EXTENSION IN AFRICA: AN INSTITUTIONAL ANALYSIS

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TABLE OF CONTENTS

CHAPTER ONE - INTRODUCTION

I. Introduction

> The origins of extension work can be traced largely to the formal organization of 'agricultural extension' during the second half of the nineteenth century in Europe and North America, the models having since spread to other geographical areas and to other fields of human activities. What remained throughout, however, has been the idea of extension as a way of communicating technical and scientific information to clients on the assumption that once they started using this information it would enable them to improve their living conditions (Huizinga, 1982, p.134).

In the literature and through personal communications I have found resistance to the use of the word extension. The primary alternative phrase is technology transfer.[1] There are good reasons for moving away from a word which implies a one-way flow of information but technology transfer seems no better in this regard. Extension in a large body of literature represents a broad array of information delivery on topics such as agriculture, health, home economics and urban development. Because this paper draws heavily on the literature concerning agricultural extension, it is appropriate to use the term. However, it is crucial to recognize that extension is an integral part of broader agricultural information systems.[2] Additionally, there is a difference between extension systems and services. This paper discusses both. The extension system encompasses all elements relating to extension: the overall mission of extension, its internal organization, and relationships to surrounding organizations and institutions. Extension services include all the activities undertaken by staff in the course of interacting with clientele.[3]

The traditional argument for extension (publicly or privately) is that it provides information as an input

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[1] Two organizations who use this term are USAID and ISNAR.

[2] A concept which describes the broader context within which extension exists is Roling's (19..) Agricultural Knowledge Information (or utilization) System.

[3] Services are institutionalized interventions - usually publicly funded.

to the production process like seed or fertilizer. As Toulmin (1985) states, "Even when a new technology has been developed, its successful adoption by farmers is not assured, since this will depend crucially on the structure of input and output prices and on the adequacy of the extension system through which the supply of essential inputs can reach the producer (pp. 2-3)." Also, it is assumed that extension will hasten the benefits of adoption of new practices or technologies which lead to improved production. As suggested by Williams (1967) agricultural extension is an education process which deals directly with the improvement of agriculture. From this perspective extension's main function is to disseminate information on new practices and technologies. This assumes that there are appropriate technologies to offer. However, extension many other equally important functions: providing feedback to researchers (especially concerning farmer knowledge systems), facilitating participation of farmers, actively working with researchers and farmers to adapt technologies, facilitating access to inputs, and provision of marketing information. Finally, extension cannot effectively carry out a its myriad tasks in a vacuum. To fulfill its potential to help alleviate Africa's agrarian crisis, extension's linkages with other organizations are critical.

The key elements of all extension entities are laid out in figure 1. The central element is the objective. The other basic elements are designed based on the relevant objective. The organization of extension refers to both the internal structure and the linkages with surrounding organizations. The target refers to who or what the extension service intends to interact with. The content refers to the substance of extension's work with clientele such as message delivery, assistance in organizing local groups, distribution of inputs.[4] The mode of interaction describes how the interaction will take place.

[4] The original term used by Royen was "offering".

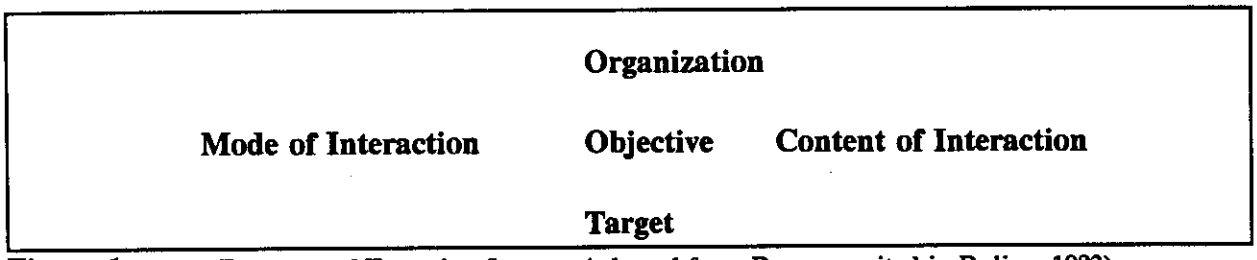

Figure 1: Basic Elements of Extension Systems (adapted from Royen as cited in Roling, 1982).

II. Problem Statement and Objectives

Rapid population growth in Africa has put tremendous pressure on the agricultural sector to increase food production for domestic consumption and to be more competitive in world commodity markets. One of the factors needed to "attain more rapid broad-based agricultural growth and rural development" is the "strengthening of the institutional base for smallholder agriculture" (Staatz and Eicher, 1990, p.28). As a part of that base, agricultural extension has the potential to be an important factor in increasing agriculture and livestock productivity and rural incomes, as well as reducing hunger in Africa by providing a wide variety of services to rural families. The problem this paper addresses is, "How can agricultural extension more effectively help alleviate the continuing agrarian crisis in Sub-Saharan Africa?"

The investigation of these questions is organized around the following objectives:

(1) to describe the evolution of agricultural extension systems in Sub-Saharan Africa;

(2) to analyze the basic elements of the extension system from an institutional perspective;

(3) to apply the institutional perspective to some specific extension problems;

(4) to provide a vision for the future of extension and strategies for attaining that vision.

III. Extension in Africa

Two points were very clear to me during the two and a half years I worked as an extension agent in Tanzania with the Peace Corps. Firstly, African small-scale farmers need information and on a broad range of topics, including better farming and livestock production techniques. Secondly, extension field staff want to help farmers. A Tanzanian farmer once lamented to me that weeding rice paddy is very painstaking as the weeds look very much like the rice plants and one has to work standing ankle deep in mud and water. I had recently heard about the possible availability of herbicide for rice and mentioned it to him. He was shocked. "You mean there is dawa (chemical/"medicine") that can be sprayed on weeds in rice fields to get rid of them?" I replied, "Yes, but we don't know when we will get it." He was ready to use it the minute he could get his hands on it. Of course to use the "dawa" requires a sprayer which, at the time (1987) cost, at least 15,000 shillings -- more than twenty bags of maize at a fairly good price (800 shilling per bag) or more than one years pay for a low level civil servant. There were five sprayers at the district agricultural office for use in over 120 villages. The local extension worker in the farmer's village did not have a bicycle and had to walk several hours just to visit the farmer I spoke with that day.

This scenario illustrates many of the well-documented problems with agricultural extension services in Africa. Specifically, farmers want and need improved technology, and credit to facilitate technology adoption. They also need advice on use of pesticides, a reliable input supply, and an understanding of the economics of alternative practices. They also need information on marketing: prices, collection points and packaging. Clearly information is an important good required by African farmers.

Unfortunately, most extension staff are not well prepared to offer this information. They generally have little or no transportation yet must travel long distances and thus have a difficult time reaching clientele. They are typically unsure about the appropriateness and availability of inputs. They receive little or no information

from their supporting office concerning credit arrangements, or alternative practices to discuss with farmers. They are poorly trained in farm management analysis and other diagnostic skills and methods for teaching farmers to do their own diagnosis. They are typically not trained to facilitate autonomous local organizations for collective action. They are low-paid and thus have more incentive to work on their own income-generating activities than to visit farmers. Without adequate support, extension agents are not functioning at full capacity. These are some of the reasons behind Africa's continuing agrarian crisis.

These weaknesses persist despite the long history of donor support for agricultural extension around the world. During the post Marshall plan era, extension as a concept and an area of investment for development agencies, was spread to other parts of the world. During the 1940's and 1950's the US mounted a large scale program of assistance to extension services in Latin America based on the principles of direct diffusion. Although the U.S. government claimed to be promoting the land-grant model of extension in developing countries throughout the 50's and 60's, "it was the label not the concept and functions of an integrated research, education and extension model that was transferred" (McDermott 1987, as paraphrased in Van Crowder 1990, p.3).

Numerous international donor agencies have supported various forms of extension around the world. The Food and Agriculture Organization of the United Nations (FAO) has focused on a farming systems research orientation as well as logistics and management support. "FAO's most extensive support to extension is provided through field projects. More than 500 such projects, under implementation in 1980-1986 were concerned mainly or partially with extension" (FAO, 1989, p.14). During the 1950's USAID supported the land grant model and then shifted to integrated rural development. From 1975 - 84 USAID had 1,065 projects involving extension and 266 focusing on extension (World Bank, 1989). During the 1980's AID moved away from support of public sector extension and began to push for increased private sector involvement for technology transfer. In 1989

266 focusing on extension (World Bank, 1989). During the 1980's AID moved away from support of public sector extension and began to push for increased private sector involvement for technology transfer. In 1989 USAID had only six public sector extension programs: Malawi, Cameroon, Sierra Leone, Zaire, Rwanda, and Mali (USAID, 1989). "AID has continued to support selective improvements in public extension institutions, particularly the increased use of mass communications technology. AID has also sought to more effectively mobilize private sector involvement in agricultural extension activities" (USAID, 1989, p.16). The International Fund for Agricultural Development (IFAD) has had 150 out of 188 projects that included an extension component. IFAD supports no specific methodology (World Bank, 1989). During the 1980's the World Bank has focused its support for extension on the T&V. In 1988 of 82 World Bank supported projects involving extension, 33 employed the T&V strategy.

Considerable funds have been invested in agricultural extension programs by African governments, African taxpayers and international aid organizations. FAO (1989) is spending approximately 25 million dollars per year on extension, of which 43% has typically gone to Africa. The USAID extension portfolio was 200 million per year, from 1987-89, or 20% of total agriculture outlays. Between 1965 and 1989 the World Bank supported 538 agricultural projects world wide that included extension; of these 216 were in Africa. The extension portion of the 538 projects was US$4.8 billion of which the World Bank contributed over US$2.2 billion (Hayward, 1989). As of May 1988 the on-going spending on World Bank supported projects involving extension in Africa was US$492 million, the World Bank portion of which was US$184 million. One question this paper poses is who benefits from these expenditures.

Upon reviewing the literature on extension in Africa, I discovered that most of the problems I observed in Tanzania and many of my own ideas on how to improve the extension system were already identified by experienced observers such as Rice, Roling, Moris, Leonard, Whyte, Axinn, De Wilde, and Wharton. Near the

end of my service in Tanzania I worked on a World Bank supported Training and Visit extension pilot project. The early stages of the project failed and I found the reasons behind the failure were documented in the literature. Based on my own experiences, buttressed by a review of the literature and numerous interviews, I conclude that the problems of extension in Africa are already well known and many of the paths for improvement, at least on a methodological level, are clear.

There is no shortage of recommendations for improving agricultural extension. As a summer intern at the World Bank in 1989 I spent three months synthesizing practical recommendations on how to improve World Bank-supported extension projects in East Africa. Published literature on extension in Africa, as well as World Bank files and individual experts inside and outside the World Bank, offer a plethora of recommendations on how to improve extension services. Scholars of extension in developing countries have for years called for more participation and education of small farmers. Decentralization is a popular proposal. The dream of small grass roots organizations becoming empowered to articulate their needs and to push bureaucracies and governments to meet them[7] is found all throughout the literature on extension in Africa.[8] There are examples of changes in these directions (albeit relatively few and on a small scale) and as pointed out by Roling (1982) we need to learn from them. Overall, access to information and services for small and medium scale African farmers has not improved much since independence.[9] Therefore, one central question directly related to the problem statement above is, "Why have the recommendations for improving extension effectiveness had little effect up to now?" and in that context, "What are some future strategies for making extension more effective and affordable?"

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[7] As the Grange did in the U.S. (True 1928).

[8] (Chambers 1974, Biggs 1989, Stavis 1979, Farrington 1988, Roling 1982, Axinn 1988, Whyte 1975, Leonard 1970, De Wilde 1967)

[9] Some farmers I worked with in Tanzania claimed that things were getting worse.

The organization of the paper is as follows. Chapter two begins with a review of the history of extension in Africa the colonial and post-independence periods. The importance of three critical elements emerges from the historical review: the mission or objectives of extension systems; internal organization and management; and the linkages between extension and surrounding key actors (research, farmers, government, and formal education bodies). In chapter three each of these issues and related recommendations for improvement are analyzed in detail. Different aspects of new institutional economics are used to illuminate the reasons behind the continued practical weaknesses of extension in Africa. Chapter four applies the perspective developed in chapter three to analyze the problem of reaching resource-poor farmers with extension services: it hones in on two specific groups: women and pastoralists. Chapter five advances a vision for the future of extension in Africa and an analysis of how that vision can be attained. Chapter six includes a summary and recommendations for further research.

The heart of extension, or its engine, is interaction with clientele, be it direct or indirect. There is no purpose for extension if it is not to work together with farmers, livestock producers, and other clients to solve their problems and/or improve their current activities. This paper discusses interactions with clientele as a central part of an overall analysis of extension systems in Sub-Saharan Africa. Clientele/extension interaction is a thread that runs through the whole paper: from the history of such interactions in chapter two; to the way extension is organized, managed and linked with other organizations which defines how it interacts with clientele and what it has to offer them in chapter three; to the effectiveness of those interactions also in chapter three; to some specific examples in chapter four; and finally to a look at how extension systems can improve the quality of clientele/extension interactions.

CHAPTER TWO - HISTORICAL OVERVIEW

I. Extension During the Colonial Period

A. Introduction

This section discusses the objectives and organization of agricultural "extension" activities during the colonial period organization behind those activities, and the colonial legacy in terms of approaches for carrying out extension work in Africa. One of the key premises of this paper is that institutional change is costly, not only in terms of expenditures for buildings, staff, and training but also because of entrenched vested interests and expectations. Many of the institutions (rules and regulations) associated with extension are remnants of the colonial era: i.e. hierarchical structures of the controlling bureaucracies, rules and/or conventions concerning everything from personnel management to training design and report writing. Most colonial agricultural systems were still in place up to the early 1960's and in some cases, such as Zimbabwe, through the 1970's. Some of the key features of agricultural services during the colonial era were: (1) links to external empires which assured access to inputs, markets, technical information and human capital; (2) reliance on direction and compulsion; (3) institutional instability; and (4) lack of appropriate technologies for small-scale farmers.

B. Objectives

In many cases the primary objective of colonial extension was to ensure that commodity production for export was maintained at certain levels of productivity and quality. The objectives of extension in the colonial period were different for European and African farmers. Extension efforts often focused on maintaining law and order in African areas whereas in European areas they emphasized "modern" techniques and marketing. For example, in Zimbabwe as extension officers serving white farmers became increasingly specialized, attempts at progressive extension for African farmers were repeatedly thwarted by political opponents of unified extension services for white and black farmers (Kennan, 1990).

The objectives for the agricultural sector in the colonizers' home countries influenced the types of extension strategies used in Africa. In order to devise useful extension policies for the future, this relationship between economic and political priorities and choice of extension strategy must be recognized both historically and in the present.

C. Organization and Mode of Interaction

The organization of colonial extension systems was top-down whether in the context of a broad service for the whole country or separate services for individual commodities. The colonial extension approach for African farmers was characterized by a high degree of coercion. In Tanzania, "[b]efore 1950 the 1500 or so extension workers had been, in effect rural policemen who arrested and prosecuted farmers who did not follow the Native Authority rules and regulations. Most had only a few weeks agricultural training and many were related to, or appointed by, chiefs" (Coulson, 1982, p.152). In the late 1950's a system of "persistent persuasion" was developed by the British as part of the overall strategy for agricultural development during the final years of colonial rule in what was then Tanganyika. The agricultural development strategy incorporated "voluntary co-operation with extension officers", farming (by choice) on settlement schemes with close supervision, and organized marketing through cooperatives and commodity boards (Ruthenberg, 1964, p.60). Extension by "persistent persuasion" assumed that farmers wanted to increase crop production and were willing to try out new ideas if risk could be minimized. The main objective was to encourage the evolution of mixed farms with both cash crop production and food crops. extension resources were concentrated on those areas and people who were most receptive to growing some cash crops, and those generally living in relatively densely populated rural areas.[1] The major instrument of this form of extension was trained personnel who could make decisions on

[1] Ruthenburg notes that a key reason for encouraging cash crop production was to allow extension to be self-financing. Cash crops generate tax revenue whereas food crops do not.

their own; approximately 1 to every 1,000 farmers.[2] Other instruments were agricultural education in primary schools, local festivals, pamphlets and posters, an agricultural newspaper, demonstration on-farm or special. Additionally extension worked on "activating the people" to encourage their interest in adopting new ideas. Extension work in the field was supplemented by farmer training centers. Field staff helped farmers to seek credit but did not supply it (Ibid.).

Another example of coercion is that of the early cooperatives in Cote d'Ivoire. After WWII through the early 1960's there was increased emphasis on encouraging the "natural dynamism" of local people through the formation of cooperatives. The cooperatives were in fact closer to coercive organizations. They were mainly focused on "supplying seeds and fertilizer, storing the harvest, and building a common fund as a protection against bad harvests" (Elliot, 1974, p.5). The local elders serving as representatives of their villages to these Mutual Societies of Rural Production, which included French administrative and technical officials working in the area, did not speak French. Eventually revolts took place in some areas as cooperative members claimed they did not benefit from the organizations and refused to pay their dues.

Another key characteristic of extension in the colonial period was institutional instability. This instability was often due to political pressure for institutional change rather than attempts to improve extension's effectiveness. Up to the mid-1980's Zimbabwe had six incarnations of extension services focused on African farmers. Up to 1950 extension for whites was mainly done by research workers. In 1950 the Department of Conservation and Extension (CONEX) was established for white farmers. The use of compulsion was instituted in 1951 for African farmers by the Department of Native Agriculture. In 1966 CONEX was broadened to cover white and African farmers and much of the mistrust of the compulsion period began to subside. However, in

[2] Ruthenburg contrasts this with the large numbers of untrained personnel spread around rural areas under the system of ordinances and compulsion.

1969, in response to pressure from white farmers, the administration removed CONEX officers serving tribal areas and put them under a separate institution called the Department of Tribal Agriculture (DTA). African leaders protested the re-attachment of the DTA to the Ministry of internal affairs. They demanded its return to the MOA but in 1978 the DTA was placed in the Ministry of Rural Development under the name Department of Agricultural Development (DEVAG). Finally in 1980 DEVAG was returned to MOA where it evolved into its current form - AGRITEX (Kennan, 1980).

Nigeria also had many different organizational forms and used different approaches for extension. In Nigeria from 1893 to 1920 the British used an individual contact approach to deliver messages about export crops and government regulations. In 1921 a unified department of agriculture was established. Improvements to the extension service that resulted were the formulation of specific extension objectives and the recognition of the need for training. In the 1940's provincial segmentation of the extension service took place. The Ministry of Agriculture was established in 1952 with an extension service division; parastatals took over input supply and other services and production inspectors took over regulatory duties (Akinbode, 1982).

D. The Colonial Legacy

The overall legacy of agricultural "extension" in the colonial period is a one-way communication approach, and top-down hierarchical organizations. Two common extension strategy's of the post-independence period are direct reflections of this colonial legacy: the general extension strategy, and the commodity based strategy.

The general extension strategy, commonly implemented in British colonies, assumes that "useful, practical, relevant technical information is available in the Ministry of Agriculture, and that the appropriate function for agricultural extension is to transfer the technology to farmers" (Axinn, 1988, p.58). It is usually

administrated from the top-down by the Ministry of Agriculture and/or other relevant Ministries, employs a one-way communication approach using field agents to carry out demonstrations and farm visits, offers a limited array of standardized technical information, and targets relatively successful farmers. Some version of this strategy is still in use in many countries in East Africa such as Tanzania, Malawi, Zambia, and Kenya.[3]

In British colonies the "general" extension strategy was the responsibility of the Veterinary and Agriculture Departments in the ministry of agriculture and/or animal husbandry. Extension was thus the field arm of these two departments, not a separate entity. Field staff were deployed at the District and sub-division levels to carry out demonstrations and meetings with groups of farmers and to work individually with progressive farmers. The focus was on agricultural and livestock production with little attention to other rural development issues, input supply or marketing of output (De Wilde, 1967). [4]

Commodity focused extension strategies are common to many countries in Africa. The commodity-based extension strategy focuses on one crop, provides multiple services (information, input supply and marketing) under one administration, may be financed by a specific commodity organization, or served by staff seconded to such an organization by the government. [5] The main weaknesses of this strategy are that it requires

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[3] Although the training and visit strategy has been applied in several of these countries, it has not led to a significant departure from the "general" strategy. This will be discussed in detail in the section on T&V.

