all actors;
- Uses limited perceptions to recognize patterns and interpret them;
- Guided more by experience and intuition;
- Promotes autonomous activities of the stakeholders;
- Encourages cooperation and participation; and
- Self-help promotion by stakeholders

6.3.4 Steps in PIM

PIM is performed in several steps, and is ideally conducted simultaneously by all actors involved in their respective locations and at their respective levels. The different groups regularly exchange their information, perceptions, and interpretations at Joint Reflection Workshops, discussing their expectations and fears regarding the project, thereby enhancing the understanding between the groups. A systematic mode of observation is not achieved by accumulating data, but only through cooperation between actors. The more congruent the aims and expectations of the individual actors are, and the more they are in agreement with the overall project goals, the more smoothly and efficiently PIM will function. The aim of the Joint Reflection Workshop is to discuss and communicate the observations of those involved regularly. At this occasion observations are compared, the socio-cultural impact is analysed, decisions are taken, and, if necessary, measures and decisions may be taken to improve on

the monitoring. The first year it may be useful for the Joint Reflection Workshop to meet every three months. After the first year, an annual meeting may be enough. In order to set up an effective PIM, several basic questions need to be answered.

What should be monitored?

The first step of PIM consists in determining what is to be monitored. It is useful to monitor informal and comprehensible objectives, such as expectations and fears, and the effects that were not planned. The group should systematically monitor the changes that are important to them. We can say that PIM aims at collecting fears and expectations, by answering the following questions:

- What changes do we expect from the project?
- What changes do we fear from the project?

By means of prioritizing, the group may then reach consensus and select 3–5 important aspects. This process should be dynamic. Therefore, the expectations and the fears should be corrected and refined continuously. The project team on their behalf may reflect over the issue: ‘Based on previous experiences, what socio-cultural changes do you expect or fear from the project?’

How can it be monitored?

After having chosen some expectations and fears, the group should attempt at establishing some concrete examples of how it is possible to see if things are changing the way they want or not. Now you are looking for indicators. Here PIM does not ask for scientific solutions, but for practical ones, and relies on the collective knowledge of the group. In establishing the indicators, continuous reflection is more important than the gathering of hard data. This may seem a little bit difficult, and therefore PIM suggests four ways to establish indicators, out of which the appropriate one is to be selected:

- measuring or counting
- scaling or rating
- classifying
- describing qualitatively.

Other stakeholders may wish to link with conventional M&E system at this step, if available.

Who should monitor?

The people responsible for monitoring should be chosen at the meetings held by the group. By assuming the role of observers, members of the group learn to watch for relevant changes and to assume responsibility. It is important to stress, once again, that it is crucial that members are interested in follow-up and monitor the indicators and that they do that responsibly. Often members holding senior positions are chosen to avoid the creation of a parallel structure of power.

How can results be documented?

There is a need to keep a record of the indicators in the monitoring process. The dictum: ‘Always carry a notebook and a pen’ applies very well in this context. For example, if three people should visit a cattle market with the aim at establishing the market prices of different livestock, and do not bother with taking notes, it is quite possible that they will quarrel about the information received at the end of the day. Taking notes, on the other hand, maintains peace and clarity in the team. Any way of recording

is appropriate, such as tables, graphics, charts and descriptions. However, the group may wish to keep some information inside the group, and not have this exposed at the Joint Reflection Workshops. It is important for the group to decide on this.

Another crucial step in the process is monitoring of reports. At the beginning of every group meeting, indicators are reviewed, and relevant changes are observed, following the presentations of the observers. The revision of indicators can be done by asking the simple question 'What have we observed?' Following the presentation, there may emerge a discussion in a group as to whether other relevant changes have taken place.

Some useful questions at this step are:

- *Have the indicators changed?* If yes, this may lead to corrections and refinements of the indicators used.
- *What other important factors have changed?* This will indicate whether additional indicators ought to be observed.

The reports of the involved stakeholders are then presented at the Joint Reflection Workshop. As a loose guide for discussion, it may be useful to discuss the following topics together:

- What has changed?
- What/who has changed?
- What has caused the change?
- How has it changed?
- How has this change affected you?
- What other changes have occurred as a result?

It may appear at the workshop that the monitoring system needs to be revised or changed. This may happen if the following applies:

- If time shows that indicators are not useful;
- If new fears and expectations arise;
- If funding agencies need improved information flow. If this applies, the group must decide what they think about it, and negotiate with the external organizations.

Analysis—why these results?

It is important that the findings from the preceding step are reflected upon and discussed. Generally, the results of observation require analysis and discussion in the following situations.

- If results are as expected, this is probably a success and it is worth analysing for why and how these results were achieved.
- If the monitoring results reveal problems that require decisions, the meeting should put the topic on its agenda immediately.

At this step, cause–effect relationships are not documented but can be prepared at any time. It is useful to analyse reasons for both good as well as poor performance.

What action should be taken?

After the analysis, the group defines its agenda and takes decisions. The decisions are based on factual reasons and the members are enabled to participate responsibly. The leadership of the organization becomes more transparent and democratic.

However, the last step of taking action is not a final one. The action that we take will create new impacts on the project environment and each stakeholder will then be back at step one again and re-initiate the process of monitoring, establishing indicators, reflect upon those, and so on. The process of reflection will provide a useful point of learning from all actors involved: learning about ourselves, as well as learning from others.

6.2.5 Limitations of PIM

PIM is actually a very simple and easy monitoring system, once participants become used to carrying their notebook along, and start looking for, and reflecting about, the indicators that have been selected. However, PIM has its limits:

- PIM is only a concept and cannot be a solution to all problems;
- PIM is limited to a manageable number of dynamic elements.

Until the group learns how to apply PIM and acquire the necessary experience in doing so, its value as a tool will be limited. PIM should always be used in conjunction with an objectively oriented M&E system.

It is worth noting that the comprehensive impact assessment framework proposed in this sourcebook includes the socio-cultural impacts also.

6.4 Process monitoring³

In the recent past a distinction has been made between process monitoring and progress monitoring. Conventional progress monitoring focuses on physical, financial and logistical aspects of projects whereas process monitoring deals with critical processes which are directly related to the project objectives. An ideal M&E system should contain elements of both progress and process monitoring. The development of process monitoring was part of social science's response to the need for field research data relevant for decision-making within a learning process approach.

An underlying assumption of process monitoring is that there is an ideal way in which a process should develop; that there is an objective towards the process ought to lead. Process monitoring tells the project staff and management that what was being observed is close to ideal. If not, then what needs to be done to steer the process closer to that 'ideal'? Process monitoring is a continuous process of observation, interpretation and institutional learning. The core of process monitoring is addressing key project processes and identification of problems and bottlenecks resulting from them.

6.4.1 Key features of process monitoring

The difference between the conventional progress monitoring and process monitoring are summarized in Table 6.3. The salient features of process monitoring are:

- Observes features of process in each project phase and provides feedback to the management for making necessary changes;
- Investigates processes within the community, project and wider socioeconomic context;
- Helps projects learn from their own experiences and adapt to improve their effectiveness over time;

3. This section draws heavily from World Bank (1999).

- Looks at both internal and external processes;
- Evaluates the quality and effects of project interventions and outcomes:
 - Involves participant observation and critical assessment;
 - Helps understand the motives, intentions and actions of different actors in a project;
- Can be used at different levels (individuals, within project, interaction between projects and other actors, wider institutional and socioeconomic context) and to analyse the interaction between these levels;
- Can also be used to assess the impact of changes in project strategies, rules and procedures.

Table 6.3. *Process monitoring and progress monitoring: A comparison*

Process monitoring	Progress monitoring
<ul style="list-style-type: none"> • Concerned with key processes for project success • Measures results against project objectives • Flexible and adaptive • Looks at broader socioeconomic context in which the project operates, and which affects project outcome • Continuous testing of key processes • Selection of activities and processes to be monitored is iterative, i.e. evolves during process of investigation • Measures both quantitative and qualitative indicators, but main focus is on qualitative indicators • A two-way process where information flows back and forth between field staff and management • People-oriented and interactive • Identifies reasons for problems • Post-action review and follow-up • Includes effectiveness of communication between stakeholders at different levels as a key indicator • Is self-evaluating and correcting 	<ul style="list-style-type: none"> • Primarily concerned with physical inputs and outputs • Measures results against project targets • Relatively inflexible • Focuses on project activities/outcomes • Indicators usually identified upfront and remain relatively static • Monitoring of pre-selected indicators/activities • Measures both qualitative and quantitative indicators, but main focus is on quantitative indicators • A one-way process where information flows in one direction, from field to management • Paper-oriented (use of standard formats) • Tends to focus on effects of problems • No post-action review • Takes communication between stakeholders for granted • Is not usually self-evaluating and correcting

Source: World Bank (1999).