[4] British agricultural officers did have a wide range of duties however, including management of public works projects such as dam building (Peberdy, personal communication). Masefield (1972) provides a good overview of the colonial extension service.

[5] Many of the organizations established to manage the production of cotton (such as CFDT in West Africa) and other cash crops established single crop extension structures as a part of multiple service organizations. A variation on this strategy is the "package" program. For a detailed discussion of cotton programs in West Africa see the World Bank's 1988 report Cotton Development Programs in Burkina Faso, Cote D'Ivoire, and Togo. Washington, D.C.: World Bank.

difficult inter-agency coordination, tends to neglect other enterprises in the farming system, and may not facilitate the adaptation of messages to specific needs if a set package is used in diverse areas.

In French-speaking Africa the commodity-based strategy is usually implemented through a contractual relationship between quasi-private providers of extension services and governments. Numerous French-speaking African countries after independence employed Paris-based organizations to carry out extension programs on a contract basis. These organizations are normally supported by the French government and managed by French nationals. The companies providing extension services are typically focused on one major commodity - such as the French company for the development of textile fibers (CFDT) which was started in Mali in 1949. Often many different commodity organizations exist side-by-side. When the Cote D'Ivoire became independent in 1960, there was an extension service for "virtually every commodity sold in significant volume" (DeWilde, 1967, p.182).

An example of a successful commodity-based strategy in the French speaking sphere is rice in Cote D'Ivoire in the 1970's. [6] Organized by The Technical Assistance Society for the Modernization of Agriculture in Cote D'Ivoire (SATMACI), the program had two phases: (1) dissemination of seeds, fertilizer and new techniques to peasants growing upland rice in order to increase production and reduce rice imports; and (2) to encourage farmers to shift rice production from rainfed to irrigated lowlands. The program included a relatively high fixed price for rice. Peasants were closely supervised, provided with inputs and markets and production increased rapidly. Yields were boosted through this commodity-based strategy because of the combination of incentives: a profitable technical package, timely and reliable supply of appropriate inputs (including

[6] The French do not have a word that can be easily translated into "extension". There are, however, several French concepts used to describe various aspects of "extension". Vulgarization refers to the distribution of inputs, explanation of new techniques, and supervision of their implementation and preparation of some marketing arrangements. Encadrement, is the framework surrounding the cadres or field staff carrying out vulgarization. The role of subject matter specialist, however, is not included in encadrement. (Some references on French "extension" (in English) are Elliot 1974, and Fresco and Poats 1986).

information), good prices and assured markets. Because of the relatively high costs of the commodity-based strategy it is most appropriate when all of these necessary factors can be included. In Cote D'Ivoire, for example, the full-blown commodity-based strategy was only continually implemented in areas where irrigation had been put into place. Where rain-fed rice was still being grown SATMACI sold inputs but provided no advisory services. Additionally, extension for rice and cotton has been less successful when competing with relatively profitable crops such as cocoa and coffee (Elliot, 1974).

There are also examples of commodity based extension in English speaking Africa. In Nigeria during the 1960s extension units for export crops were established, leaving other field crops to general extension. The characteristics of successful commodities units were: "(1) decentralized decision making; (2) highly motivated staff in terms of training and payment of claims; (3) timely and adequate supply of inputs; (4) adequate infrastructure; and (5) highly receptive clientele..."(Akinbode, 1982, p.48). This is another example of the confluence of factors needed to make the commodity-based strategy work.

Guaranteed, favorable prices are a strong motivation for farmers to participate in commodity-based schemes. For example, in the Savanna region in Cote D'Ivoire in 1967, a farmer growing the traditional mix of crops (yams, paddy, cotton, maize, groundnuts etc.) could make CD$64.59 (.14 cents/day) with an average holding of .92 Ha. Growing one hectare under a CFDT small-holder cotton scheme earns the farmer with CD$116.27 cash surplus (Blume, 1970).[7] Price is a great incentive for farmers to grow small-holder cotton with the CFDT.

Another commodity based organization with its own extension network is the Society of Technical Aid

[7] Blume gives an estimate of 140-150 days of work for 1 hectare, daily earnings are between 0.77 - 0.81 cents per day.

and Cooperation (SATEC) in Burkina Faso. In the early 1960's SATEC tried to promote animal traction. However, unlike CFDT, SATEC lacked a clearly profitable technical package and had little success. For any commodity based extension strategy, the profitability of the commodity makes it possible for the expensive structure of intensive farm visits and input distribution to be sustained. This strategy is unlikely to be sustainable for commodities with a low profit margin or those produced for primarily for home consumption.

II. Extension in the Post-Independence Period: Broader Mandates

A. Introduction

In independent Africa starting in 1960 the state has played a dominant role in the agrarian sector by providing inputs, extension services and credit, and purchasing products. Although nearly thirty years has passed since independence for many African countries, extension approaches in some cases continue to reflect colonial methods.[8] [9] The transition from colonial agricultural supervisory systems to post-independence extension systems has not always been realized as planned. A study of the roots of economic injustice was carried out in 1988 by a team of 3 Americans and 3 Tanzanians. The hypothesis at the outset was that external forces, such as multi-national corporations, the colonial legacy etc., were the cause. The team found that Ujamaa (African socialism in Tanzania) was more economically destructive than colonialism. Tweeten (1989) argues that "third world poverty is primarily the result of misguided internal policies - apparent in the economic degradation process" p.1110).[10]

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[8] "Pre-independence governments always relied too much on direction and even compulsion; and even today African governments in their impatience to get things done tend sometimes to fall into the same error" (De Wilde, 1967, p.162).

[9] It is notable that Zimbabwe after little over ten years of independence has one of the most innovative extension structures in Africa.

[10] For example, the export base and infrastructure present in Tanzania at independence deteriorated due to many negative policies: (1) producers of major cash crops were paid as little as 24% of the world price; (2) negative real interest rates were a disincentive to savings; (3) private trading in most major crops was made

Independence in Africa led to the setting of broader mandates for extension and development in general. According to the structure of extension systems described in chapter one, changing the objectives requires changing the rest of the basic elements of the system: the content of interaction, organization, the mode of interaction and the target. This section examines how the changing of extension objectives resulted in the evolution of each of these elements. As this evolution progressed, new extension strategies have been introduced such as T&V, FSR/E etc. These strategies will be examined in terms of the objectives they were designed to satisfy.

The colonial administration of "extension" was rarely interactive or responsive but rather focused on supervision of agricultural activities. Some of the new extension strategies which have been introduced are based on perpetuating colonial methods. While others attempt to move into new directions - particularly towards increased local participation.

B. Community Development and Integrated Rural Development: 1950-70's

During the 1950's the dominant objectives of development were to transfer technology and ideologies from the developed world to the developing. The community development (CD) and diffusion of innovations ideologies dominated development efforts of the 1950's and early 60's. CD is based on the concept of local people actively helping themselves to improve all aspects of their community and their own lives.[11] It was a "non-revolutionary" method of promoting change which assumed that local people would identify their needs in

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illegal; (4) public funds were spent on marketing parastatals versus roads and agricultural research etc.(Tweeten, 1989, p.1110).

[11] The ideas underlying community development in an international context arose from British activities such as mass education in its dependent colonies during the 1920's through the 40's. The term was first used by the British in 1948 at a colonial conference on African Administration. "Numerous American advocates of community development maintained that its central purpose was to develop stable, effective, democratic nations and as such...was carrying out the major objective of American foreign policy" (Holdcraft, 1982, p.208).

cooperation with CD workers and develop self-help programs to promote rural development (Staatz and Eicher 1990, Williams 1967). The first major community development program was initiated in India in 1952 followed by programs in the Philippines, Indonesia, Iran, and Pakistan. At its height there were over 60 countries in Asia, Latin America and Africa with either national community development programs or projects. However, by 1965, "most had been terminated or drastically reduced in scope" (Holdcraft, 1982, p.209).

Within the community development ideology, extension staff function as both the motivators of change and mechanism of technology transfer. Community development change agents were to address all the needs of the rural community - not just agricultural issues. India's mandate for its CD and National Extension program laid out the following objectives, "to assist each village in planning and carrying out an integrated, multi-phased family and village plan" covering agriculture, village crafts and industries, health services, education for youth and adults, recreation, housing, special programs for women and youth (Government of India, 1957). In Africa, community development staff often did not replace agricultural field staff but were added to work alongside them and address broader development issues. [12]

The main differences between the extension strategies of the colonial period and the community development era are: mobilization of local participation; bottom-up input into program planning; increased linkage between diverse Ministries; and the broadening of both extension offerings and targets. Many different extension strategies focusing on participation have followed CD. The basic concept which typifies them all is the involvement of farmers in the process of seeking answers to their own farming problems using resources accessible to them (Axinn 1988, Compton 1989).

[12] For example in Botswana, Tanzania, Kenya, Malawi and Nigeria.

Although there are still some community development agents working in rural Africa, the CD approach to rural development was abandoned for three main reasons. First, the need to share power clashed with strong resistance within individual ministries to merging with other ministries or giving up a portion of power to them. Much of the resistance to mergers between technical departments came from the extension divisions. [13] Along these lines Holdcraft (1982) points out that "[l]ocal level coordination was successful when all technical extension personnel and community development workers were supervised by a District administrator rather than representatives of their technical ministries or the national community development agency" (p.222). Second participation was very difficult to achieve. Local CD agents were accustomed to the colonial style of staff/client relations and identified with the local elite. Instead of enabling people, they directed them. The result was that local people did not identify with the programs. Third, successful pilot projects were expanded too rapidly making it necessary to use large numbers of poorly trained staff. All of these problems have continued to plague extension regardless of changing strategies over time.

The early 1970's brought a shift in development thinking from focusing on overall economic growth to meeting basic needs (RRDC Bulletin, Nov. 1978, p.14).[14] The basic needs ideology together with the integrated rural development (IRD) approach incorporated the community development emphasis on a broader social mandate for development activities - including extension. The failure of the direct diffusion of innovations using extension as a mechanism to transform Africa's rural sector was followed by increased "micro-level research on agricultural production and marketing, farmer decision-making, the performance of rural factor markets and nonfarm rural employment" (Staatz and Eicher, 1990, p.15). Agricultural extension alone was clearly not the

[13] As once explained to me by an ex-administrator of the Phillipine extension service, extension's claim to resources is based directly on the number of staff they control in the field.

[14] Basic needs refers to the minimum requirements of every individual of food, shelter, clothing, access to essential services such as safe drinking water, sanitation, transport, health, and education (RRDC Bulletin, 1978, p.13).

solution to the agrarian crisis in Africa. However, extension continued to be an important factor included in development projects. The IRD projects of the 1970's had similar problems to the CD projects of the 1950's: overly rapid expansion, and excessive complexity making them "difficult to implement and replicate over broader areas" (Staatz and Eicher, 1990, p.20). Agricultural extension during this period was still primarily based on the two major colonial strategies: general and commodity based. However, under specific projects, new extension strategies focused on mobilizing participation and cooperation with farmers cooperatives and/or associations, farmer training centers, community development workers and home economics agents.

One of the most well-known integrated rural development projects in Africa was the Chilalo Agricultural Development Unit (CADU) project in Ethiopia. CADU was a comprehensive rural development project initiated in 1967 with support of the Swedish International Development Authority (SIDA). It used an extension strategy involving diffusion of innovations through "model farmers". The project focused on small geographic areas with intensive investment in vehicles and other inputs such as rural infrastructure, credit, and seed multiplication. CADU utilized E$37 million in 7 years [41 million US$ in 17 years '67 - '83] on approximately 600,000 ha. of arable land, covering some 93,000 households [397 dollars per household]. The project also incorporated Ethiopians into leadership positions. Originally 65% of payroll expenditures [or 25% of total project funds] went to expatriates who made up 4% of project staff but this changed as Ethiopians were given top management posts. The number of Swedes fell from 40 in 1968 to 5 in 1974 (Cohen, 1987).

One of the problems of extension staff in IRD or CD projects is illustrated by CADU. Extension activities were expanded too rapidly for existing field and managerial staff to handle. For example, "by 1973 it was estimated that the extension agents were spending up to 50 percent of their time facilitating the provision and collection of credit" (Cohen, 1987, p.93). These activities not only limited time for other extension activities but also affected the relationship between agent and farmer.

In 1974 CADU was expanded to cover the entire Arssi region and became the Arssi Regional Development Unit (ARDU). Under ARDU extension staff were all multi-purpose rural development agents (RDAs). RDAs were involved in everything from literacy campaigns and political education to the organization of youth to promoting changes in crop mix from single cash crops to crop and livestock mixtures suited to each area. Coordination and supervision of field staff and resource management were de-centralized to the District level. However, "ARDUs multi-purpose extension agents reached only a small percentage of Arssi's farm population." "The multi-purpose agent concept did not turn out to be appropriate as field staff did not have the ability, training, or physical capacity to carry out the range of assigned duties" (Cohen, 1987, pp. 176-180). A key lesson from the CADU/ARDU story is that extension strategies that requires huge inflows of external resources may not be replicable, cost effective nor sustainable. An additional lesson from CADU/ARDU is that field staff cannot perform effectively if they are given little support and yet expected to carry out a wide range of duties.

C. Food Production Thrust: 1970's-1980's

The 1972 - 1974 world food crisis brought policy makers from 145 countries together at the 1974 the World Food Conference to set a global mandate to increase food production. The 1968-1974 drought in the Sahelian region of West Africa, added urgency to the task. This led to new objectives for extension in Africa: (1) previously cash commodity-based extension strategies were in many cases broadened to include food crop production; and (2) in connection with farming systems research (FSR) activities, extension's role expanded to include a larger needs assessment and feedback role and stronger links with research (such as participation in local adaptation of technology). This new mandate required changes in extension systems: (1) target groups had to be broadened to include women and other resource-poor farmers; (2) two-way modes of interaction had to be tried and improved; (3) the content of interaction was expanded (information gathering services versus purely extending information, messages addressing the whole farming system - especially food crops); and (4)

changes were made in internal and external organization (new job descriptions for field staff and training methods were developed, increased emphasis was placed on linkages with research and between MOA's and other Ministries).

The commodity-based extension systems have had difficulty achieving the same level of performance in promoting food crops as they do in cash crops. In a recent World Bank study of cotton production in Burkina, Cote D'Ivoire and Togo the extension performance was good on cotton and poor on food crops (World Bank, 1988). Farmers surveyed in these countries were less satisfied with technical assistance and the credit system for food crops.[15] In Cameroon the national extension service in theory has a mandate to cover a wide variety of topics such as agriculture, forestry, animal breeding, marketing, infrastructure, living conditions and training of farmers and extension staff. Nyemba (1987) reviews the actual performance of extension in the Central and South provinces of Cameroon from 1982-83 and compares it to the broad stated mandate. He found that field implementation was narrowed to a focus on cash crops (coffee and cocoa) with little if any actual support going to smallholder production of food crops or other rural development issues.

During the mid-1970's it had become apparent that in order for appropriate agricultural technology to be generated for resource-poor farmers it was necessary to better understand the conditions and constraints under which they operated. Farming Systems Research (FSR) was devised to take a holistic view of all the complexities of the farming system: soils, plants, animals, implements, workers, other environmental influences all managed by the farmer to produce output according to his or her preferences or aspirations using the inputs

[15] Of the farmers surveyed, 91% were generally satisfied with (CIDT) performance on cotton, 85% found input distribution to be very satisfactory, about 70% felt collection and marketing of seed cotton (including credit) was satisfactory. Regarding food crops, only 55% claimed better yields due to CIDT technical assistance, 22% said food crop yields decreased, and 47% are not happy with credit system for food crops (World Bank, 1988, p.87-88).

and technology available to him or her (CGIAR/TAC quoted in Tripp et al 1990).[16]

Extension under a Farming Systems Research and Extension (FSR/E) strategy plays an important role not only in disseminating technology but in helping to adapt technologies to suit specific local conditions. The farming systems approach requires program planning controlled "... jointly by local farm men and women, agricultural extension officers, and agricultural researchers." "The purpose is to provide extension personnel (and through them farm people), with research results tailored to meet the needs and interests of local farming systems conditions" ((Axinn, 1988, p.91). Senegal provides an example of the FSR extension strategy. The nation has a history of on-farm research (or action research) experimentation culminating in the Unites Experimentale from 1968 to 1980. The project helped researchers and extensionists to better understand the structure and organization of small family farms. (Bingen and Faye, 1987). [17] Successful implementation of the FSR strategy requires strong linkages between research and extension. This is an area where there is much need for improvement (see discussion of R/E linkages in chapter 3).

D. Strengthen Organization and Management of Research and Extension Systems: 1980's and the Training and Visit Extension Strategy

In the early 1980's the focus of overall development strategy shifted away from micro level research towards a rekindled interest in the importance of economic growth, macro-economic policies and market

[16] FSR in Africa began with Collinson's work FSR study with the International Wheat Improvement Center (CIMMYT) in Kenya in 1976. One of the major applications of FSR by the International Agricultural Research Centers (IARCs), of which CIMMYT is one, was to incorporate a farming systems perspective to commodity-based research in order to devise technologies that would suit the needs of resource poor farmers (Tripp et al. 1990).

[17] For a good discussion of the origins of FSR/E in Africa see Fresco, Louise O. and Susan V. Poats. 1986. "Farming Systems Research and Extension: An Approach to Solving Food Problems in Africa." In Food in Sub-Saharan Africa, edited by Art Hansen and Della McMillan. Boulder: Lynne Rienner.

liberalization. The 1970's brought a greater understanding of farming systems and rural society but little progress was made in terms of improved production, especially of food, in rainfed areas. The green revolution had not yet come to Africa. FSR took on a bigger role in development programs and overall there was an increased focus on strengthening research and extension institutions. In 1980 the international service for national agricultural research (ISNAR) was formed to support national agricultural research systems in developing countries (NARS). The scene was ripe for a "new" extension strategy. The strategy that arrived on the scene, T&V, came not from Africa but from Asia and was unrelated to the work of extension scholars in Africa.[18]

During the late 1970's substantial research on extension was carried out at the Institute for Development Studies in the University of Nairobi in Kenya.[19] The collective wisdom of the IDS extension brain trust is reflected in the extension chapter of the 1975 Second Overall Evaluation of the Special Rural Development Programme in Kenya. The report lists the factors limiting extension effectiveness as: shortage of staff; staff members' lack of qualifications and motivation; and limited transport facilities. The issues targeted as key to improving extension effectiveness were: individual working performance of extension staff; the overall extension structure; mobilization of farmer participation in extension; and reaching "less-progressive" farmers. Some of the specific recommendations made for improving extension and training are: (1) make average farmers the primary target group; (2) concentrate extension activities on groups; (3) make innovations as simple and appropriate as possible; (4) increase the number of farmers receiving training by taking FTC training to rural locations; (5) mobilize farmers groups through appropriate local mechanisms but never appoint group leaders through extension staff or administration. To improve staff efficiency: make a specific work plan for extension

[18] T&V was designed by Daniel Benor who directed the Israeli extension service for eight years.

[19] The group included David K. Leonard, Niels Roling, Phillip Mbithi, Judith Heyer, Fred Chege and others.

agents; hold in-service courses; provide all field staff members with bicycles.

Clearly many of these recommendations are not new. Mobilizing farmer participation has been an ideal since the CD era. Some of these points are covered by the T&V strategy - simplification of extension offerings, specific plan of work, and in-service training. However, many of these recommendations, have not yet been implemented and are being resurrected as "new ideas" in the 1990's. We will return to some of these points following a discussion of the 1980's experience with the T&V strategy.

A part of the colonial legacy was a large number of government extension staff deployed in the field. Managing this staff effectively after independence has been a serious problem. At independence in many African countries large numbers of ex-patriot middle managers left. The system of agricultural supervision was continued but handicapped by a lack of managerial skills required to make it work effectively - particularly at the District and Regional levels. The T&V strategy being implemented as an extension personnel management system in Asia seemed to address this problem by providing the format for a strictly regimented management structure. In the early 1980's the training and visit extension strategy, was introduced to Africa by the World Bank in an attempt to make existing extension systems more effective.[20] It was hoped that T&V would bring about significant increases in African agricultural production through frequent and regular visits made to deliver simplified advice throughout the entire cropping cycle.

The T&V strategy in Africa has essentially served to reinforce the general extension strategy. It does not attempt to pursue a broad extension mandate as did extension under the CD or IRD approaches to development. Nor does it in any way attempt to pursue the objective of facilitating local participation to improve agriculture and rural life in general. "The T&V system [sic] tries to improve the effectiveness of

[20] The first T&V project was in Turkey in 1967.

existing extension resources by the systematic deployment and in-service training of field workers" (Roling, 1982).

The original version of the T&V strategy had as its basic tenets, a single chain of command, clear job descriptions including only extension communication activities, regular fortnightly training sessions with subject matter specialists (SMSs) and regular farm visit schedules, and the use of contact farmers to diffuse information to other farmers (Benor, 1974 and 1977). In terms of the basic elements of an extension system described in chapter one, T&V can be described as follows: (1) top-down internal organizational structure similar to the general strategy, with no local accountability; (2) external organization which includes indirect linkage with research through the SMS and research attendance at extension trainings, but no linkage with institutions of formal education or farmers associations; (3) an approach based on regular, one-way direct communication with primarily contact farmers (including some farmer feedback but not at the needs assessment stage)[21]; (4) targets mainly farmers using irrigation (though not exclusively); and (5) offerings limited to information on selected crops (no other services are offered such as mobilization of local organizations, supply of inputs or marketing of output).

The system in theory includes feedback channels for both extension and farmers to researchers. At the fortnightly training with SMSs, staff have the opportunity to feedback farmers reactions and their own observations regarding the technical message provided by research. The SMS, theoretically, is a liaison between farmers, extensionists and researchers, delivers feedback, trains field staff and works on adaptive research. The T&V strategy in practice suffers from weak feedback functions and poor implementation of the SMS role. SMSs tend to have unclear job descriptions, spend too much time travelling, and lack adequate training (Howell, 1982). Additional problems of T&V in practice are: a lack of trained managers, inefficient bureaucracies (problems

[21] Work with groups has become a common adaptation of T&V in Africa.

balancing program planning and organization), weakening of existing input supply systems by limiting extension staff activities and a general lack of attention to minor crops and marginal groups.

The cost of T&V, or any intensive field coverage, may lead to problems in terms of long-term financial sustainability. Usually, it is not field staff salaries, or even housing, that make up the large portion of costs but the vehicles, maintenance and fuel required for the lifeblood of the system, regular farm visits, supervisory visits, and training. Phase II of the National Extension Project (NEP) in Kenya carries an approximately 48 million dollar price tag of which 12 million is for vehicles. T&V projects tend to include a relatively large portion of incremental recurrent costs (see table #2 below). This issue will be discussed in detail in chapter three. Although, significant funds have been allocated to World-Bank supported extension projects (many of which utilize the T&V strategy) in Africa, no rigorous evaluation of any national T&V program has yet been completed in Africa.[22] By the end of 1991 the first major quantitative evaluation of T&Vs performance in Africa will be completed. It will cover Kenya and Burkina Faso where the earliest T&V projects were carried out in Africa.[23]

Total extension expenditures from 1959 - 1980 for West and East Africa were US$ 672 million (constant 1980US$) (Judd, Boyce and Evenson, 1986, p.85). According to Hayward (1989) the World Bank between 1965-69 had only 6 extension projects worldwide with extension costs of US$9 million (Bank portion 5mil). In 1975-79 a major increase occurred with a jump to 181 projects total extension cost US$1.2 billion (562 million Bank portion).[24] In 1985 Bank support accounted for "approximately 20% of the total support for agricultural extension in developing countries" (Birkhaeuser et al. 1991, p.609). Total World Bank lending (worldwide)

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[22] In 1988 of 82 projects on-going with extension components 33 applied the T&V strategy.

[23] The study is being carried out under the direction of Dr. Robert Evenson of Yale University.

[24] This increase coincided in part with the advent of Daniel Benor's relationship with the World Bank and his collaboration with Bank president MacNamara in the early 1970's.

approved in 1990 for agriculture was US$3.6 billion. Total project lending (in all areas) approved for Sub Saharan Africa (SSA) in 1990 was US$3.9 billion. In 1990 US$1.6 billion was approved for agriculture projects (23 total -- the projects cover multiple years) in SSA (World Bank, 1990 Annual Report).[25]

Table 1

World Bank Projects with Extension Projects in Sub-Saharan Africa:
Approved by 1990 or Planned for Approval between 1990 and 1994.

	Total Cost (US$ mil.)	Cost of Extension (US$mil)
Projects with an extension component Approved Between 1983 - 1990	2,071.7	405
Projects with an extension component planned for approval between 1990 and 1994	1,544.3	373.6

Source: World Bank field notes

"T&V has become controversial within the extension community, largely because of a perceived rigidity of structure and focus on procedure rather than on increasing the relevance of technological messages and different methods of transferring them to farmers" (World Bank, 1989, p.9). The World Bank's current policy is to continue to focus on T&V but to adjust the system for specific situations. A priority is to make extension projects more cost effective (World Bank, 1989). Recent papers by Hayward (1989), a World Bank staff member, have strongly indicated interest in a new course for extension. Hayward lays out four main principles for improving extension systems: (1) situation specificity; (2) economic sustainability (with emphasis on lowering recurrent costs; (3) system flexibility; and (4) participation (World Bank, 1989 and Hayward, 1989).

[25] Total Bank lending approved for 1990 for education was US$ 1.5 billion. US$ 414 million is the total amount approved for education projects in Sub-Saharan Africa in 1990 (total of 9 projects).

As Roling (1982) astutely observed concerning T&V, "[t]he system seems to go a long way to rationalize the use of existing extension resources. The question is whether the method is really an alternative in the sense of reaching the mass of small-scale producers" (p.106). In the context of T&V's experience in the 1980's it is clear that the ideas raised in the 1970's at IDS in Kenya are still extremely relevant in terms of improving extension's capacity to help overcome the agrarian crisis in Africa. There is still a need to re-assess the overall extension structure, to reach "less-progressive" farmers, to make average farmers (including women) the primary targets, to concentrate extension activities on groups, and most of all to mobilize farmer participation in extension through appropriate local mechanisms.

Table #2[a]

World Bank Supported Extension Projects with a T&V Component in Selected Countries in Sub-Saharan Africa

Country	Total Project Cost	Extension Cost	Cost of Vehicles	Families Directly Covered and Field staff: farmer	% total cost paid by country	% total cost paid by other donors	Recurrent Costs Over the Life of the Project[b]: Total & (%)
Rwanda Agricultural Services Project 1990 - 1996	30.1	17.0	2.4[c]	168,000 (1:750)	10%	0	2.98 (9%)
Zambia Agricultural Research and Extension Project 1988 - 1995	38.8[d]	7.6	4.1	55,900 1:400-800	15%	AFDB+ NORAD 54%	4.9 (13%)
Uganda Agricultural Development Project[e] 1985 - 1990	31.4	3.72	4.4	47,000[f] 1:240	21%	IFAD 46%	3.0 (9.5%)
Burkina Faso Agricultural Support Services Project 1989 - 1997	44.9	24.7	6.4	607,600 (1:350-1,000)	6%	0	21.9 (49%)
Sudan Agricultural Research, Extension and Training in the Irrigated Sector 1986 - 1994[g]	38.0	20.5[h]	1.8	300,000[i] (1:40)[j]	42%	0	10.6 (28%)
Somalia Second Agricultural Extension Project 1988 - 1994	26.7	22.2	2.4[k]	158,000 (1:731)	13%	0	8.4 (31%)
Cote D'Ivoire Agricultural Extension Project 1987 - 1992	58.5	36.2	4.0	200,000 (1:111)	42%	0	44.1 (75%)
Kenya National Extension Project II	47.9	47.9	11.7[l]	NA	35%	IFAD 13%	18.58 (39%)
Cameroon National Agricultural Extension and Training Project 1991 - 1997	31.05	18.59	5.937	700,000 (1:300)[m]	23%	Bi-lateral 9%	13.69 (44%)

Source: World Bank Staff Appraisal Reports

Notes to table 2

a/ All cost figures are in millions of U.S. dollars. b/ Recurrent costs are calculated over the life of the project, not on an annual basis. The percentage refers to the amount of the total loan which will represent operating expenses after the project is completed. This amount does not represent annual recurrent costs, only the percentage of total project cost which will recur over some period as operating expenditures. c/ 2.4 million represents purchases; vehicle operating and other related operating costs are 6.0 mil. d/ Technical assistance represented 25% of total project cost. e/ Other projects with extension are being added for Uganda. f/ This is the total number in the project area, this ratio does not apply to all families in the area. g/ According to Mullen (1989) Project funding for AFNET was $40 million from 1980-1985 (USAID) and $51 million from 1985-1990 (World Bank, African Development Fund, EEC and FRG). During this latter period, the SAR only refers to the contributions of the World Bank and ADF. h/ Includes costs of training and some University support. i/ 240,000 are tenants on irrigated schemes. j/ Only in a limited pilot area covering 615 tenants. Total cost for the two pilots covering 615 tenants includes: housing, training, office and audio/visual production facilities 1.5 million, vehicles and a/v equipment 1.2 mil., fuel and vehicle maintenance 1.7 mil. k/ Vehicles and equipment. l/ 11.7 million or (24.4%) represents investment in new vehicles. 12.5 mil (or 26%) were allocated to operations and maintenance. m/ Only 400,000 farmers receive extension services.

III. Chapter Summary

This chapter reviews the history of extension in Africa with emphasis on the evolution of extension strategies during the colonial and post-independence periods. The colonial extension legacy is one of top-down hierarchical structures, one-way communication approaches, and a focus on helping medium and large scale farmers produce cash crops. The general and commodity-based strategies are both spill-overs from the colonial era. The general extension strategy is usually administrated from the top-down by the Ministry of Agriculture and/or other relevant Ministries, employs a one-way communication approach using field agents to carry out demonstrations and farm visits, offers a limited array of standardized technical information, and targets relatively successful farmers. The commodity-based strategy focuses on one crop, provides multiple services (information, input supply and marketing) under one administration. Commodity based extension strategies generally include the presence of a number of elements: good producer prices, appropriate technology, consistent extension, reliable input supply and assured markets.

Independence brought a broadening of development mandates in general, including extension. The community development (CD) and integrated rural development approaches both led to broad mandates for extension. CD in particular introduced the idea of local participation and thus the importance of clientele identification with extension programs. The "basic needs" philosophy of the 1970's led to increased emphasis on cooperation between extension and research under the mantle of farming systems research and extension. Additionally at this time, many commodity-based strategies began to broaden their mandates to include food crop production. In the early 1980's the T&V strategy was introduced in many African countries to improve the effectiveness of extension programs. However, the T&V system has not been the answer to providing improved, cost-effective extension services to small-scale or resource-poor farmers in less-favorable agricultural systems.

CHAPTER THREE - INSTITUTIONAL ANALYSIS OF EXTENSION SYSTEMS IN AFRICA

I. Introduction

A. Rationale for institutional analysis

As stated in chapter one, the problems of agricultural extension in Africa have remained much the same over time. Additionally, many of the recommendations for overcoming these problems have also been reiterated many times. In order to shed light on the extension quagmire this chapter uses an institutional approach to analyze three basic elements of the extension system: (1) objectives; (2) internal organization; and (3) external linkages with surrounding groups and organizations. The elements of mode of interaction, target and content of interaction described in chapter one in figure 1 will be discussed throughout where relevant. The analysis is focused on elucidating the underlying institutional forces behind: (1) the current form of extension systems in Africa; (2) the lack of response to recommendations for improving extension; and (3) strategies to strengthen extension.

The evolution of African extension systems represent a process of institutional change whereby institutions shape behavior and behavior, in turn, shapes the institutions. In this chapter, the concepts of new institutional economics (NIE) are applied to African extension systems.[1] Some of the concepts applied are: (1)

[1] NIE includes analysis of behavioral norms, the integration of persons with different tastes and preferences, voting coalitions, interest group formation, the prerequisites for (successful) collective action, transaction costs, organization theory, limitations on the rationality of human behavior, rules of thumb for firm decision-making, the determinants of firm structure, coordination problems, rent-seeking behavior, technological change and its relationship to institutional change and the determinants and effects of property rights (Nabli and Nugent, 1989). "The 'old' Institutionalist school criticizes the traditional focus of neo-classical economics in the following ways: (1) its lack of attention to institutions and hence to the relevance and importance of nonbudgetary constraints; (2) its overemphasis on the rationality of decision-making; (3) its excessive concentration on equilibrium and statics as opposed to dis-equilibrium and dynamics; and its denial that preferences can change or that behavior is repetitive or habitual (Nabli and Nugent, 1989, p.1336)." The NIE departs from the "old" school in that it provides constructive criticism to the neo-classical framework by attempting "to modify or broaden the mainstream toolkit and then use this broadened analytical framework to explain phenomena that had previously seemed impenetrable" (Ibid.).

transaction costs; (2) bounded rationality and opportunism; (3) interest group formation and collective action; and (4) organizational theory focused on the structure of bureaucracies.

B. What is an institution?

An institution is "a set of constraints which governs the behavioral relations among individuals or groups" (Nabli and Nugent, 1989, p.1335). Applying this definition, extension is an institution because it consists of "rules and regulations, formal and informal, which govern its operation" (Ibid). As Bromley (1988) points out, "institutions are the rules by which organizations function and interrelate; institutions are not properly regarded as those organizations" (p.1). "Institutions, as the working rules of going concerns, define what is a cost, and to whom" (Bromley, 1988, p.2). In other words when discussing extension in an institutional context we are not referring to the extension service itself as an institution (like a hospital or a bank) but rather to the different procedures, policies, beliefs, and routines that make up the extension system.

C. Institutional analysis applied to extension.

Improvement in institutions is an important aspect of agricultural development. Glenn Johnson (1988) argues that agricultures of LDCs "are now constrained more by existing institutions and human capital stocks then by technologies and stocks of biological and physical capital" (p.1). He considers all four areas to be weak but asserts that those most constrained by institutional deficiencies are biological and physical capital. As pointed out in chapter one, agricultural extension must be strengthened as a part of the support base to small-scale producers. To improve extension's capacity to support small-holder agriculture an institutional strategy must be designed which directly targets the small-holder sub-sector. In each of the following sections a major element of the extension systems will be defined and analyzed in terms of how the institutions neglect some clientele and

possibilities for improvement.[2]

Institutional analysis can be applied to extension at several levels. Take, for example, the objective of increasing extension's focus on women. Female farmers often receive inadequate extension services, or none at all, because culture, training, staff selection procedures and so on add up to extension focused primarily on men. Because of the institutions which make up and surround extension services, women must bear the costs of promoting change in order to receive extension services. Such costs include time, energy and other resources devoted to formation or expansion of interest groups for collective action.[3] At the societal level, the costs of pursuing the objective of more extension focus on women include restructuring of academic programs, selection procedures, in-service training, staff evaluation criteria and other institutional elements. Throughout this paper both levels of analysis will be used.

II. Analysis of Extension Objectives

A. Introduction

Without question, the choice of objectives is fundamental to designing an extension strategy.[4] Roling (1982) argues that the essential elements of the extension process must change when the objectives change. If a strategy is inappropriate it will have limited potential for fulfilling the objectives set by government policy makers and/or extension clientele for a given area. For example, if the objective is increasing homogeneous cash

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[2]. Some authors may refer to such institutional problems as distortions, but they are only distortions for those who are neglected, not for all clientele.

[3]. In addition to start-up costs, there are costs to expanding existing interest groups, such as rural savings groups, to cover new areas. For example, the group leadership must incur information costs to effectively lead the group in new activities. An additional cost may be social and family disapproval of non-traditional behavior.

4 Axinn asserts that in order to identify the appropriate type of extension system for a set of circumstances "the planning group must clarify it's assumptions, specify the purposes for which it supports agricultural extension, and agree on how the extension programme is to be controlled...," (1988, p.133).

crop production (in terms of yields/hectare) a private organization which provides inputs and purchases the final product (such as CFDT in Francophone Africa) has an incentive to carry out an extension strategy with high operating costs. The private organization, whether run by an agribusiness firm or farmer's association, may have a stronger incentive to maintain an efficient management structure than a public organization. However, in addition to providing information on cash crops, extension provides services which are public goods such as information on environmental protection, resource conservation, improved health and nutrition, and youth development. Public and private extension services both have roles to play in the extension system which differ according to the objectives to be met.

The chosen objectives reflect the interests and institutions of the dominant power controlling the extension system. As indicated in chapter two, extension systems in Africa are, by and large, based on institutions inherited from the colonial era designed to supervise and control local people and to direct the production of agricultural products. While not always benevolent, these systems were economically rational for pursuing colonial priorities. Responsiveness to African small-holders was not a priority. Extension systems in Africa are still evolving past the legacy of colonial institutions.[5] Establishing a consensus on the objectives for extension is the first step in identifying needed changes in all the essential elements in the extension system and how extension fits into the overall rural develoment strategy.

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5 An extension mandate with broad goals can lead to the dissemination of contradictory technical messages and conflicting time requirements for field staff. For example, advice aimed at improved soil conservation sometimes may conflict with advice on crop mixes or practices geared to increase short-term farm income or yields (King, 1990). Contradictory technical messages should be identified and addressed by agricultural researchers and extensionists. Resolutions to such conflicts might include: discussing conflicting messages with farmers as options to choose between, based on individual preferences; managerial priority setting (at national or lower levels) before messages are disseminated; and seeking compromises through adaptive research.

B. Alternative Objectives

The existence of conflicting objectives and the transaction costs of negotiating make attaining a consensus a challenging goal. Furthermore, it not reasonable to expect one individual extension strategy to meet the diverse objectives of all regions of a single country. Governments tend to concentrate extension efforts on either "surplus extraction from traditional agriculture, or on surplus generation by focusing on the smallest possible number of farmers holding the largest number of hectares" (Roling, 1982, p.88). This philosophy is guided by scarce resources and short run pressure to increase production. Thus, before discussing the problems of reaching marginal and women farmers (in chapter four) it is already clear that allocating resources to these groups will be met with resistance.

An additional objective for extension is to increase farmer income. This may mean the income of a small group of large farmers or a large group of small farmers. Which clientele group benefits depends on access to resources (especially land), the relative power of different interest groups (eg. civil servants versus subsistence farmers), and the policy environment.

FAO (1989) has a broad set of objectives for extension including farm family development, education to improve self-reliance and problem-solving initiative (similar to the CD era strategy). Such efforts may include cooperation between the Ministries of Agriculture (MOAs) (for technical assistance) and NGOs (to organize and mobilize people at the local level). FAO suggests the development of a mechanism within each national extension system for planning programs that can both help achieve national policy goals and address locally identified problems (FAO, 1989, p.35).