6.4.2 Key steps in process monitoring

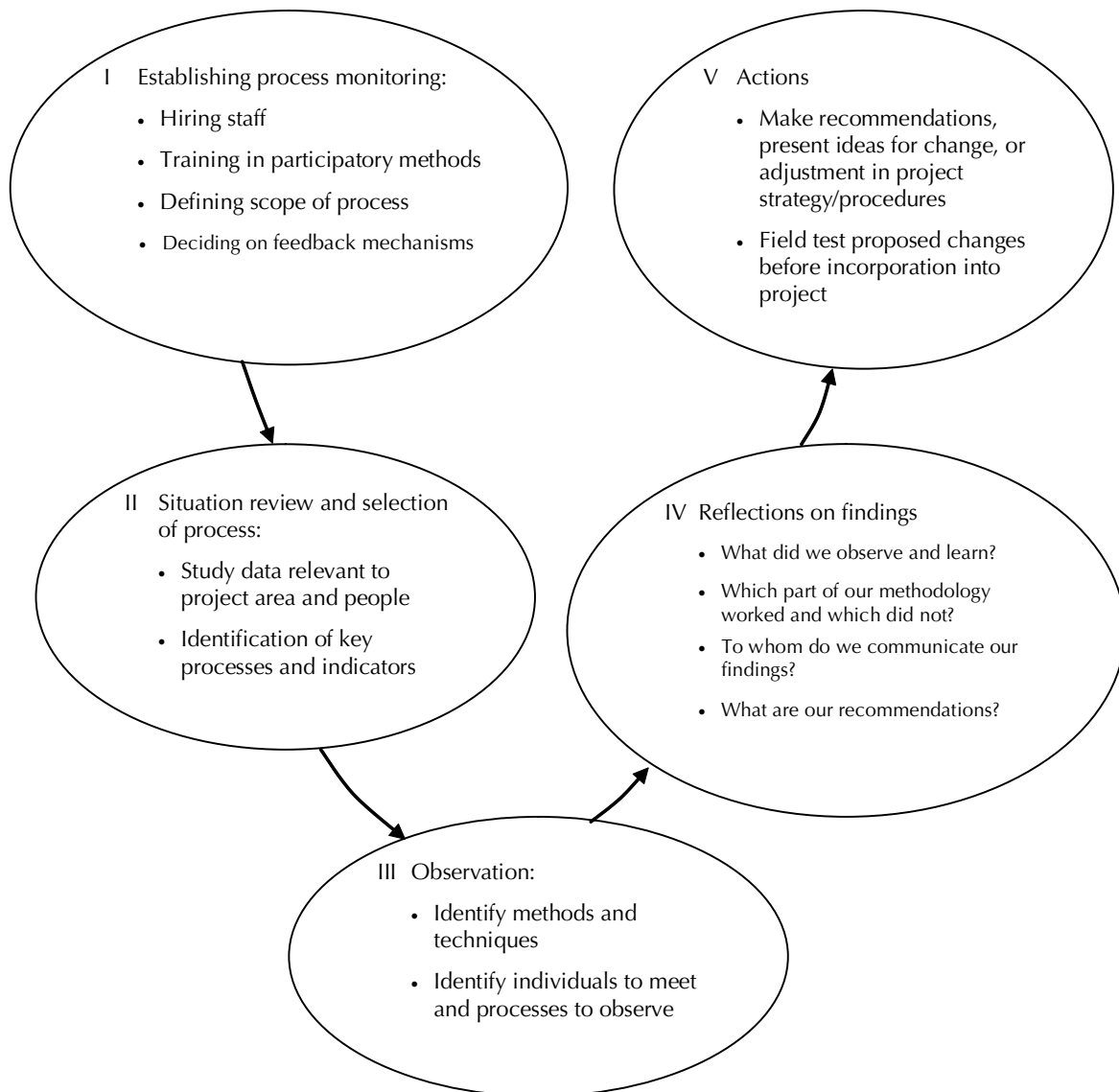
The proponents of this approach identify five steps in implementing process monitoring as shown in Figure 6.6. These steps are discussed here.

Step 1: Establishing the process monitoring unit/team

This involves a number of steps such as recruitment of staff, defining the scope including documentation and information sharing.

Recruitment of staff

The first step in the establishment of the unit/team is recruiting/identifying the staff. In forming the unit/team, make sure that the individuals involved are:



Source: World Bank (1999).

Figure 6.6. Steps involved in process monitoring.

- Experienced in community development and M&E;
- Trained in participatory methods, participant observation conflict resolution etc.

It is also crucial to attain effective gender balance. The unit/team should be located within the project, but should ideally have its own budget for transport, office equipment and communication. It is also important to develop working relationship with staff from other units.

Defining the scope of process monitoring

It is important to define the scope of process monitoring from the very beginning. In defining the scope it is important to note that the process monitoring cannot be carried out independently of progress monitoring. Process monitoring should be an integral part of the project's own M&E system. The process monitoring activities should focus on project rules and procedures and communications between key actors and levels. The scope should define the objectives, boundaries, information recording as well as sharing of such information. In defining the scope:

- It is useful for process monitoring to be both 'internal' to the project, but with 'external' linkages and independent reporting channels;
- The unit must establish channels and procedures for information flow to and from between the management and itself;
- Information should be recorded and shared with key stakeholders;
- Findings should be presented in an easily readable and usable form.

The ultimate test of the success of process monitoring is whether the information it generates leads to concrete decisions and actions to address critical issues to improve project performance.

Step 2: Situation review and selection process

This step enables the unit/group to reach a common understanding of which processes are important and why? Primarily the step involves collecting data on projects, project area, beneficiaries, discussing issues with key resource people and stakeholders.

There are basically two approaches for selecting key processes for monitoring:

- Key processes should be closely linked to project objectives and the project cycle. Key indicators are then identified for each stage in the project cycle. The number of processes selected for monitoring should be limited;
- Process not previously identified for monitoring, but in which the project experiences problems and/or bottlenecks may be added to the key processes identified earlier.

The selection of processes to be monitored should be made in consultation with project management, staff, as well as beneficiaries and other relevant stakeholders.

Step 3: Observing key processes

It is important to observe processes as objectively as possible. At times specialized training may be required to minimize biases in people's ability to observe objectively. Collection and analysis of qualitative information also requires relevant skills and experience. Therefore, it is important that process monitoring staff receive appropriate training before they begin their work.

In addition a number of other questions also need to be answered in order to implement an effective process monitoring.

- Who makes the observation?
- What methods will be used for process monitoring?

The best methodology should be identified and agreed upon in the advance. If the issue deals with community processes then methods such as transect walks, participatory need assessment, participatory discussions and participatory resource mapping are suitable. Some of the common tools used in process monitoring are summarized in Box 6.6.

Step 4: Reflections on analysing findings

When the observation is completed, it is necessary to assess the information collected. The team has to address a number of issues when analysing observations. These include:

Box 6.6. Useful tools in process monitoring

- Participant observation
- Participatory discussion (focus group)
- Semi-structured interview
- Transect walks
- Participatory resource mapping
- Participatory need assessment
- Process monitoring working groups
- Project planning meetings
- Special studies
- Topical sessions

- What turned out differently than expected?
- Which part of the strategy to gain insight into the process produced desired results and which did not?
- Was a cross-section of views sought and accommodated?
- With whom do the findings need to be shared?
- In what form should these be presented?

It is crucial to document answers to these questions and communicate to the relevant stakeholders.

Step 5: Follow up action

Based on the observations and analysis the unit/group should make recommendations for project management/institution. It is also imperative to identify and discuss the implications of the proposed changes.

6.4.3 Developing process monitoring indicators

One of the crucial steps in the M&E process is the identification of relevant and critical indicators. Indicators are variables that describe or measure changes in an activity or situation over time. They are useful tools for monitoring the effects of a process intervention.

Developing a set of indicators follows a three steps approach:

a) Defining project objectives and activities

It is practically impossible to identify indicators and use them in the monitoring and evaluation process if the objectives, activities and output of the project are not clearly defined and understood by all stakeholders. Developing an 'objective tree' (based on the problem analysis/problem tree) and distinguishing priority immediate, intermediate and long-term objectives is a good way to start the process. A useful tool for defining objectives is the Logical Framework Analysis.

b) Asking relevant questions (What? Whom? When?)

Once the objectives are sorted out and agreed upon, a number of questions need to be answered before identifying indicators.

- What do we want to know? (and how does it relate to the project objectives)

- What information do we need and for what purpose?
- What is the minimum number of indicators that will tell us that we have accomplished the objectives
- How, when and by whom these information be collected?
- What are the cost (resource) implications?