An example of different regional objectives is illustrated by the Cote d'Ivoire where extension services in the north were focused on cotton to develop an income generating opportunity in an attempt to slow

migration to the richer southern regions. On the other hand, the southern part of the country, which has 2.5 million hectares under coffee and cocoa, requires extension services which can teach specialized management skills, and address issues such as pressure on the land which threatens forest ecology (World Bank 1986).

In Ethiopia agricultural extension objectives have been motivated by political changes. Over the course of the past 20 years, policy has shifted from the model-farmer approach and specialized agents under CADU in 1967 to a minimum-package program with input supply tied to advice along roadsides to multi-purpose politicized agents and a focus on cooperatives after the revolution in 1974 to specialized agents with a focus on private farmers and the introduction of T&V (Cohen, 1987). Currently, Ethiopia is divided into zones within which donors implement different approaches.[6] This provides the government an opportunity to compare different strategies. However, the Ethiopians, not the donors, must be able to control the process if they are to exploit the opportunity to build a pluralistic system which meets their multiple objectives.

As indicated by these examples, extension objectives change for many reasons, environmental, economic, or political. In order for extension strategies to evolve to fit new objectives the extension system must have a flexible structure. Within such a system diverse strategies would be implemented concurrently and old strategies routinely scrutinized and improved upon.

C. How the Mandate is Set

How extension mandates should be set is an important point of debate. At the International Seminar on Rural Extension Policies held at Wageningen in 1989 (IAC, 1989), two views were presented: (1) set policy "at the top" through governments and external donor agencies; or (2) set policy through a process of dialogue

6 Examples include, a grass roots approach promoted by the EEC and T&V promoted by the World Bank and the African Development Bank.

with field workers and farmers which focuses on a diagnosis of field reality. There is also a middle ground between these two extremes where grass-roots participation in the policy dialogue is married with national-level decision-making. The success of such a compromise depends on: (1) the strength of the relationship between the extension service and the rural community which determines the efficacy of feedback mechanisms; (2) the ability of extension and other institutions (such as farmers organizations) to facilitate participation; and (3) the national commitment to grass-roots participation and capacity to utilize it.

How the objectives of extension are actually set depends a great deal on the balance of power and the political process within a given country. In a democracy, the objectives for public or quasi-public extension systems should closely reflect the demands of taxpayers and/or clientele. However, in Africa, where the strong, one-party state is currently predominant, objectives have typically been set by national-level politicians and bureaucrats in cooperation with their own experts and international donor organizations.

D. Obstacles to Institutional Change

Although both development objectives have changed over time, post-independence extension systems in Africa have tended to fall back on the strategies of the colonial era. This lag is in large part due to obstacles to institutional change.

Organizations do not always evolve efficiently (even in response to competition) due to "institutional rigidities" and "inertia". Firstly, historical precedents tend to limit the options in terms of organizational form because the "forces of existing institutions [are] one of the major forces impacting on the institutional choices of subsequent periods" (Nabli and Nugent, 1989, p.1343). Secondly, as Williamson indicates, "[g]etting from x to y...may not be easy." When institutional change takes place, "[t]he manner in which the associated benefits are divided is apt to give rise to intensive, self-interested bargaining" (Williamson, 1985, p. 21). In this regard,

Schmid's (1981) discussion of transaction costs relating to information is instructive. He argues that, "[w]hen the costs of change fall differentially on some groups, the potential losers often use their political capital to prevent the rule change. The prevailing ideology is that the costs of making mistakes is a useful incentive for prudent investment (p.88)." In other words the "wrong" type of institution will be avoided in the first place purely because change is costly.

In the case of colonial regimes in Africa, investment in agricultural supervisory services was not "wrong" given their set of objectives.[7] The need for change arose when independent governments introduced new objectives. In the case of extension, changing objectives, and thus institutions, often means relinquishing status, budget, staff - in a word - power. This has clearly been a barrier to institutional change in response to the broadening of extension objectives. For example, it is an obstacle to both an increased role for farmers associations and cooperation between Ministries.

Additionally, politicians may not be interested in seeing bureaus follow their "official" mandates. "The mandate is a collective expression of programmatic purpose, and individual politicians may not find its pursuit relevant to their own self-interests" (Moe, 1984, p.767). In Africa it may often be the case that the national extension mandate is not a "collective expression" within the country but is part of "playing the donor game". There may not be the political will to implement such mandates. Not only in terms of individual bureaucrats but as the national leadership as a whole. For, example the Ivorian Company for Textile Development (CIDT) in coordination with a World Bank supported cotton project in Cote d'Ivoire had in its mandate extension support for food crops. However, the project did a poor job providing extension for food-crops (and especially

7 As noted by Lin (1989), "For a given technology, transaction costs are of central concern in the choice of competitive institutional arrangements in a society. The institutional arrangement with the least costs in providing a given amount of service will be desirable" (p.27).

neglected female farmers) although it did very well with cotton (World Bank, 1988).

Thus, it is not sufficient to lay out new extension objectives and devise strategies to achieve them. A given strategy's value must be based on whether or not it can be implemented. Proposed new strategies must be analyzed in terms of the incentives for implementing them as perceived by different organizations involved in extension activities. As Lin (1989) points out, "[t]he change from an existing institutional arrangement to an alternative is a costly process; unless the net gains to individuals from changing to a new arrangement outweigh the costs of the change, a voluntary institutional change will not occur" (p.28). Some significant costs of change are transactions costs defined as "the costs of running the economic system" (Kenneth Arrow quoted in Williamson, 1985, p.18).[8] Although a precise calculation of the costs and benefits of institutional change is not possible, it is essential to consider them in order to devise useful future extension strategies.

E. Effectiveness and Sustainability

Two broad objectives for extension systems in Africa should be increased effectiveness and sustainability. Effectiveness refers to the extension system's ability to achieve the specific goals set for it. A sustainable extension system must have the following characteristics in order to continuously function at a fairly dynamic level of activity.[9]

- Financial Dynamism: the "ability to progressively generate financial resources from domestic sources to pay core operating expenses (Eicher, 1991, p.3)".
- Human Resources Capacity: the "ability to recruit, reward, and retain competent" extension personnel throughout their working lives (Ibid).

8 According to Bromley (1988), transactions costs have three incarnations: (1) costs of obtaining information about a particular situation; (2) actual costs of negotiation; (3) costs of enforcing the agreement once it has been reached (p.2).

9. For an in-depth discussion of sustainable agricultural institutions in Africa see Eicher (1989).

- Human Resources Capacity: the "ability to recruit, reward, and retain competent" extension personnel throughout their working lives (Ibid).
- Political Dynamism: the ability to generate political support both from clientele and politicians to ensure continuity of extension projects and programs without donor involvement.

In regard to financial dynamism, national policy should indicate whether the objective is to have an extension system which can be run independently of donor assistance or one which will be continuously supported by outside funding. If the objective is to have an extension system which is financially sustainable without donor assistance, the future availability of resources such as information, human capital, financial capital for investment, funds for operating costs, and facilities for education and administration must be considered when designing specific extension strategies.

Human resource capacity is developed through the establishment of strong pre- and in-service education and training and good staff management. A diverse range of skills are required but a key to sustainability is middle management capacity. A good middle manager is needed to maintain linkages with other organizations and farmers associations, trouble-shoot, and motivate field staff all of which are critical of effective implementation. The extension education aspect of the system must be strong to allow the other aspects to function well.

Political dynamism from the bottom-up requires relevant extension services, from the perspective of extension-clientele, including technical messages and other services. This a constant evolution of extension's "offerings". Continuing political commitment to extension from the top of the hierarchy is more likely to be based on successfully meeting targets set at the top. In order to achieve either sort of political support extension must maintain functional linkages with research, educational institutions, farmers organizations, and other organizations such as NGOs. Additionally extension must be backed up by supporting services, such as credit,

input supply, as well as accessible markets, if it is to be either effective or sustainable.

II. Organization and Management

A. Introduction

The organization and management of the extension system are crucial in terms of effectiveness (eg. demonstrated ability to achieve objectives) and sustainability.[11] Both well organized advisors/managers and adequate field staff are essential to implementing an effective extension system (Feder and Slade, 1986). However, bureaucracies find it difficult to undertake significant organizational changes while simultaneously focusing on the substance of extension (World Bank, 1989). Roling (1982) points out that "[f]ew extension administrators will refuse an effort to help train extension personnel;... [b]ut when it comes to discussing organization, there is usually reluctance" (p.111). However, as he goes on to note, it is difficult to improve staff performance with training alone.

This section will address both: (1) organizational issues at the top level such as structure of the extension hierarchy, and the size of bureaucracy; (2) administration of extension financing; and (3) human resource management questions including coverage, staff participation, job descriptions and performance, supervision and mobility, staff support and training.

B. Organization at the Top

1. Hierarchical structure

Most extension systems have a top-down structure, often similar to a military hierarchy with the field

11 Vengroff (1984) pointed out in his study of extension in Africa, that "Although diverse problems have been identified in a number of different nations, it is noteworthy that almost all analysts recognize organizational factors as crucially important" (p.46).

staff as foot soldiers. This system is part of the colonial inheritance and, as noted above, there are numerous obstacles to change. One obstacle to organizational change is asset specificity or fixity (Williamson, 1985). This concept helps to explain the "institutional rigidity" alluded to above. Essentially, fixity occurs when the cost of dismantling the existing structure cannot be offset by the benefits of potential alternatives. There are many costs associated with "dismantling" the current system, just a few are retraining and transferring field staff, and redistributing power among managers. The benefits of alternatives are often uncertain, and may not be convincing to those who must make changes work on the ground. There are numerous obstacles or costs to decentralization. In 1966 in Burkina Faso, then Upper Volta, for example a decentralized regional organization for development (ORD) was formed. Personnel shortages combined with the desire of educated personnel to live in the capital city made it very difficult to staff the regional offices (Vengroff, 1984). [12]

An additional element underlying the fixed nature of the top-down extension hierarchy is the motivation to minimize transaction costs. In general, administration of a top-down hierarchy involves fewer transaction costs than a de-centralized system and there are costs associated with institutional change. In Africa, where communication and transportation infrastructure are minimal, and skilled managers are a scarce commodity, the transactions costs of a decentralized extension system are relatively high. The benefit of decentralization is increased responsiveness to clientele. However, there is a difference between an inefficient fragmented system and a decentralized system where power is shared between different levels but the basic mandate is harmonized throughout.[13] An alternative to decentralization is a degree of privatization. Senegal is an example of a fragmented system being transformed into a top-down system in the public sector with increased privatization.

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12 Vengroff's analysis is based on data gathered between 1977 and 1979.

13 The Cooperative Extension Service in the U.S. is an excellent example of this concept. Schwartz and Warnakoolasooriya, 1991.

In Senegal there are currently extension services within at least five different ministries, six regional development agencies, and ten provincial inspections (PI) of agriculture. Funding for these various bodies is erratic and uncoordinated. In addition to government agencies there are 105 NGO's that implement their own programs with little monitoring from the government. There is little coordination between the various actors involved. In an effort to harmonize the system, measures being taken under the "New Agricultural Policy" include an increasingly national approach to extension programs, phasing out of some regional development agencies, increasing support for PIs, introduction of multi-disciplinary agents (particularly livestock and crops), decreasing staff numbers, and strengthening training and research/extension linkages as well as several measures to encourage more private initiative in Senegal's agricultural sector (World Bank field notes 1990, Bingen and Faye 1987).

2. Size of Extension Bureaucracy

The administration of a public sector extension service does require the existence of some bureaucracy. However, the appropriate size of that bureaucracy is a critical question (size is further discussed under the human resource management sub-section on coverage). An "optimal" size is difficult to determine.[14] For example, there may not always be enough new technology in the pipeline to justify the size of bureaucracy needed to disseminate existing technologies. Of course, bureaucracies expand far more easily than they contract and extension is no exception to the problem of bureaucratic bloat. An example of a large increase in bureaucratic size for little apparent benefit is given by the Ivorian cotton parastatal started under the World Bank supported cotton areas project.

14 The U.S. system provides an interesting example with few federal level staff (100) out of a total number of people employed (in 1982) of 16,733 (Warner and Christenson, 1984). "Over the past 25 years, personnel numbers have increased less than one percent per year (Warner and Christenson, 1984, p.12)."

In 1974 the government of Cote D'Ivoire entered into a partnership with CFDT and started The Ivorian Company for the Development of Textiles (CIDT). CIDT took over responsibility for cotton production but was also to be a regional agency for all rural development activities in northern and central Cote D'Ivoire (except for rice production and marketing). "CFDT continued to provide technical and marketing assistance for cotton" (World Bank, 1988, p.86). The staff grew from 1,211 total under CFDT in 1968 (including 30 non-Africans; 770 field agents) to 3,500 for CIDT in 1988 (27 non-Africans; 1,400 field agents) (Blume 1970, World Bank 1988). In addition to nearly doubling field staff, the largest personnel change has been the growth from 29 combined total administrative, managerial and accounting positions to 395 people working at HQ in Bouake. The rationale for this increase in staff was to strengthen managerial capacity to carry out the World Bank supported Cotton Areas Rural Development Project. However, expansion of services to food crops have been poor under this project.

Overall there has been tremendous staff "inflation" in Africa. Between 1959 and 1980 African countries added 1,000 new extension agents per year. This trend continues. For example, in NEPII in Kenya, approximately 7 times more staff were hired as field personnel than were deemed necessary under the original project design. The demand for civil service positions is high even although the main motivation is likely to be inside contacts and status versus salary. Most extension staff are paid little and many are paid erraticly or not at all. Benor cites that he recently met extension field personnel in Zaire who had not been paid in 3 to 8 years.

C. Administration of Extension Financing

A key challenge for extension policy makers in the quest for effective and sustainable extension is to identify alternatives to purely government funded services. The financial mechanisms used to meet the costs of

extension are a critical part of the organization of the extension system.[15] A discussion of extension financing must consider both the type and magnitude of costs and who will pay them.

1. Type and Magnitude of Costs

There can be substantial start-up costs of an extension system particularly for office buildings, staff housing, vehicles and overseas degree level training for upper level administrators. However, in some cases these costs are offset by infrastructure from the colonial period.[16] Incremental recurrent costs are the most daunting financial problem of public sector extension. These costs include: vehicles (purchase and maintenance), equipment and supplies (office and field), staff support (salaries, possibly housing, educational materials), training, travel, use of media etc. Excessively high recurrent costs mean that an unmanageable annual percentage of agricultural GDP is spent on extension operating costs. As noted in chapter two, the traditional T&V system which requires relatively intense coverage (800 farmers:1 extension agent) has been especially criticized in the literature for engendering high recurrent costs (Axinn, 1988).

2. Who will pay?

There are three main sources of funding for extension: (1) government funds from national, regional or local levels (drawn from taxes and supplemented with international donor funding); (2) clientele contributions (from organized farmers associations to individual gifts to field staff); and (3) private sector sources (eg. agri-businesses, banks). Some specific alternatives to public sector funding are: (1) direct contributions by agricultural corporations; (2) local banks; (3) cash crop processing companies; (4) cooperatives; (5) cesses on

15 "A particular task is to be accomplished. It can be organized in any of several alternative ways. Explicit or implicit contract and support apparatus are associated with each. What are the costs?" (Williamson, 1985, p.20).

16 In Nzega district in Tanzania the district extension office was the former British District Commissioners office. The regional extension headquarters were located in the old British "boma" or fort which also housed other government offices - such as the regional livestock offices.

exports/levies on imported inputs; and (6) local groups. [16] Financial support may be shared among different sources.[17] In each case there must be motivation to pay based on perceived benefits. Relevant options for contributing and the related motivations are discussed below for each of the three main funding types.

(a) Governments

In Africa, governments generally provide the main funding for extension services. Bounded rationality leads policy-makers to base their budget calculations on past experience.[18] If African governments have received significant external support for their extension programs in the past it is a rational expectation on their part that such funding will continue. Their rationality is bounded because they cannot be aware of future changes in the availability of funds. This affects the types of extension strategies that policy makers judge as reasonable from a budgetary perspective. For example, the World Bank has supported various projects in Burkina Faso with T&V components since the late 1970's. They currently have a Bank supported US$45 million Agricultural Services Project (24.7 million for extension) on-going through 1997. The government is only paying 6% of the initial cost of the project.[19] The failure of extension systems to maintain field supervision, adequate

16 In their overview of the Asian experience with T&V, Cernea, Coulter and Russell (1983) suggest that in the poorer African countries in rainfed areas the cost of an extension agent can be lowered by involving villagers in the selection and support of extension agents from their own communities. To the knowledge of this author, there are no large scale examples of local groups funding their own extension agents salaries in Africa; field level staff are however, frequently provided meals and small gifts during their visits.

17. The funding of the U.S. Cooperative Extension Service (CES) provides an example; 38% federal, 44% state and 18% local in the mid-1980's (Warner and Christenson, 1984). The Netherlands system is funded 50% by government with the remainder of costs covered by farmers' association members' fees and direct fees for services.

18 Bounded rationality means that as actors enter into agreements their awareness of "all future costs of the contract are limited because some critical information cannot be effectively processed, and other information is simply too expensive to obtain..."(Robertson 1990, citing Simon 1982).

19 The 1988 GNP of Burkina Faso was US$1.7 billion (calculated from figures in the World Bank, 1990, p.105). If expected recurrent costs of 49% of total costs are annual they will represent 1.2% of GNP versus the .15% of GNP the government actually contributed to the project at the outset.

staff support, and training may be due in part to policy decisions made under the assumption that recurrent costs will be covered by outside funding sources. If funding is not available, overwhelming recurrent costs may render much of the extension system ineffectual.

The willingness of African leaders to take on the recurrent costs of an expanded extension system can also be explained in part by the phenomenon of opportunism.[20] Opportunism, assumes that when one individual or organization has more information than another they will take advantage of that imbalance to benefit themselves. There are powerful social and political forces motivating those who are able to provide favors to political supporters/colleagues and to friends and family. Politicians and bureaucrats benefit from the existence of a large body of civil servants and big ticket development projects. They provide opportunities to give out employment, to funnel monies to certain areas of the country, to extract funds and equipment from donors, especially vehicles due to the intense need for transport in extension work. This may mean jobs, vehicles, travel opportunities, educational opportunities, money etc.[21] From a less cynical perspective, field staff provide a channel for staying in touch with rural populations and providing them with a wide range of services as big ticket projects provide needed resources, even if they are not sustainable and come tied to various donor ideologies.

(b) Clientele

Some of the burden of funding the extension system could be taken on by clientele at the local level. For example, Somalia is largely dependent on donor financing for its public sector activities. The government has problems covering the costs of providing housing for field staff and vehicle parts. Ideally, local arrangements

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20 An alternative explanation of this phenomenon is donor coercion. However, either explanation would be an oversimplification as neither side is entirely innocent.

21 This analysis is based on Moe's (1989) basic assumptions about the behavior of politicians and bureaucrats.

would be made whereby farmers, herders or community groups could either partly fund extension or in some way take over this function themselves. This has been done in Taiwan where the farmers associations provide extension services to their members. A model for mainly pastoral areas is the Range Management Areas (RMAs) program in Botswana where representatives of herders associations are given training and returned to the group to provide information and act as a liaison with veterinary services and other government agencies (LAPIS, 1990). The interesting challenge is to seek a mix of clientele accountability with public sector support.

Some options for clientele contributions to field staff support are provision of transport, housing, labor, or in-kind payment. To institute partial clientele financing, extension management (national and regional) and local clientele would have to work together to develop acceptable mechanisms for sharing operating costs of supporting field staff and evaluation of their performance. Understandably, farmers will not normally volunteer to pay for government services. However, if they receive a valued service, it is likely that they would be willing to contribute.[22]

A first step may be local involvement in selection of certain levels of field staff. An example is that of Botswana's Family Welfare Educators (FWEs) who are chosen locally, sent for training and returned to work in their home area. These FWE's were the most effective of all extension cadres in the country. Out of 21 villages studied 14 received "effective" FWE services. The three FWEs who were non-residents in their villages were considered ineffective and all residents considered effective. Comparatively, Agricultural Demonstrators (ADs) gave 7 of 21 villages effective services and Assistant Community Development Officers (ACDOs) gave only 5 of 21 effective services. ADs and ACDOs are ostensibly chosen on the basis of academic merit, sent for formal training and posted by the government. Possible reasons for the effectiveness of FWEs in addition to

22 A group of Senegalese farmers were willing to pay their extension agent rather than have him transferred and risk getting someone inefficient (Schillhorn Van Veen, personal communication).

local involvement in their selection are: they cover a limited geographic area and they have clear job descriptions and thus can focus their energies; they are 97% female serving a predominantly female clientele (Fortmann, 1985).

Local volunteers are also an option for community contributions. The U.S. system uses huge numbers of volunteers, "each year the 4-H and home economics programs alone involve over a million volunteer leaders..." donating ..."more than five times that of the organization's professional staff time.[23] Local support of extension should be accompanied by local evaluation of performance and involvement in the selection process.

(c) Private Sector

The private sector also finances some extension activities, often as part of a larger activity such as contract farming or ale of inputs. Private sector extension may be carried out by private voluntary organizations (PVOs), farmers' associations, agricultural cooperatives and commercial profit making firms (input dealers, processors/marketers, mass media and consulting firms). In the mid- 1980's some development experts, notably Peter McPherson the administrator of USAID, began to push for increased focus on private sector extension arguing that payoffs to public sector extension models were "disappointing". It was suggested that alternative ways of disseminating agricultural technology should be developed including private sector channels and mass media communications. A key aspect of this vision was the investigation of ways in which the public and private sector could complement each other. One suggestion made was for public sector extension and research to work on packaging research findings and recommendations to make them more accessible to private extension, input

23 The 1990 "Michigan 4-H Youth Programs" fact sheet put out by the Michigan Cooperative Extension Service indicates that the Michigan 4-H program alone receives nearly $US45 million worth of volunteer contributions (time travel and other resources) annually.

suppliers, and the media (McPherson 1985 and Claar 1988).[24]

Complete privatization of national extension systems is not desirable if there is a public service aspect to extension's mandate. Technology transfer is not the only function of extension and purely private extension would not be well suited to carry out social welfare and feedback functions.[25] According to Claar (1988), the constraints on the increased use of commercial or non-for-profit firms for extension work in developing countries are: (1) such firms tend to focus on a specific commodity; (2) they usually serve large commercial farmers; (3) they focus only on a single facet of the production process and do not address management skills or decision making problems as an integrated topic; (4) the objectivity of such organizations is often questionable; (5) usually payment of some kind is required from the farmer to the firm; and (6) they do not address the need for some sort of independent source of management training.

An illustration of the difference between private and public sector extension is given by two programs in Zimbabwe -- the Master Farmer Scheme (MFS) and private extension provided by Ciba-Geigy through a package program called Kohwa Pakuru (KP) ("get higher yields"). KP included financing for inputs, provision of inputs, training (of extension personnel and farmers) and marketing organization. The program reached large numbers of farmers in "better agro-ecological zones". However, the Kohwa Pakuru program trained farmers to use specific inputs only and focused on farmers eligible for credit from the Agricultural Finance Corporation. The MFS was concerned with training all farmers in all aspects of animal and crop husbandry (Chipika, no date,

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24 Some interpreted McPherson's message to mean that privatized extension should replace public sector programs and argued strenuously that the public sector's role as a provider of educational services to farmers via classrooms, experiment stations and extension services can be augmented by the private sector but never replaced (Findley, 1985).

25 In the process of technology transfer, "transfer should not be the major goal. The major goal should be the transfer of science or the capacity to generate indigenous technology, appropriate to the needs and circumstances of a developing society (Compton, 1989, p.114)."

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p.14-15).

However, private sector information supply services, or shared public/private funding of such services, can reduce the financial and managerial burden on public sector extension organizations. For example, private extension is already being used for highly specialized commodities such as tobacco, flowers, vegetables, dairy products and so on. Additional ways of combining private and public extension should be sought.[26] Governments will always bear some of the burden of providing information services even when a portion of the extension system is private - as is the case in most developed countries. To maximize benefits from extension's efforts governments must undertake a wide variety of support activities from rural infrastructure development to establishment of regulatory bodies to support for research, educational, and training facilities.

D. Human Resource Management

According to a study in Zaire by Vengroff (1984) the following items are the most serious hindrances to extension staff performance: (1) shortage of personnel; (2) lack of logistical backup (supplies, equipment, and transport); (3) excessive time spent on administration - especially report writing; (4) lack of contact between field agents and superiors; and (5) inadequate incentives. In this section the following critical human resource management issues are discussed: staff size; staff participation and job description; supervision; promotions and staff support; and training.

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26 In some cases there may be resistance to privatizing existing public services. De Haan and Walshe both pointed out that a constraint to privatizing or separating clinical livestock services and preventive or promotive services is that the front line agents have a vested interest in retaining the clinical services. An example of combined public/private extension for a specialized crop is the extension service provided by the Kenya Tea Development Authority which has begun paying the Kenyan MOA for the agents seconded to KTDA.

1. Coverage

The issue of coverage or size of field staff is first and foremost a policy question. The objectives to be accomplished must be known before the optimal number of field staff can be determined. The extent of coverage (i.e ability to establish direct farmer contact) should correspond to: (i) the characteristics of the area in which the population is located (the distribution of farmers over that area, the terrain, and the weather); (ii) the need for services in an area (a function of available and expected technology, the type of production system, and the policy goals for extension); and (iii) cost/benefit considerations.[27]

Some guidelines to farmer to agent ratios can be found in the extension literature. A 1962 conference on extension in East Africa suggested a general rule of "minimum ultimate objective...of between 1:350 and 1:1000" (DeWilde, 1967, p.172). In the French-speaking cotton producing countries the ratios of agents to farmers is much higher in cotton producing areas. In 1986 for farmers participating in cotton schemes the ratios were 1:80 in Cote D'Ivoire, 1:150 in Togo, 1:400 in Burkina.[28] The desirable size of field staff differs according to specific circumstances and fixed ratios (800:1 for example) are unrealistic. Farmer to agent ratios should not be dogmatically pursued targets. The "right" ratio changes over time as farmers, agents and the managerial system become more efficient (or less so).

Staff coverage is problematic in part due to incompatibility of use (eg. the use of a thing by one person excludes its use by another). McDowell (1985) points out that extension staff time is a resource which has incompatible use attributes. A severe constraint on extension staff is use of their time by individual clients. This

27 The type of production system has a major influence on the type of extension strategy appropriate for an area; for example, sorghum and cattle versus mixed high intensity dairy, maize and coffee.

28 The reason CIDT in Cote D'Ivoire gives for maintaining such a high ratio is the need for organized pest and disease control at the village level. However, they expect that the high ratios will be lowered as well-organized farmers groups are formed (World Bank 1988).

is a key issue in Africa. In the U.S. communication and information technology are applied to relieve this constraint, but in Africa this will only happen very slowly. Although, it is notable that even given modern technology "a large portion of the (US) program (especially agriculture) is conducted through individual contact with clients" (McDonald, 1985, p.12). can reduce the financial and managerial burden on public sector extension organizations. For example, private extension is already being used for highly specialized commodities such as tobacco, flowers, vegetables, dairy products and so on. Additional ways of combining private and public extension should be sought.[26] is needed coverage must be extended. One method for extending coverage which allows direct contact is to work with groups (see section 4 for discussion of groups). Another way of extending coverage which reinforces direct contact is through the use of the media.[29] The main types of media (small and mass) are: audio (radio, cassettes); written (books, pamphlets, newspapers/magazines/journals, hand-outs); visual (video, film, overheads, slides, photo stories); and theater.

There is general agreement in the literature that media should be used as a complement to personal contact with front line staff. Feder et al (1986) present results from India that "[t]he share of radio remains more or less constant regardless of access to extension services. This is compatible with the hypothesis that radio is a source of information that complements the role of the VEW" (p.21). During the Guided Change Project (GCP) in Nigeria, radio was used to inform local people about the details of the project. "...the radio programme helped in increasing farmers' knowledge about application dates, dates of delivery to the villages, special arrangements for late appicants at the central store etc." This function of radio was especially important under the GCP due to a "strong tendency on the part if some farmers to monopolize vital logistical information" (Huizinga, 1982, p.128). Radio is also helpful for reaching women who are too busy to attend meetings.

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29 It may be impossible to rely on the media to distribute relatively complex information. In Malawi, efforts to prepare materials describing the process of preparing and growing seedlings were futile. In the end posters were used purely to promote the idea of tree planting and instruction was done in person (Mitka, 1983).

Additionally, radio can help to create awareness and interest in extension activities among women.

Zimbabwe has an experienced video unit working on agricultural and livestock extension. The Agritex Video Unit was established in 1980 and produces tapes for both farmer and staff training. The unit had produced 150 tapes by 1985. In order to make content appropriate for specific areas the actual production of tapes is decentralized. This production approach requires training staff all over the country in the use of equipment and has lead to some problems with equipment maintenance.

Training in how to use the media to complement personal visits should be included as part of the curriculum at the Agricultural Colleges.[30] The key to effectively using media for agricultural extension is to dovetail different media and personal visits.[31] Marketing information can also be effectively provided through the media.[32] A key issue for the use of media over time is the pattern of investments in telecommunications systems. For example, if a telecommunications network is put into place that ignores poorer and marginal areas,

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30 A consultant on visual aids in Somalia has provided hands-on training to AFMET staff in how to prepare sample audio-visual aids using local materials; similar work could be useful in other countries.

31 World Bank field notes documenting a June 4, 1987 supervisory visit to Nyandarua District in Kenya (under NEP I), discuss the need for training materials on pyrethrum production. The crops officers were advised to prepare illustrated hand-outs on preparation of nurseries, planting, weeding, harvesting and drying and to publish them with the help of the Agricultural Information Center (AIC) or the Pyrethrum Bureau. Although these hand-outs were intended for use with staff, they could be designed to be useful for farmers also. Training should cover both design and how to coordinate a number of media efforts.

32 There is currently work underway in Mali to develop radio programming to inform farmers about market prices. An example of written material used for providing marketing information is published by the Marketing Research and Information Institute (IVRAM) in Italy. It is a brochure with useful advice on how to grade and pack fruits and vegetables. A similar brochure published by the Agriculture and Home Economics Evaluation Service (AID) in Germany which includes information on fruits and vegetables as well as information on storage, transport, marketing organization and marketing intelligence. These might not be immediately applicable but could be adapted to use in Africa. (Wierer, 1973)

it will lead to extension services skewed towards the areas where communication infrastructure has already been developed. However, good coverage alone will not yield an effective extension system. It must be accompanied by adapted messages, feedback from staff at meetings and farmers to staff in the field, and strong supervision (Drinkwater, 1987).

2. Job Descriptions

Staff will be more effective with reasonable job descriptions which avoid overloading field then with too many tasks. For example, CFDT moniteurs do not prepare demonstration plots because this would take time away from farmer supervision. However, their work does includes provision of inputs as well as close supervision of practices (timely planting, weeding and spraying) (Elliot, 1974).[33]

A central question regarding the duties of extension field staff is whether or not agents should supply inputs. The pro argument is based on the convenience of having the person who works most closely with farmers supply inputs to them. The argument for a "pure" extension agent is that he/she will not be overburdened with supply tasks.[34] As pointed out by Mosher (1978), the attention of agents who supply inputs will be unduly concentrated on those who are already using or want to use purchased inputs. Also, the extension agents may become politicized if they control input supplies. Field-level staff can however serve to inform and pressure suppliers to do their jobs properly. Extension's connection to input supply can be one of facilitating access. However, in a pluralistic extension structure it may be appropriate for agents to supply inputs in some areas.

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33 Each moniteur covers about 80 hectares (200 acres). Some CFDT agents also advise on rice in areas where cotton is predominant; working on developing a rotation in these areas (Elliot 1974).

34 The author's experience as an extension agent in Tanzania with input supply activities is that they are extremely time consuming and quickly become the focus of one's work. Especially if supplies are scarce, it is better to have the agent work to improve long run availability by helping farmers build contacts with suppliers than to go and get the inputs and deliver them to the village.

Furthermore, if an extension service "seeks to be responsive to farmer needs because it is accountable to farmers if committed to a participatory style" it may have to limit the content of its interactions at first to "referral services to specialists and specialist agencies which can help solve the different problems which are generated" (Roling, 1982, p. 99). After this phase technical information can be distributed. Additionally, it may be up to the group to decide if they want the agent to deliver inputs or if they want to set up other arrangements. They may be advised regarding the affect of different options on the schedule of visits a field worker can make and the content of visits etc.

Another job description issue is whether to have multi-purpose or specialized agents. This is again dependent on the objectives of the extension program in a given area. There is a tradeoff between one person who comes often to discuss one crop versus one who comes less frequently but can discuss more than one crop. A danger is that numerous agents coming to one farm may provide confusing and conflicting messages; or that some information will fall between the cracks and be covered by no one. DeWilde (1967) argues that if responsibilities are divided unclearly - such as education on recognizing signs of heat in a cow - it may lead to costly mistakes for farmers (eg. repeat inseminations). The field notes from NEP I in Kenya reveal that this is a serious problem on the ground. De Wilde suggests having a general extension agent with access to specialists who can advise him/her.

3. Staff Participation

Increased field staff participation in extension planning is a creative management technique which could be used more in Africa. At a workshop utilizing this technique in Kisii, Kenya (pre-1976), the majority of workshop attendees (22 of 26) felt participating in setting up course materials led to guidelines for training that were more appropriate for their working conditions. They were able to incorporate into the course ideas raised in the planning sessions. Field staff also identified more with a work plan that they helped make, which

enhanced their motivation (Schonherr and Mbugua, 1976, pp.19 - 20).[35]

4. Supervision

The quality of supervision requires serious improvement. Extension supervision visits often leave much to be desired, they tend to be short on two-way interaction and long on directives, speeches and reprimands. [36] Several factors affect visit quality: selection of supervisory field staff; managerial staff training in supervisory skills; and field induction period after formal training. To improve the quality of supervision, discussions with managers on their perceptions of supervision and how it can be improved should be included in management training workshops. Feedback should also be sought from the best front line people (and perhaps some of the worst) concerning their views on supervision. Such information could be used to develop materials for training. Involving agents in their own supervision is another way of improving field staff performance. Front line staff can be asked to plan part of the itinerary of supervisory field visits and send these to the supervisor before the visit. Hopefully, this will help focus the supervisor's attention on issues of concern to front line staff and also help to incorporate feedback time into the visit. Training on how to design such an itinerary and prepare useful feedback would have to be developed and presented at monthly training sessions, an FTC course, or informal pre-service training.

The impression given by numerous field reports is that the key to supervisor visit frequency is transport.[37] Logistical problems, such as slow procurement, are often partly to blame for poor supervision.

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35 To this end, one method is to have field staff assist instructors in preparing training materials for short courses.

36 "Although most supervisors were going through the procedure of making supervisory visits, they did not appear to know what their supervisory job entailed or how to perform it effectively" (World Bank, 1985, p.64).

37 A regional supervisor in the Michigan Cooperative Extension Service estimates that he spends the equivalent of 33 full work days per year doing work-related driving.

Slow procurement prevents vehicles from getting into the country on time and leads to a lack of mobility in the field.[38] Managers become preoccupied with getting transport to the detriment of other duties. When the continuity of supervision is interrupted and promised follow-up visits to staff and farmers are not made, both staff morale and credibility are damaged. To have the desired effect on front line staff, visits (even if infrequent) must be regular so that front line staff can plan for them and make the most of time with their supervisors.

5. Promotions

Promotion conventions which place good field staff behind desks weaken the extension system (De Wilde 1967). Alternative promotion options might include: (1) staying at the same job at increased salary; (2) staying in the same area as a manager; (3) additional training and return to the same area as an SMS; and (4) training and transfer to another area of the country with a more complex cropping system as a field agent. A variety of other incentives could be designed to reward good performance of managers and front line staff: (1) opportunities for study; (2) cash bonuses; and (3) bicycles/motorcycles (or parts). Staff could be surveyed on the rewards they prefer. In keeping with the general theme of increasing flexibility in extension systems, middle and upper extension managers should ideally be empowered to hire and fire, promote and transfer, and set up flexible pay scales (avoid paying agents directly in contact with farmers the lowest salaries regardless of their experience).[39]

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38 A key problem for many extension managers in developing countries is transport or mobility of field staff (Sigman and Swanson, 1984, p.10).

39 D.K. Leonard (1972) mentions that there were bars on inter-cadre promotion in Kenya. There should be mechanisms for firing people, especially if the extension service is overstaffed and the training institutes have too many graduates. However, it seems unwise to start firing people for poor performance if their salaries are not adequate to live on.

6. Staff Support

Staff need support in the form of transport, housing and salaries. Transport is an area which is difficult to improve from the field level. The key issues are maintenance and access. On the maintenance side, efforts could be made to build up capacity at the local level.[40] A possible solution would be to provide, as part of an extension project, support to local mechanics shops in the form of credit for equipment, training etc. Perhaps vehicle maintenance projects could be initiated by appropriate NGOs and coordinated with pertinent extension projects. In Somalia government vehicle maintenance workshops are supported by the AFMET World Bank supported project. To ensure that these workshops (and others similar to them) result in continued improvements in maintenance capacity over time, they should include: training of trainers; training on maintaining a stock of spare parts; and development of training materials.

In terms of access, clientele provision of a bicycle (or other appropriate conveyance) to the local extension agent may be a good way to introduce a degree of local accountability and to improve mobility. Staff housing is also problematic. In Somalia 196 front line staff houses have been completed and handed over to AFMET but maintenance has been a problem. Housing may be another aspect of support which the government could turn over to or share with the local community.[41]

7. Training

Extension training should impart skills in: (i) technical competence; (ii) diagnostic ability; (iii) communication; and (iv) team work. There is a need for improvement of training for staff both pre- and in-

40 BTORs mention frequently that there was no adequate garage near the District or Division office.

41 If projects do provide housing for field staff, it should be solid but appropriate for the area. Ostentatious housing can damage an agents reputation with clientele.

service.[42] For example, it is often the case that training is required to prepare extensionists and researchers to facilitate farmer group participation in the adaptive research process. Training capacity may be increased through both: (i) accelerated training of trainers domestically; and (ii) short term technical assistance for in-service training. However, just as it is not enough to have training without improved organization, it is not enough to have training without motivation. Mosher (1957) points out that SCIPA field agents in Peru were successful not because they were well trained in how to help farmers but because they were "able persons with basic agricultural training" (p.69).[43]

Training programs often lack both financial and human resources. In many countries funds for training are the first to be diverted to other uses when budgetary pressures occur. Many educators and technical specialists do not view extension and farmer training as an attractive job. Better use of technical resource people for training could be made with changes in incentives and opportunities. Following are several suggestions for improving training in the field or in FTCs.[44]

- Regularly evaluate the effectiveness of SMSs in extension training and make it a pre-requisite for promotion.
- Give the head position at FTCs to good administrators from government and/or universities or colleges and use it as a stepping stone toward higher posts. [45]

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42 In addition to these basics, off-season topics might include things like storage, health, food processing etc. In the particularly slack months of the year, there is time to do things like: workshops on audio-visuals; meet with (and integrate messages with) health and nutrition staff; study and carry out statistical analysis etc.