Answers to these questions will help us to identify the indicators and establish an M&E system for the project/institution.

c) Identifying indicators

Identification of the final set of indicators should be done in a participatory manner. While identifying indicators it is worth noting that:

- Each objective or activity can be measured by different indicators;
- Indicators may change over time as projects' internal and external environment change and as the project activities change;
- Developing useful indicators is a process sometimes involving negotiation between conflicting interests.

A final test for the indicators selected is to make sure that they are SMART (specific, measurable, attainable, relevant and timely).

- Ideally, process monitoring methods and indicators should be effectively integrated into the project's M&E system.
- There should be clear criteria for monitoring processes, with clearly defined roles, responsibilities, methodology, realistic time frame and resources for implementation.
- An essential prerequisite for effective process monitoring is open mindedness and willingness to listen to the views of others.
- Process monitoring must be flexible and adaptive in response to changes.
- Process monitoring should operate at all levels. Focusing only on one level can be misleading by obscuring the impact of other forces on project effectiveness.

6.5 Outcome mapping⁴

Outcome mapping is a methodology for planning, monitoring and evaluating development initiatives that aims to bring about social change. The process of outcome mapping helps a project team or program to be specific about the actors, its targets, the changes it expects to see and the strategies it employs. Results are measured in terms of changes in behaviour; actions or relationships that can be influenced by the team or program. It enhances the team and program understanding of change process, improves the efficiency of achieving results and promotes realistic and accountable reporting.

The key terminologies/concepts used in outcome mapping are: boundary partners, intentional design, outcome challenges and progress makers.

Boundary partners

Individuals, groups or organizations with which the program interacts directly and which the program hopes to influence.

4. This section draws heavily from Earl et al. (2001).

Intentional design

The planning stage, where a program reaches consensus on the macro-level changes it wants to influence and the strategies to be used.

Outcome challenge

Description of the ideal changes the program intends to influence in the behaviour, relationships, activities and/or actions of a boundary partner.

Program markers

A set of graduated indicators of changed behaviour of a boundary partner that focuses on the depth or quality of change.

- This is a tool that assists program teams in learning from and with reporting realistically on their achievements by tracking the connections between what they do and what happens.

Outcome mapping focuses on change process and outcomes. It defines the limits of the program's influence, promotes strategies that are appropriate to the context and recognizes the potential contributions of other actors. Development results (or outcomes) are measured as changes in behaviour and relationships of actors with which the program interacts directly. Performance is assessed as the program's contribution to influencing those changes with outcome mapping. It is possible to develop and use indicators that facilitate comparison and learning while retaining the relevant contextual details of the story at each site or in each case.

Outcome mapping:

- Is especially useful in projects where success depends on behavioural change;
- Provides tools that help a development program to think holistically and strategically about how it intends to achieve results;
- Is usually initiated through a participatory process at a design workshop led by internal or external facilitators who are familiar with the methodology.

Among other points,

- It is useful to include boundary partners in the initial workshop for their input on the relevance, activities and direction of the program;
- Ideally, the M&E system would have been outlined at the planning stage of the program;
- Outcome mapping is a 3-stage, 12-step process (Figure 6.7):

Stage 1 Intentional design

Stage 2 Outcome and performance monitoring

Stage 3 Evaluation planning

Stage 1: Intentional design

The four basic questions to be asked at the intentional design stage are:

Why? Which supplies the vision statement

How? Which gives the mission, strategy maps and organizational practices

Who? Which provides the partners, such as boundary partners
What? Which answers expected outcomes, challenges and progress markers