43 However horrid their circumstances (by developed coutnry standards), many of the extension agents I worked with in Tanzania, were highly motivated and worked hard to help the farmers.

44 For additional information on training see Cyril Barwell, 1975 which includes comments and suggestions from participants in workshops in Ethiopia, Uganda, Kenya, Zambia, Malawi, Swaziland, Lesotho, and Botswana.

45 Promotion to such positions as District Agricultural Officer (DAO) or Assistant Dean at an agricultural college or university.

- Bring talented field staff and university, college or technical institute teachers to training centers (such as FTCs) to teach a specific course and pay them honoraria. Guest trainers would have to adapt any recommendations presented to the conditions at the training site.[46]

- Use junior staff or university/college or technical institute students to assist SMSs and other educational resource people in organization and implementation of extension staff and farmer courses. Such "training assistants" might work with their teachers at the university or college to prepare training sessions or short courses as a part of their own programs.

- In terms of general motivation for FTC staff: (1) set salaries at a reasonable level; (2) make work at an FTC or in some other training facility a condition for promotion; (3) provide adequate guidance and supervision; and (4) implement thorough and unbiased performance appraisals which directly bear on promotion.

III. Extension linkages to other organizations and groups

The external organization between extension and farmers and extension and other organizations (such as research, universities, non-formal training facilities, input suppliers and marketers, and the donor community) is a crucial part of the extension system.

A. Research/Extension Linkages

1. Overview

Perhaps the most important aspect of the external relationships of extension is its linkage with research. Extension and research are mutually dependent (Whyte, 1975). Research provides extension with both a source of technical information and a receiving point for farmer feedback. Extension gives researchers knowledge of farmers' conditions on the ground and carries out vital information processing activities: adaptation, packaging,

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46 There are some problems with the idea of visiting trainers. Prospective trainers and assistants might have to travel a long distance from their regular jobs and/or have responsibilities preventing them from travelling. As an incentive, professors could be given a partial publication credit for work related to training field staff. There may be a language problem for guest trainers. This might be addressed by matching training interns to their work area according to language.

dissemination, monitoring, evaluation and feedback.[47]

Most efforts to create strong linkages between research and extension have so far been disappointing. One of many examples is the Unite Experimentale in Senegal. Although the project led to a better understanding of smallholders for both researchers and extensionists, "by the time the Unites program ended in 1980 no progress had been made toward the promotion of an on-going research and extension relationship" (Bingen and Faye, 1987, p.7). The failure to establish such linkages in Latin America led in part to the failure of U.S. efforts to strengthen the national extension systems in Latin America during the 1940's and 50's (Rice, 1971). In Asia, a review of the T&V extension system indicated that "higher priority needs to be given to the technical problems of rainfed farming; and feedback from farmers and extension staff is essential to ensure that research focuses on farmers' problems" (Cernea, Coulter and Russell, 1983, p.145).

A review of 128 World Bank research and/or extension projects undertaken from 1974 to 1980 identified five interlinked factors limiting project effectiveness:

- unclear national agricultural policy;
- limited country input into project design and a lack of coordination of research and extension activities with related work;
- a lack of understanding of sector or economy wide issues affecting research and extension;
- institutional separation between research and extension; and

47 "A good extension service does not exist without effective linkages to an agricultural research organization. A Research organization may be well rated by tradition-minded agricultural scientists, nationally and internationally...but the farmers don't read the technical papers and, unless the research program is effectively linked with some human service to bring the fruits of new knowledge to the researchers, and to bring the concerns of the farmers to the researchers, the organization's research output will only enhance the professional standing of its scientists" (Whyte, 1975, p.40).

- unclear statements of (or lack of consensus concerning), the various stages in the process of technology development and transfer (World Bank, 1985, p.8).

The same study identifies the following characteristics of the most successful projects:

- flexible methodology;
- close coordination of extension with other technology transfer services;
- participation of extension personnel in the technology adaptation process;
- institutionalized feedback mechanisms;
- clearly defined job descriptions;
- balance of attention to technical and educational skills.

Several additional factors affect R/E linkages. Firstly, the educational background of research and extension staff prepares them technically and also contributes to their professional attitudes and thus the potential for work together. This factor currently tends to have a negative effect on R/E interaction because researchers generally have more formal education than extension personnel and therefore look down on them. This is an issue which university, research and extension professional communities need to confront.

Second, incentives are needed to ensure that participation takes place from both sides and that it is quality participation. [48] This quality would means that research and extension personnel participating in each others trainings and other activities should be well-versed in the topic(s) at hand, reasonably experienced, and given adequate information to prepare for the activity beforehand. Some ideas on improving incentives are: (a) maintain a motivating professional environment (consistent management and adequate facilities); (b) provide adequate salaries; (c) tie work with committees and at meetings to receipt of bonuses and/or promotions versus

48. Several back to office reports (BTORs) from NEP I in Kenya indicate that research participation was weak at the regular (monthly) extension training. Representatives sent were junior staff and not well prepared to participate.

giving encouragement only to publishing papers.[49] Third, external and internal support mechanisms must be in place. In terms of sustainability, it is important to encourage a wide range of support mechanisms for R/E linkages such as cooperation with National Universities/Colleges, International Agricultural Research Centers (IARCs), and NGOs. These institutions can share resources, which are not limited to funding but also include staff (eg. as part-time SMSs), educational materials, housing and facilities for trainings. Who will pay for the use of facilities etc. can be decided on a case by case basis depending on the ability and willingness to fund R/E interactions on the part of participants. All of the sources mentioned under the discussion of alternative funding are possibilities.

2. Allocation of Funds

Comparing the budgets allocated to research and extension illustrate that up to now there has been a lack of recognition of the complementarity between them. For example, in East Africa there has been a high level of spending on extension relative to research - the opposite of the North American or semi-industrialized nations' experience (see Table 3). A main reason for this is that in low-income developing countries one can employ and support 20 extensionists at the same cost as 1 researcher (in industrialized nations, the ratio is 3 to 1 or less); thus if visibility and presence in the countryside is considered important, investments in extension receive priority.[50] Instead of training students at the post-graduate level to become research scientists, governments have focused on building extension systems with large numbers of relatively untrained and unskilled workers (Evenson, 1986, p.76). Increased emphasis should be placed on the complementarity between research

49 There is a danger to tying committee work to monetary reward as it dampens the incentive to reach a consensus and closure. Alternatively, provide an outside source of enforcement of local R/E linkages such as the District Commissioner. It is likely that involving such an additional person will only help if that person is committed to improving R/E linkages and is not partial to the managers of research or extension in the area.

50 These ratios are based on the on-going costs of support - not including the initial cost of education.

and extension versus viewing them as substitutes as has tended to be the case. Benefit/cost analysis should be used to determine if the desired returns to research and extension investments can be attained with a nation's available resources.

Table 3

Relative Expenditures on Extension and Research in Selected Regions[a]

	Extension			*Research*		
Region	1959	1970	1980	1959	1970	1980
East Africa	0.67	0.88	1.16	0.19	0.53	0.81
North America	0.42	0.53	0.56	0.84	1.27	1.09
Low income developing	0.30	0.43	0.44	0.15	0.27	0.50
Semi-industrialized	0.29	0.51	0.59	0.68	1.37	1.50

a/ All figures expressed as a percentage of the value of agricultural product.
Source: Evenson, 1986

3. Adaptive Research Mechanisms

In order to adapt research results from IARCs and/or NARS to suit different regional conditions, research/extension linkages must be in place to support adaptive research. The challenge is to marry farmer innovation with experiment station research. Adaptive research involves the adjustment of agronomic practices associated with a new variety or other basic innovation to make it appropriate for different agroclimates and socio-economic conditions.

In the 1950's in the extension literature on Latin America and Asia extension's role was discussed as primarily disseminating technology. Feder and Slade (1986), who estimated an internal rate of return of 20% for T&V extension in India, advised against investment in extension when appropriate technology is not available

(p.158).[51] However, it is now widely recognized that extension's role should be multifaceted including, among other things, provision of feedback, and involvement in the adaptive research process.[52] Extension staff are well-prepared to participate in adaptive research because they are in close contact with farmers, have a good idea of the real constraints farmers face and can use that information to tailor recommendations to fit different types of farmers.

A World Bank country study in Kenya found that more research is required on the information needs of the farming population (World Bank, 1989). This information gap exists in many countries in Africa. As a farm management specialist in Zimbabwe pointed out, most researchers don't first look at why farmers do what they do and go from there to develop new technologies. Rather, they come from outside and promote something inappropriate for the circumstances of the farming community (Drinkwater, 1987, p.23).

A key method for carrying out adaptive research is a network of field trials (Von Blackenburg, 1982). "The responsibility of trials may be with the research organization, but the village extension worker has to assist in the layout or even carry them out in his farmers' fields" (p.13). Trials may be managed by extension and implemented by farmers or managed and implemented by farmers and observed by research and extension staff. The essential element is the opportunity for interaction and exchange of ideas between farmers, extensionists and researchers.

In Botswana, the Agricultural Technology Improvement Project (ATIP) had the goal of increasing arable

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51 This estimate is for a scenario where investment in a given T&V project could be stopped at the point where marginal benefits are equal to marginal costs.

52. Much work has been done in this area at ISNAR under the direction of Deborah Merrill-Sands and David Kaimowitz (See Merrill-Sands and Kaimowitz, 1989).

production of resource-poor farmers who are mostly women. The key technique used to work with this group of farmers was on-farm trials supported by group discussion forums. The groups (made up of mainly women) were formed under the project and met monthly. After they were established the groups began to focus their attention on discussing options for farming systems improvement. At each meeting individual farmers reported on their farming problems and the group discussed them. Mid-season field visits were made to stimulate discussion. At the end of the season a formal assessment survey was done of the trials and the group process. Smaller more homogeneous groups worked out better. The meetings were especially useful for "clarifying the instructions for trials and creating peer pressure to implement. The discussions also provided exposure to trials for those farmers who were unable to carry out OFTs. The key to making the discussions useful was focusing on getting farmers to share their personal experiences in carrying out the trials" (Sagar and Farrington, 1988, pp.31 -32).

B. Farmer/Extension Linkage

The extension relationship with farmers in Africa tends to be rather one-way.[53] This circumstance raises again the question of the extension mandate. Is the objective of extension to act as a mechanism whereby innovations are disseminated among the farming population or is it to "liberate" the farmers through education as discussed by Wharton (1965), Williams (1967) and Schuh (1989)?[54] If it is the latter then the extension strategy must reflect that objective - especially in terms of the nature of the farmer/extension linkage. According to Williams (1967), the main functions of extension are: (1) the dissemination of useful innovations; (2) assisting in the application of such innovations; and (3) enabling people to use innovations and practical knowledge to better their lives. If the mandate of extension is truly to liberate, its functions must go beyond these three. It

53 As wryly described by Bunting, it is a relationship between the knowledgeable and the grateful.

54 Wharton made use of the word liberate in this context.

must enable farmers to be better producers and managers of their own enterprises. To meet this goal a one-way relationship will not suffice. Extension must work together with farmers to develop effective diagnostic and managerial methods for small-scale enterprises; and to identify and adapt technologies to suit their needs.[55]

A closely related issue is the need to develop extension capacity to learn from farmers and to pass the information on to researchers. Farmers have developed many advanced agricultural techniques on their own. For example, the Moru people in Southern Sudan employ a farming system based on the use of varieties with differing maturities to decrease the risk of crop failure. Additionally farmers often have very practical reasons for not following extension advice. When grounduts were introduced to the Moru in Sudan the cultural practices recommended were not well adapted. Excessively wide spacing resulted in rosette damage. The Moru farmers developed a closer spacing which protected plants from rain and other influences (Sharland, 1982). Another example is that of the farmers in Bungoma District, Kenya who were using closer spacing for cabbages than recommended. Farmers had chosen the close spacing because small cabbages were demanded on the market. Such an experiences indicate that it would be valuable to learn from farmers about their current cropping practices and their adaptations of research results to suit their circumstances. They should be given opportunities to develop their ideas with extension and research personnel in the field.

In order to pursue the broad objectives of more effective and sustainable extension for all farmers (small and large), effort must be directed at improving the farmer/extension linkage. The pure dissemination of innovations strategy is not effective and/or sustainable for small-scale farmers - especially in low potential areas.

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55 De Wilde noted in 1967 that there was "still insufficient emphasis on the need to convert it (the extension service) gradually into a means for two-way communication with the farmer." He goes on, "He (the extensionist) must be able to relay his knowledge of the farmer's thinking, problems and requirements so that those in government concerned with research, credit, requisites of production and marketing can effectively tailor their proposals for improvement of agriculture to the farmer's needs and limitations (p.163)." For a discussion of a related idea see Byerlee and Hesse de Polanco's 1986 discussion of "step-wise adoption".

Especially important is the need to increase extension's local accountability and to ensure that services provided are perceived by clientele as useful. One result of improving this linkage should be increased extension focus on mobilizing and supporting farmer's organizations. DeWilde (1967) argues that, effective extension work requires close association with the farmers' organizations (p.167). [56]

1. Farmers' Organizations

Farmers organizations (FOs) can take many forms. They can be large national semi-political bodies, such as the Kenyan or Zimbabwean National Farmers Unions, or small church associated groups such as the Chikuni Fruit and Vegetable Cooperative in Zambia. They fulfill a variety of functions and can be very effective in providing services to members. The following list is not exhaustive but offers some ideas for how farmers organizations can contribute to extension sustainability.

- By creating an organized voice to articulate felt needs of the farming community, or parts thereof, FOs help to make extension policy demand driven.
- Through lobbying for financial support for extension FOs can help to prevent cuts extension funding.
- FOs are organized bodies which can send representatives with feedback to meetings and training sessions of research and extension staff.
- FOs provide an alternative to frequently ineffective and inefficient parastatals to facilitate input supply and marketing.[57]

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56 Work with farmer's organizations can be politically threatening. An example is given by a French NGO working to teach local people skills for initiating community action. The Maison Familiale is a French NGO which currently still works in some W. African countries. They went to Cote D'Ivoire in the 1960's at the invitation of local community leaders. Their work focused on teaching people organizational skills and communication skills to strengthen their ability to not only make their voices heard but to start to actualize their goals. After its initial UNICEF funding expired, the government did not continue funding for the Maison Familiale despite local farmers organizations requests that they do so. (Source Elliot, H.J.C., 1974, p.18).

57 "In 1986 more than 77% of cotton production was handled by 333 village groups, compared with 52% and 192 groups at project completion (1980/81)." Payments to these groups for their services "amounted to...about

- FOs can easily participate in group extension activities.
- FOs can participate in or control the selection, support and evaluation of extension staff. [58]

2. Extension work with Groups

Work with groups, formally organized or not, is an effective way to reduce the cost of information per farmer and to improve access to inputs and other services. Some specific advantages of work with groups are: expanded coverage of field agents; people share experiences; better decision making; people may feel freer to express themselves when they are in a group[59]; helps overcome social pressure; decisions more likely to be enacted (groups more likely to implement new ideas without intensive follow-up than individuals); facilitates competition; leads to dissemination of ideas (both within the group and after people leave and describe the meeting to others); groups can share labor; easier to plan for contact between the agent and farmers; can purchase inputs, do marketing together, and save on transport and other costs (Ndimande, 1987).

In Chiwindura, Zimbabwe the most effective groups are organized to provide some of the member's resource needs as opposed to purely disseminating information. Agritex (The Zimbabwean extension service) has helped encourage group cohesiveness but "the ideas that some groups have of how they can benefit their members are more appropriate than those currently employed by the extension agency" (Drinkwater, 1987, p.21). In some groups, farmer leaders are sent for training. Ideally, leadership is rotated and members of the groups

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US$5,000 per group. In the northern region, almost 100% of cotton production is marketed by to CIDT by village groups (World Bank, 1988, p.87)".

58 A practical handbook which could help field staff encourage participation is "Participatory Monitoring and Evaluation: Handbook for Training Field Workers." (Stevens 1988) The "booklet contains a guide for training field workers to assist village groups who want to develop a monitoring and evaluation self-help system as a tool for learning from experience and for use by those who are also beneficiaries of a project or program." (Tropical Abstracts V4(6):99)

59 This may seems counter-intuitive but it is the case in some cultures.

rotate as trainees. Some farmer leaders are very competent. However, according to extension workers in Chiwindura, there have been some problems with farmer leader training (FLT) due to: (1) illiteracy - some farmers do not like to attend as they doubt their ability to communicate lessons well upon returning to the group; (2) some trainees delay reporting back; (3) the capability of farmer leader trainees may be doubted by extension agents; (4) leadership is not rotated properly. Groups can be difficult to set up and require innovative organizational strategies and political leadership. However, working with already established groups is one way of limiting such problems (Stavis, 1979).[60]

As mentioned above the formation of groups can enhance the coordination of marketing output. An example is set by the Chikuni Fruit and Vegetable Producers' Cooperative Society in Zambia's Southern Province which was started in 1970 by a Zambian nun. The group produces and processes and markets fruit and vegetables. In 1984 the group had 70 paid up members (all subsistence or "small emergent farmers") as well as many spouses involved as members by association. The Society owns and operates a processing factory, cultivates a vegetable garden near the factory as a demonstration plot for members and sells seed to members. Members grow produce on their own land, they receive advisory services from a female extension agent seconded to the Chikuni Cooperative Society by the Ministry of Cooperatives (Milimo, 1985).

The size of the group has a lot of bearing on the structure of group sessions and how many visits the agent

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60 The field reports from NEP I contain 2 interesting cases of effective self-started farmers organizations. In Meru, Timau Division, Ngarindari Location the farmers have organized themselves and are carrying out a diverse set of tasks on their own. The extension agent (Technical Assistant - TA) in the area is very good. (BTOR, NEP I, Oct. 1 - 2, 1986) In Kilifi (Dist), Montondia (Div), Bahari (Loc), Gonze (Sub-Loc) there is an interesting self-initiated group of dairy farmers. (BTOR, NEP I, Aug. 13 -14, 1986) Groups such as these should be supported - not taken over - by extension. It would be helpful to know how these groups got started and what keeps them going. Some factors to consider in investigating such cases are: the farmer's social organization in the area; the strength of leadership at the Division or Locational level; the source of the field agents motivation. If the same person is still there he/she is a good candidate for assisting with training others.

agent can make in a set period. However, there is no "correct" group size. Group size can vary greatly depending on clientele interest and the skills and materials at the disposal of extension agents. Group structure may vary from a contact farmer (CF)/follower farmer (FF) format to a group of all equal members with a rotating leader who is voted for by all members. The extension agent must decide how to work with the group. Will he/she work only with the CF or use the CF as an organizer and try to work with the whole group? "Major attention has to be paid to the danger of unequal benefits to contact and follower farmers" (Von Blackenburg, 1982). Roling (1982) reports that many extensionists from countries where T&V has been implemented indicate that the "contact farmer approach is old wine in new bottles, in that the 'progressive' and 'registered' farmers of the past are now the contact farmers" (p.106).

Contact farmers who are not representative of the norm in an area should not be chosen because they will not be effective (De Wilde 1967).[61] Beyond that, extension agents should be trained in both how to pick CFs who they can really work with to facilitate the two-way interaction described above. However, when field staff are poorly paid and supported they have an obvious incentive to pick CFs who can help them financially in return for extra services. This is one reason for increased cost sharing of field agent support and local authority over choosing CFs. There is, of course, the danger that relatively powerful local people will take control of the process.