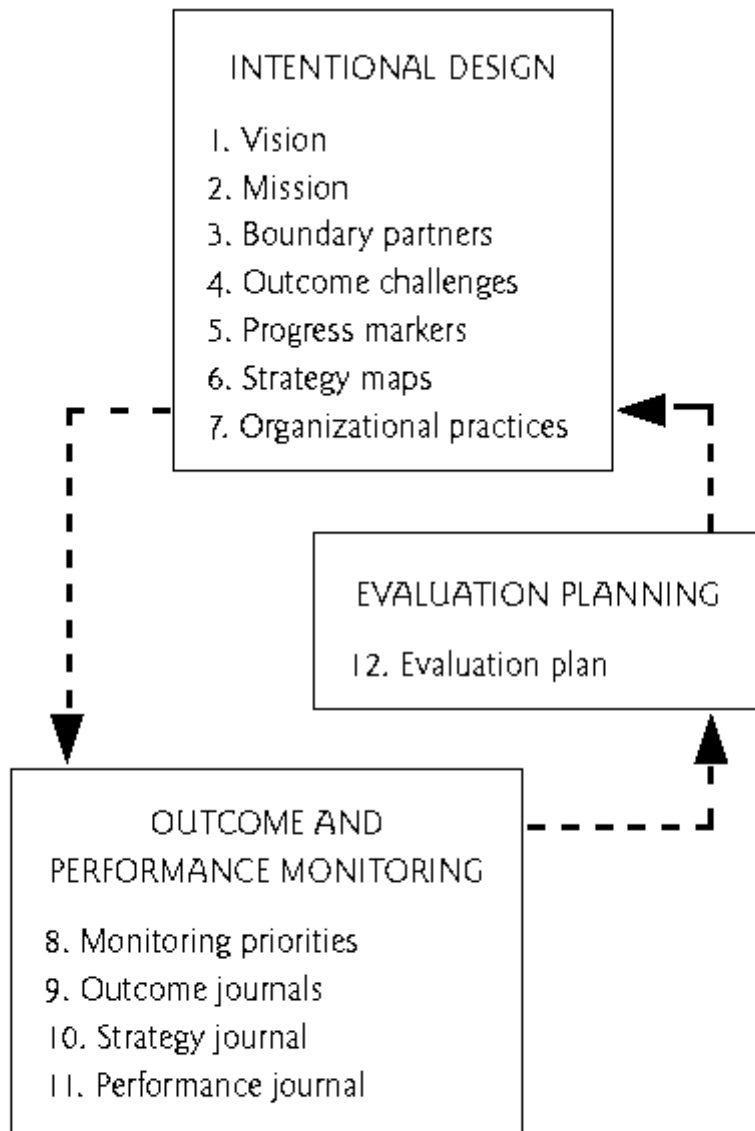


Figure 6.7. Outcome mapping.

This stage helps the team clarify and reach consensus on the macro-level changes they would like to support and to plan appropriate strategies. The long term goals provide reference points to guide strategy formulation and action plans (rather than acting as performance indicators). Progress markers which are used to track performance are developed for each boundary partners.

Outcome mapping does not help a team identify program priorities. It is appropriate and useful only when a program has already chosen its strategic direction and wants to chart its goals, partners, activities and progress towards anticipated results.

Stage 2: Outcome and performance monitoring

This stage provides a framework for monitoring actions and boundary partners' progress towards outcome/goals. The three data collection tools that can be used in this process are:

- (a) An outcome journal to monitor boundary partners' actions and relationship;
- (b) A strategy journal to monitor strategies and activities;
- (c) A performance journal to monitor the organizational practice that keeps the program relevant and viable.

These tools provide workplace and processes and help the team reflect on the data they have collected and how it can be used to improve performance. Here it is important to select only that information that they can afford to collect.

Stage 3: Evaluation planning

This stage helps the team set priorities so they can target evaluation resources and activities where they will be most useful. This stage outlines the main elements of the evaluations to be conducted.

References

- Anandajayasekeram P, Martella DR and Rukuni M. 1996. *A training manual on R&D. Evaluation and impact assessment of investments in agricultural and natural resources research*. SACCAR
- Anderson JR and Herdt RW. 1990. Reflections on impact assessment. In: Echeverria RG (ed), *Methods for diagnosing research system constraints and assessing the impact of agricultural research*. Volume II. ISNAR (International Service for National Agricultural Research), The Hague, the Netherlands. pp. 35–42.
- Cummings FH. 1995. Role of participation in the evaluation of and implementation of development projects. Paper presented at the International Evaluation Conference, Vancouver, Canada, 1–5 November 1995.
- Earl S, Carden F and Smutylo T. 2001. *Outcome mapping: Building learning and reflection into development programs*. IDRC (International Development Research Centre), Ottawa, Canada.
- Eberhard G and Germann D. 1996. *The concept of participatory impact monitoring*. GTZ; GmbH, Eschborn, Germany.
- Estrella M, Blauret J, Campilan D, Gaventa J, Gonalves J, Guijit I, Johnson D and Ricafort R. 2000. *Learning from challenge: Issues and experiences in participatory monitoring and evaluation*. Intermediate Technology Publications, London, UK.
- Guba EG and Lincoln YS. 1981. *Effective evaluation*. Sage, Beverly Hills, California, USA.
- Narayan N. 1993. *Participatory evaluation tools for managing change in water and sanitation*. World Bank Technical Paper 207. World Bank, Washington, DC, USA.
- World Bank. 1999. *Process monitoring for improving sustainability: A manual for project managers*. World Bank, Washington, DC, USA.