There are many techniques for extension to work with farmers groups. Whyte (1975) suggests the

61 I participated in the selection of CFs for a pilot T&V project in Tanzania in Nzega District. The selection committee included, myself and my counterpart (the Ward Extension Officer), and several local party officials. We picked those influential people in the community who were good farmers and well respected, as we had been instructed at the orientation. The party secretary and my counterpart were hard-working people dedicated to their jobs and they really thought hard about who would be appropriate.However, there was no local input into the selection process. It is notable that, if I had not been there no women would have been chosen. Even so, the pilot project fell apart shortly thereafter due to financing difficulties.

concept of a farmer group leader who is an "educational liaison". The farmer is selected from his/her own community, sent for training and returned home to act as a teacher and often a motivator. [62] One way of improving the extension/farmer linkage is to include farmer group leaders in regular extension training meetings. Farmers could attend meetings and then transmit the messages informally to their peers. The front line agent would then reinforce the idea and act as a "trouble-shooter" for farmers adopting the new technology (Drinkwater, 1987, p.23).

C. Universities and other Training Institutions

1. Benefit of Linkage

In addition to strengthening links with research institutions, extension should improve linkages with universities and other training institutions. The extension/university link is important because it orients research and education to solving actual farm problems; keeps the agricultural universities in touch with rural and agricultural constituencies, policies and technological requirements; puts universities "in a position through adaptive research to improve the supply of research information to extension and through in-service training to improve the technical abilities of agents" (Van Crowder, 1990, p.2).

The potential advantages of such links are:

- To stay abreast of innovations being developed at universities in order to have new information for farmers and to help scientists in academia get feedback from farmers;
- To coordinate activities of extension, research centers and universities to avoid duplication of efforts;[63]

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62 To implement the "educational liaison" idea it is necessary for development planners to consider: (1) How is the appropriate person to be chosen?; (2) What incentives should the trainees receive (material and non-material)?; (3) How much and what kind of training would they require?; (4) How can extension and other services best play a support role for the returned trainees and their groups? (Whyte, 1975).

63 For example, university scientists might do basic research and the first stages of adaptive work in association with the central laboratories of national research bodies. Then the regional research stations might carry on the adaptive work in cooperation with extension staff and farmers.

- To make curricula more practical; and
- Establishment of university-operated agricultural economics think tanks with extension responsibilities.[64]

2. Extension Education

Ministerial training programs, Agricultural Institutes, Colleges, and Universities are responsible for educating extension managers, trainers and field staff, preparing teaching materials and providing specialized courses. Thus, actions to strengthen these institutions concurrently with extension projects are in order.[65] There are two primary changes that should be made in the objectives of agriculture and extension education in Africa. First, the curricula should be adapted to prepare students for alternative careers to the civil service, for example in the private sector. From 1960 to 1965 there were only 65 graduates with degrees in agriculture from Makerere University in Uganda (the only institution between Kenya, Uganda, and Tanzania giving an ag degree up to the late 60's) (De Wilde, 1967). There are currently approximately 700 annual recipients of agricultural degrees or diplomas in Kenya. Alternative training would alleviate part of the problem of an oversupply of agricultural graduates in relation to the current requirements of Government Ministries. A good model for such a program is the Student Enterprise Project in Lesotho (LAPIS, 1990).

Second, training for field agents (both formal and in-service) should concentrate more on extension management, extension methodology (i.e. how to encourage participation), diagnostic skills, farm management and marketing, adaptive research methods, team work with research, moderating discussions, and use of media

64 These could be attached to (and located together with) research units carrying out agronomic adaptive research in the field and would work analyzing the benefit/cost implications of various alternatives. They could also work on developing training for field staff to improve their diagnostic and analytical skills.

65 Such as USAID's Manpower Development project in Uganda.

channels for communication.[66] Finally, follow-up after training is important to ensure that new skills are put to use.

The level of education required for field staff is open to debate. The World Bank (1985) asserts that it will be necessary to "progressively raise the education level of...field staff to help...farmers adopt new technology more rapidly (p.65)." It is argued that when agriculture develops, field staff need more than a secondary school education. Additionally, if high school graduates are hired now they may be with the extension service for 20 - 30 years. They may be adequate for working on simple technologies now but will they be able to fulfill their duties later? Other authors contend that more highly educated field agents are relatively less effective as they have higher expectations for income and other benefits than are likely for front line workers.

Good personnel management is the key to selecting and placing staff members with different skill levels. If the job requires complex diagnostic skills and farm management advice (possibly including the use of a computer or other equipment), highly skilled staff are needed. In areas where very basic innovations are being recommended and baseline information is being gathered for feedback, it may be appropriate to have staff with less education.

3. Adapting the Field Staff Curriculum

Different types of training are needed for different jobs, for different areas and even within a given area. As Roling (1982) points out it is fairly impossible to train a field officer with the same skills for serving both small-scale and large-scale producers. Von Blackenburg (1982) argues for more attention to training of

66 Video and other visual aids such as slides can be used with on-farm practical follow-up. Technical information can be covered first in the video or slide show with a cassette audio. On-farm practicals should follow immediately with a wrap-up discussion held in the field to reinforce and clarify the material covered.

extension SMSs and other higher level extension staff and research officers (p.13).

(a) Management

Nearly all the World Bank task managers working on extension and research projects in Africa agree that management of activities supported by such projects, is weak. The need for management training is recognized by numerous authors and experts (Oram 1985, Claar 1985, Compton 1989, Venkatesan PC). An agricultural agent from Zimbabwe argued that in his country, "the main problem is that we are mainly emphasizing technical know-how, but we are not really putting any emphasis on management" (Drinkwater, 1987, p.22).[67]

All students intended for managerial positions should undergo a field induction. They should be involved in management workshops during this period. Students might work as field agents for a year in a given area, be given housing locally, a food stipend, and pocket money. This would help keep costs down and would provide future managers with field experience.

(b) Facilitating Participation

Additionally, training to encourage participation is lacking. To address this problem it seems most relevant to have courses that combine sociology with hands-on communication labs (preferably with real groups in the field).[68] Improvement of adult education skills, communication and group process skills is essential.

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67 One method of providing such training in-service is through management training workshops for management trainers.

68 Participation may be poor for other reasons than just poor communication skills. In the following example the problem was poor extension management. The farmers at Olijoro Orok, in Nyandarua Kenya, were supposedly very difficult "non-participation" farmers. They were brought to a meeting during a field visit by an NEP I supervisor, they participated very well and said they were interested in participating on a regular basis. The problem with their participation had been caused by: (1) inconsistent day and time of JTA/TA visits (which

There is a huge body of literature available on these topics which are beyond the scope of this paper.

(c) Diagnostic Skills

Diagnostic skills are stressed as a weak point by several authors and field reports. The primary task in this regard is to upgrade training to the point where field staff can assess a problem, or know who to ask, after observing a problem in the field. An additional aspect related to proper constraint diagnosis is contact farmer (CF) selection. Von Blackenburg, in his study of Sri Lanka (1982), found that field agents should focus on the following two characteristics when trying to identify contact farmers: (1) appropriate farming standard (between traditional and progressive); and (2) ability to convey messages to other farmers. Although farmers may actually choose the CF, the agent needs these diagnostic skills to be a good moderator of the process.

Farm management training is an important avenue for increasing the agents ability to offer services that the farmer really needs. For example, in Zimbabwe, recommendations to farmers in the Chirumhanza area in the Midlands were found to be such that given climate, labor and resource constraints it would be very difficult to make a profit using the full recommended input package. As Drinkwater (1987) points out, even if farmers savings groups are formed to overcome finance constraints, this would not help unless the recommendations are economically viable.

In a study of the acceptance of various innovations, Collinson (1968) reports that, "the debt ceiling of the small farmer may be an initial obstacle to his accepting a recommended practice" (p.55). Extension and political pressure can force farmers to accept a new practice despite reservations. However, such actions cannot

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could have been exacerbated by a lack of transport and supervision) and; (2) a lack of interesting messages except at planting time and other key periods in the cropping season.

sustain use of an innovation and can be "economically and politically expensive in the long run" (Ibid.,p.55). The alternative is to educate the farmers to handle a new innovation: (1) as a farm manager and (2) within the context of the economic environment he/she is faced with. Field staff should be trained to enable farmers to identify "bad" messages (in terms of their resource allocation) and reject or adapt them as they see fit.[69]

(d) Teamwork and Professional Attitudes

Teamwork and professional relationships between extension and research could in part be addressed by the development of a series of courses covering these topics under the formal curriculum. Such courses should be required for students from different disciplines, (crops and livestock, research and extension), include field exercises and focus on building positive professional relationships. The courses could be designed by a sub-committee of the research policy advisory body made up of university, research and extension staff.

As noted in chapter two, a problem with the community development approach was the professional attitude of the extension personnel toward local people. This could be improved through more appropriate education and training. Roling (1982) points out that the "diffusion of innovations" theory which holds that laggards have only themselves to blame for not keeping up with the progressive farmers, is still taught widely to extension personnel. Promotion of more appropriate professional attitudes can be highly influenced by the formal education process.

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69 The recent ARETP mid-term review mission to Sudan found that there continues to be a need for work on the farm level economics of recommendations; intensive training for SMSs in farm management economics was recommended. Additionally, front line staff should be trained to point out to farmers the advantages and disadvantages of a new technology translated into financial terms. For example, curriculum could include practical exercises such as doing partial budget analysis of recommendations case by case together with the farmer. Perhaps the current farm management training program for field staff put together by CIMMYT can be adapted to local circumstances by African agricultural economists.

(e) In-service Training and Follow-Up

Staff should be trained early on to moderate discussions and encourage a participatory atmosphere during in-service training sessions and all group meetings. The result of such training would ideally enable them to project an image of facilitating rather than controlling sessions they will organize. When in-service training is carried out by short term consultants, provisions should be made for training of selected staff members to carry out similar training later. The consultant should prepare teaching materials together with the local staff who could practice doing some of the teaching while the consultant is present.

Follow-up after training is important to ensure that training (especially overseas) is put to use on-the-job.[70] Two possible steps to take in preparing for the return of a staff member in training are: (1) send him/her a questionnaire every year (or more often) during the training time to get an idea of what he/she is learning; (2) make arrangements for the organization to use the person's new skills most effectively on his/her return.

D. Input Suppliers and Marketing Services

A central question in the debate over extension strategies is whether or not agents should supply inputs to farmers and market output. The pro argument is based on the convenience of having the person who works most closely with farmers supply inputs to them. The argument for a "pure" extension agent is that he/she will not be overburdened with supply tasks. Input supply activities are extremely time consuming and can quickly become the focus of extension work. Especially if supplies are scarce, it is better to have the agent work to improve long run availability by helping farmers build contacts with suppliers than to go and get the inputs and

70 Several countries have had some problems with overseas training components (long and short term) financed by donors. Some trainees did not return to their jobs after training. They went to work in other places, in part because no provision was made in the project design for them to have stimulating and relevant positions after they returned from training.

deliver them to the village.[71] As pointed out by Mosher (1978), the attention of agents who supply inputs will be unduly concentrated on those who are already using or can afford to use purchased inputs. Also, the extension agents may become politicized if they control input supplies. Frontline agents can, however, serve to inform and pressure suppliers to deliver needed inputs. Extension's connection to input supply should primarily be one of facilitating access. However, private information supply to farmers is often combined with inputs, credit, marketing services and so on. Whether or not extension or advisory services should be combined with other services must be decided on a case by case basis.

If increased production is the goal of extension, access to markets is essential for continued adoption of extension advice. If there are problems such as late payment for crops or failure to pay, lack of storage, communication and transport infrastructure due to poorly functioning parastatals or cooperatives, farmers may understandably lose interest in a crop advocated by extension. Thus, two relevant tasks for extension are interacting with marketers of agricultural and livestock products and the provision of marketing advice; this can often be most efficiently done by using mass media such as radio. According to Wierer (1973), a market advisory service should provide advise on market outlets and marketing techniques (such as interpretation of price information, adjusting production to meet quality standards etc.).[72]

Two approaches for getting farmers involved in the marketing aspects of farm management advice are: (1) involve the farmer in a survey and have him/her prepare records of the business (sales prices and volumes, storage losses, yields of processing) which can be evaluated and discussed together with the agent; and (2) plan

71 The key issues regarding input supply are: availability, timeliness, affordability, reliability, and appropriateness.

72 Marketing of output from traditional areas was not provided for under the British system. In Kenya and Zimbabwe it was very hard for small farmers to market surplus product.

and organize with the farmer(s) some "test sales or trial shipments of products which are better graded or packed or with new kinds of products, or to various markets where he/she did not sell before" (Wierer, 1973, p,208).

E. Donor Community

Coordination both between national extension administrations and donor organizations and among multiple donors are important. If multiple donors are uncoordinated they may implement contradictory projects in the field leading to confusion and impaired credibility. On the other hand, donors can reinforce each others' work if they coordinate activities to enhance their different comparative advantages (e.g. NGOs ability to work at the grass roots versus large donors' ability to fund major infrastructural change).[73] A mix of donors is needed to enable the strengthening of both national and smaller scale community-based extension activities. National projects generally have relatively macro objectives such as increases in production leading to increases in national income. In the case of projects of national scope, larger donors may be more capable of funding required training programs and other follow-up activities. NGOs are able to design smaller projects which often have as their main objective improvement of the quality of life of small farmers with little measurable effect on national income.

Some reasons why donor supported programs fail: inconsistent programs (stop and start); redundant programs (lack of institutional memory); poorly planned programs; a lack of coordination between the donors themselves and between donors and national government; and political upheaval and/or war.

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73 There is increasing emphasis in stated extension objectives of African governments on "providing income-generating opportunities for small-scale producers". However, "The objective of helping rural people to organize and become aware of their situation is often pursued more by NGOS than by government" (Roling, 1982, p.91).

IV. Summary

This chapter focuses on three basic elements of the extension system with special emphasis on the effect of institutional forces on both the current form, and possible future forms, of extension systems. Each element is discussed in terms of its importance in the system, possibilities for improvement, and how the institutions neglect some participants.

The first section focuses on the need to design extension strategies in accordance with specific objectives. There are many alternative objectives and they are subject to change based on economic, environmental, and/or political influences. Therefore, the extension system must be flexible and based on a philosophy of pluralism. Such an extension system can employ different strategies as needed and avoid blanket implementation of one strategy such as has happened with T&V in Africa during the 1980's.

The overall extension mandate theoretically may be set at the "top" or from the "bottom". In actuality the mandate setting process is ruled by the balance of power and the political arena within a given country (which includes the client groups, politicians, civil servants etc.).

The evolution of the extension system is a process of institutional change. There are many barriers to institutional change: the force of historical precedents (eg. institutional habits); potential losers will fight proposed changes (eg. politicians who stand to lose power); and stated mandates which conflict with mandates of individual bureaucrats. To know if proposed changes are realistic must consider the cost/benefit balance.

In the evolutionary process of extension two broad objectives should be focused on: cost-effectiveness and sustainability. The criteria for a sustainable extension system are: (1) financial dynamism or the "ability to progressively generate financial resources from domestic sources to pay core operating expenses (Eicher, 1991,

p.3)"; (2) human resources capacity or the "ability to recruit, reward, and retain competent" extension personnel throughout their working lives (Ibid); and (3) political dynamism or the ability to generate political support both from clientele and politicians to ensure continuity of extension projects and programs without donor involvement.

The characteristics needed to meet these criteria are political commitment, strong organization and management - especially middle management capacity, clientele support, flexible institutional structure with functional linkages to other organizations, and strong pre- and in-service training. Clear commitment to running extension independently of donor assistance; ability to analyze the feasibility of specific extension strategies in terms of the future availability of resources; and relevant content of extension services from the perspective of extension-clientele. Additionally extension must be backed up by supporting services, such as credit, input supply, as well as accessible markets, if it is to be either effective or sustainable.

The internal organization of extension from administration of financing to human resource management must be improved if extension systems are to achieve the goals of sustainability and increased effectiveness. The hierarchical structure of most extension systems is top-down hierarchy and the costs of dismantling the structure can prohibit decentralization. The benefits of decentralization are increased responsiveness to clientele. Although there is no optimal size of bureaucracy, careful attention should be paid to the tendency for bureaucracy to expand excessively - particularly due to the difficulty of shrinking it later.

Creative alternatives are needed to purely government funded services both to pursue sustainability and also to incorporate local accountability. Incremental recurrent costs are the most daunting financial problem of public sector extension systems in Africa. There are three main sources of funding for extension which can share these costs: government, clientele, and private. Governments make the main contribution and base what they can afford on past availability of funds. If donor funding was decreased significantly; governments would

have to change their budgeting for extension and thus extension strategies would also change. Clientele could take on increased responsibility for extension funding; especially in the areas of housing and transport. If they do so they must also have increased participation in evaluation of extension performance. Privatization is also an option but should be used to complement public sector services and not to replace them.

Human resource management covers a myriad of extension issues - with special emphasis on field level management. First, staff size and the extent of coverage should be based on physical and demographic characteristics of an area, the need for services in that area, and benefit/cost considerations. Various methods of increasing staff coverage are possible, including work with groups, and use of the media. The media should be used to complement direct contact with field staff. Second, job descriptions of field staff should avoid overloading them with too many tasks. They may take on tasks in addition to advising but total responsibility for input supply and/or marketing should be avoided. Third, staff participation in extension planning should be increased to enhance motivation, improve training and increase program relevancy. Fourth, supervision should be improved in terms of quality and quantity. A major obstacle to this is the availability of transportation. Fifth, promotions should not automatically move good field staff to desk jobs. Creative alternative rewards should be sought. Sixth, staff need support in the form of transport, housing and salaries. Transport and housing could be provided locally and are thus areas where local people can make increase their contribution to extension costs. Training is an area which needs much strengthening. In order to provide better training to staff various changes must be made in the incentive structure to resource people, and the organization of training centers.

Functional extension linkages to other groups and organizations are a crucial part of the effectiveness of the extension system. If extension is to take on a broad mandate which includes the "liberation" of farmers through education, it must enable farmers to be better producers and managers of their own enterprises. To meet this goal a one-way relationship will not suffice. Extension should work together with farmers to develop

effective diagnostic and managerial methods for small-scale enterprises; and to identify and adapt technologies to suit their needs. One result of such an improved linkage with farmers should be mobilization of and support for farmers organizations. Work with farmers groups, both formal and informal can help to extend extension staff coverage and help to decrease costs.

Research/extension linkages are perhaps the most important aspect of the external relationships of extension. The funding of research and extension activities should take into consideration that they are both part of the same agricultural knowledge information system and complementary not substitutes. Adaptive research is essential for developing technical messages which are suited to the specific needs of farmers in different areas.

In addition to strengthening links with research institutions, extension should improve linkages with universities and other training institutions. There are two primary changes that should be made in the objectives of agriculture and extension education in Africa. First, the curricula should be adapted to prepare students for alternative careers to the civil service, for example in the private sector. Second, training for field agents (both formal and in-service) should concentrate more on extension management, extension methodology (i.e. how to encourage participation), diagnostic skills, farm management and marketing, adaptive research methods, team work with research, moderating discussions, and use of media channels for communication.

Extension also has a linkage with input suppliers and marketers. In this regard, a central question in the debate over extension strategies is whether or not agents should supply inputs and market output. As noted above, extension staff should not be solely responsible for input supply. They can, however, serve to inform and pressure suppliers to do their jobs properly. Extension's connection to input supply should primarily be one of facilitating access. Regarding marketing, two relevant tasks for extension are interacting with marketers of agricultural and livestock products and the provision of marketing advice to farmers; this can often be most

efficiently done by using mass media such as radio.

Linkages between national extension administrations and donor organizations and among multiple donors are important. If multiple donors are uncoordinated they may implement contradictory projects in the field leading to confusion and impaired credibility. Chapter four applies many of the concepts and recommendations raised in chapter three to the specific problem of reaching resource-poor farmers in Africa; focusing on women and pastoralists.

CHAPTER FOUR - REACHING RESOURCE-POOR FARMERS: WOMEN AND PASTORLISTS

I. Introduction

This chapter presents a discussion of the problem of providing extension to resource-poor groups by honing in on two typically resource-poor groups: women and pastoralists. The challenge of serving these groups represents two current challenges for extension. Resource-poor farmers are inadequately served by current extension strategies in Africa. In particular the idea that delivering a new technological innovation(s) to these farmers can in and of itself result in raising their productivity to subsistence or surplus levels is incorrect. The appropriate extension strategies for providing effective and sustainable services to resource-poor farmers are different from those for other clientele groups such as: tea and intensive dairy enterprises, or irrigated lowland rice farmers. This does not mean that parrallel extension apparatus are required. On the contrary, one extension system can encompass multiple strategies, which may overlap within one geographical area.

This chapter will first examine the overall problem of providing effective extension and sustainable services to resource-poor farmers. Second, the two cases of women farmers and pastoralists will be discussed. Each case will be analyzed in terms of (1) the importance of the problem; and (2) the recommendations for improvement.

II. Reaching Resource-Poor Farmers

In the literature on extension in Africa many authors concur that extension has in general failed to reach resource-poor farmers (Mullen 1989, von Blackenburg 1982, Roling 1982). Unfortunately, there are few proposed strategies for overcoming this weakness. This section describes the key characteristics of resource-poor farmers and presents some ideas for reaching them with agricultural information.

A. Key Characteristics

In order to carefully analyze the problem of effectively servicing this clientele group it is necessary to define what is meant by resource-poor farmers. According to Singh (1988) they are farmers "whose holdings are too small to provide an adequate standard of living at present levels of productivity." "They depend on wage earnings to supplement their incomes from farming" (p.101). One or more of the following key characteristics apply to most farmers in this group:

- Limited land;
- Remote location or inadequate transport;
- Lack of access to a reliable water source; and
- Limited access to credit.

Characteristics limited land and poor access to credit apply to most women farmers, even when they do not apply to the family farm from the male perspective.

1. Limited access to land either in terms of quantity or quality, is a widespread constraint on resource-poor farmers. In Zimbabwe, Chopak (1991) found that 50% of 285 communal farmers he surveyed in the late 1980's have less than 1 hectare of land. Currently, in Kenya aproximately 80% of the farmers have less than 2 hectares. In the case of farmers working with very small pieces of land the divisibility of an innovation or the extent to which "a new cash crop or farm input can be adopted in small units" is the most relevant technology related issue (Uchendu and Anthony, 1975). Many improved technical packages designed for smaller farmers are appropriate for 2 - 10 hectare farms. As Chopak argues, there is no extension "bullet" for very small scale farmers (less than 2 Ha.) that once adopted will increase their income and/or food production to a level of adequate subsistence let alone surplus. Many resource-poor farmers are net food buyers. Finally, there is typically no price policy

reform, nor credit program that can transform their farming and/or livestock enterprise.

2. Remote location causes limited access to extension, transport, supplies and perhaps most importantly markets. In many low-income countries more than half of all villages remain unconnected to any all-weather road (World Bank, 1988b). Supporting staff adequately in remote areas is very difficult. They must have access to transport, be visited by supervisors, paid, have some method of communicating with the main office, attending training etc.

3. Lack of access to a reliable water source for irrigation is common in Africa. From 1985-1987 34 of 43 Sub-Saharan African countries had 5% or less of their cropland under irrigation versus 8 out of 12 Asian countries with greater than 20% under irrigation.[1] Extension strategies for irrigated environments are different than those appropriate for rain-fed areas. In irrigated areas there are more likely to be new varieties to extend and practices to teach regarding the regular use of inputs.

4. Lack of access to credit compounds the problem of lack of access to land. This is a key constraint for all resource-poor farmers which is mentioned repeatedly in both the literature on women and small-scale farmers in general. Resource-poor farmers typically face multiple obstacles to attaining credit. Among these are: collateral requirements; literacy and other skills are needed for understanding and filling out forms; and the relatively high costs of time required for waiting and processing of small loans [2]. A result of lack of access to credit is inability to purchase capital goods, such as animal traction equipment and oxen. The inability to

[1] Numbers in parentheses are % of cropland under irrigation: India (25), Indonesia (34), North (48) and South (58) Korea, Lao (13), Malaysia (8), Burma (11), Nepal (28), Phillipines (18), Thailand (20), Vietnam (28), Pakistan (77) (World Resources Institute, 1990, p.281).

[2] This can lead to somewhat of a catch-22 situation, in that lack of credit means poor access to labor-saving technology, thus tasks require more labor time, the lack of time is then a constraint to obtaining credit. This problem is especially severe for women farmers.

cultivate land quickly can translate into a failure to plant early which reduces yields.[3] Pre-rain planting is not typically an option, especially for hand hoeing, due to hardness of the soil at the end of the dry season.

B. The Challenge for Extension

A critical extension challenge is how to develop effective and sustainable services for resource-poor farmers within the context of broader rural development strategies. Clearly extension alone cannot solve the problems of these clientele groups. However, with other elements of a rural development program such as credit, small enterprise development, infrastructural improvements, and strengthened formal educational services, extension has a very important role to play. A large part of that role should be facilitating participation, and mobilizing local people to organize themselves. Efforts to fullfil this role should be oriented around two issues: (1) developing effective messages for resource-poor farmers; and (2) identifying strategies for increasing the two-way interaction between extension staff and resource-poor farmers.

1. Messages for Resource-Poor Farmers

Extension messages must be appropriate for the target area. This problem is especially critical in the case of resource-poor farmers. Saylor (1974) noted in the early 1970's that the need for adaptation of research results was "well-known but largely ignored". For example, he reports that recommendations developed at the Western Research center at Ukiriguru (in Mwanza, Tanzania) tended to be uniform for the entire Western Cotton Growing Area with diverse physical and climatic conditions.[4] As indicated in the research/extension linkages section of chapter three, this is still a problem in the 1990's. For example, NEP II in Kenya has as one of its main project objectives improving "the relevance of extension information and technologies" (World Bank

3 Shumba in Zimbabwe estimates decreases on the order of 1.2% loss per day (Chopak, Personal Communication) and Edwards et al (1986) in Zambia quote a figure of 3% loss per day.

4 For example, spacing recommendations are the same (23,000 plants per acre) regardless of soil type or rainfall patterns; and early planting is recommended without regard to soil moisture conditions.

field notes, 1990).[5] This problem is especially critical in the case of resource-poor farmers.

Melkote (1988) provides some insights into why inappropriate messages are developed for small-scale farmers. He argues that research stations generally develop packages of innovations based on extension profiles of progressive farmers - the most common point of contact for extension field staff. This element is combined with a "proinnovation bias" on the part of research and extension staff which assumes that all innovations are good and anyone who does not adopt them is a "bad farmer". Small farmers may not adopt innovations because they lack the resources needed to adopt them or because they are not economical at a very small-scale level of production (Collinson, 1968). This is illustrated by the Master Farmer's Clubs in Zimbabwe which require farmer applicants to reach a set yield threshold that can only be attained through the adoption of certain inputs and practices. Consequently, there are far fewer Master Farmers in the low-potential agro-ecological zones than in higher potential areas, not because of lack of interest but because of lack of access to resources (Chopak, personal communication).

2. Two-way Interaction with Resource-Poor Farmers

Orivel's (1983) review of extension evaluation studies reveals that the initial beneficiaries of agricultural extension projects are "amongst those farmers who are least deprived" (p.19).[6] The lack of services to lower income farmers may be due to contact farmer selection bias toward larger wealthier farmers. Remote location also exacerbates the problem of poor extension coverage for many resource-poor. On the extension side, this problem is compounded by poor mobility due to lack of access to transport.

In order to develop two-way interaction with resource-poor farmers, field staff have to be able to meet

[5] Taken from SAR on Kenya NEP II.

[6] This point of view also supported by Stavis (1979).

with them directly. The best mode of interaction in this case is likely to be work with groups. In cases where there are few messages to extend it may be more practical to carry out saturation media "campaigns" on a given issue and temporarily place field staff in the area to follow-up versus placing a large permanent staff in the field with little to teach. An obstacle to extending interaction with resource-poor farmers is financing. Extension budgets are already stretched to cover commitments to recurrent costs made under existing extension projects. Institutional creativity is needed to develop both sustainable sources of financing for improving services to marginal farmers and relatively inexpensive methods of reaching these groups.[7] Some recommendations are made below and further discussion is presented in chapter 5.

III. Extension and Women Farmers

A. Overview

The recognition of the important role of women in economic development which began in the 1970's with Ester Boserup's ground-breaking work has evolved into a highly complex area of study. A key element in the literature on women in development is the effect of technological change on women -- especially in the context of women's access to resources. This section focuses on the question of technological change and its affect on women with special emphasis on the role of extension. Women, as mentioned above, are often resource-poor farmers with little access to land, credit, extension services or labor. However, women have also exhibited a powerful drive to innovate in Africa. In Zimbabwe the proliferation of predominantly female rural savings clubs has contributed to the widespread adoption of hybrid maize (Gura, 1986). In Zambia, inclusion of women in agricultural projects led to relatively higher adoption rates (Eklund, 1988). Additionally, women have a wealth of indigenous knowledge on traditional food crops.

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[7] This clientele group generally have low incomes and a small amount of saleable product. Even if investments in extension for them lead to increased yields, there may be a relatively small multiplier effect on local and/or national income from gains in productivity - especially if most production is consumed at home.

Women represent a large share of food producers and agricultural wage labor. Figures on the proportion of women's labor in farming in joint-headed households varies greatly between countries, within regions and between crops (von Braun and Webb, 1989).[8] Female farming systems tend to be characterized by "female crops" such as cassava, tubers, roots, and vegetables. But, as pointed out by Buvinic and Mehra (1990), the division of farm tasks break down easily in response to changes in demand. "The demand for female farm work varies with land tenure patterns, the commodity being produced, and the degree of integration of agriculture into the market economy. Women's participation in agriculture is greater, as is their contribution to farm income, in small farms oriented to local rather than export markets" (Buvinic and Mehra, 1990, p.292). Additionally, male labor migration leads to increased demands on women's agricultural labor time. Unfortunately, women tend to have less access to labor - especially female-headed households.[9] Technological change has highly variable affect on women's labor, control over income, and family nutrition. Therefore projects to promote small-holder productivity should focus on the dynamics within the family as well as the individual farmer.

B. Women's Lack of Access to Extension Services

In a 1970 study of farmers and extension agents in Vihiga Division, Kakamega District, Kenya, extension staff indicated that they chose target farmers based on gender, cash cropping and acreage. It was found that women farmers were largely ignored, even those with relatively larger farms (Leonard, Chalihu and Tumwa, 1970, p.8). The major findings of a recent World Bank country study on women in agriculture in Kenya (World Bank, 1989) shed some light on the extension relationship with women.

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[8] For example, figures between countries range from less than 1% in strictly Muslim Hausa areas of Nigeria to 49% in Burkina Faso, and 46% in Southern Ghana; within regions and between crops 8% for upland cereals and 77% in traditional women's crops (such as swamp rice) in the Gambia (Braun and Webb, 1989, p.519).

[9] Female headed households in a Tanzanian study were found to be poorer and to have less access to labor (fewer members of the family to assist with labor) (Due et al., 1987).

- The primary constraints to women as agricultural producers are inadequate access to information and resources.
- The official number of female contact farmers remains relatively low (20 - 40%), but wives of absent male CFs are also visited on a regular basis.
- Older agents are less likely to work with women.
- On the whole, male agents work well with women and some agents view women as more receptive to extension advice than men.
- Working with women's groups is more efficient for both field staff and women and helps to reach women in Muslim areas.[10]

Malawi provides an illustration of the extreme importance of directing extension towards women. Men often leave their farms to go and earn extra money on neighboring estates. A UNICEF study released in 1988 notes that 70% of full-time farmers in Malawi are women. Yet, "Female-headed households are often bypassed by credit and extension services" ("African Farmer", no. 4, 1990, p.50). Roling (1982) asserts that it is not good enough to think about reaching female heads of household. Reaching females in "normal" households must also be considered.

Another example can be taken from Cote d'Ivoire where efforts to increase foodcrop production in cotton growing areas have been relatively unsuccessful (World Bank, 1988). One reason for this is the lack of technical assistance directed toward women. Women are not allowed to have individual fields for cotton even though 71% of 200 women surveyed do have sizable individual fields for food crops. There are several gender related reasons for the failure of food crop production to increase: (1) cotton fields worked by women are

[10] If farmers groups are divided along gender lines, reaching both sexes can be a problem. In Machakos, Kenya (Kagundo Division), it was noted that most of the farmers groups in the Division consist of women and thus male coffee farmers are not reached. To reach male coffee farmers, it has been suggested to meet them at the coffee factory where they go every day at harvest time. (World Bank, field notes, NEP I) Additionally, this would be a good opportunity to discuss with the men the advantages of forming groups for more effective extension contacts at other times of the year.

declared in their husbands name; (2) as cotton production increases, the demand for women's labor on that crop increases, leading to reduced time for food crop production; (3) women do not have direct access to extension services (World Bank, 1988, p.96).

The Ghana census quoted in Spurling (1989) from Clark (1985) indicates that "women farmers owned over half the staple food and vegetable farms but only one-third to one-quarter of cash crop farms" (p.1). Women also tended to have smaller plots. Key constraints on Ghanaian women farmers are: (1) lack of information; (2) lack of time due to obligations for child care, food preparation, wood and water gathering and work on men's plots; and (3) the need for some method of expanding acreage (tractor etc.) and transporting inputs. Prior to 1987, and the forming of the womens' arm of the extension service, women farmers and field staff were given little support.[11]

C. Labor Allocation Along Gender Lines

Labor allocation along gender lines is a key concern in terms of putting together good extension messages. The traditional differentiation between men's and women's fields, the usual concentration of women's efforts on food production, and the critical role that most African women play in all aspects of farm management[12], make it essential to adapt extension advice to fit their specific concerns and to communicate directly with them (Feldstein and Poats, 1989). Further evidence for the need to adjust recommendations along gender lines, is given by a study done in West African family compounds by von Braun and Webb (1989). They found that the allocation of labor and other resources affect the distribution of the benefits of technological change

[11] The women's extension service is discussed below.

[12] Selecting the crops to grow and on which fields, what varieties to plant, at what time and with what depth and spacing, when to weed etc.

Work to improve traditional women's crops may not result in benefits to women. For example, the introduction of new technology for rice production in the Gambia has led to a shift from rice being grown individually by women to a communal crop grown under the control of the male. [13] "Similar increased farm labor and substitution effects have been found with the introduction of other crops, such as high-value vegetables and commercialized dairy production" (Buvinic and Mehra, 1990, p.299). Mechanization has also displaced women. New innovations which shift women's labor out of food to cash crop production may have an adverse effect on family nutrition.[14]

D. Recommendations for Reaching Women Farmers

The issue of gender should be brought into the mainstream of extension and research (program planning and implementation). There are many ways to improve extension for women. Several of the obstacles to improving extension for poor-resource farmers as a whole apply to women: returns to working with women may be perceived as low by extension staff; and empowering women may be seen as politically and socially threatening. Additionally, because of the uncertain affects of technological change on labor allocation by gender, it is difficult to design new innovations for women that are sure to have no negative side effects (eg. unlike rice technology in the Gambia).

There are a number of authors who suggest that there should be a special women's extension agency. In Ghana, a women's farm extension division (WFED) was formed out of the earlier home economics unit; WFED is separate from the general agricultural extension services division (AESD). The goal of the WFED is not to duplicate services of the AESD but to address unmet information needs of women farmers such as: (i)

[13] As the yields per unit of land increased from 1.3 to 5.9 tons, the share of women's rice fields in the total droped from 91% to 10% (vonBraun and Webb, 1989, p.523).

[14] In the Gambian case this did not happen, as rice became a communal crop and a higher proportion was retained for home consumption (von Braun and Webb, 1989).

advice on food crops and livestock, nutrition and food utilization; (ii) food processing and storage to alleviate seasonal hunger; (iii) rural home improvement and health and family planning. The Department of Extension Services in Ghana, however, intends to have the two services merge over time (Spurling, 1989).

Berger (1987) discusses the alternatives of providing women with a separate extension service or strengthening the gender focus of existing services. She argues that, if essentially the same information is required by both groups, it is more efficient to have one service. She goes on to explain that even when the organizational structure incorporates female farmer needs, the mode of interaction (eg. use of motorcycles for making visits etc.) in the field and requirements to enter extension as a profession may limit women's participation (p.37).

Reorientation of male agents is another way to address women's needs as farmers without insisting on all female agents (Gura, 1986). As noted above, the Kenya study (World Bank, 1989b) also found that on the whole, male agents work well with women and some agents view women as more receptive to extension advice than men. Additionally, steps can be taken to increase the recruitment of female agents. This is being done in some countries by having high school counselors encourage young women to study agriculture and livestock. Awareness raising exercises on the conditions under which women work should be included in training to give all extension workers an idea of what it is like to "carry water, gather wood, cook meals, nurse babies while also planting, harvesting, and processing crops " (Flora, 1982). As indicated by several authors cited in Eicher and Baker (1982) women work more hours per year than men when non-farm tasks are counted. To improve effectiveness of extension visits to women's groups, the experience in different areas should be compared and lessons shared. For example, in Kirinyaga, Kenya in 1987 there were 51 out of 67 agricultural womens groups covered by extension routes versus 39 out of 67 in 1986. How this improvement was attained should be studied

with focus on how to replicate such efforts (World, Bank field notes, NEP I).[15]

Buvinic and Mehra suggest that agricultural extension should help women to increase food production while shifting more of their labor to export commodities. This implies that they have to increase the efficiency of their labor. As noted above, a key constraint to women's labor productivity is lack of access to labor-saving implements combined with the relatively high demand on their time from other household activities. The overwhelming recommendation in the literature for women is to improve their access to credit so they can afford labor-saving technology and/or hired labor (Due et al. 1987, Braun and Webb 1989, Buvinic and Mehra 1990, Flora 1982).

Extension must help women build their already considerable skills in group organization so they may make their needs heard and be empowered to work toward their own solutions (eg. through savings clubs etc.) This illustrates the point that extension for resource-poor farmers must be part of an overall rural development strategy. It also illustrates that one of extension's key roles with this clientele group is to facilitate local solutions for problems.

IV. Extension for Pastoralists and Agro-Pastoralists

A. Overview

Livestock extension is the process of disseminating new technologies and knowledge of improved husbandry and management practices to livestock producers. One sub-set of these activities is extension for pastoralists and agro-pastoralists. This group of clientele are resource-poor, especially in terms of water access. They generally live in remote locations (and may be nomadic) and thus lack access to information, marketing,

[15] For example, during a July 1986 visit to Kiambu, Kenya, it was noted that 98 out of 280 women's groups were included in the field extension visiting routes. Can any of the lessons of Kiambu be applied to Kirinyaga?

input etc. This section focuses on Kenya but it is possible to apply the ideas presented to livestock extension in other African countries.

1. Who Should Deliver Livestock Extension Messages ?

A difficult issue for livestock extension in general is who will deliver messages and other services to animal producers - field staff from the Ministry of Agriculture (MOA) or Ministry of Livestock Development (MOLD) or agents from the private sector or a mix? There are several factors involved. Firstly, if staff from more than one organization are involved, coordination is hard to achieve, especially at the field level. Second, it may be difficult to have crop staff deliver livestock messages and visa versa because they have different priorities, although they may all acknowledge the importance of increased crop and livestock production. Third, in the case of Africa, the public sector lacks finance which makes it difficult to have separate staff for livestock and crops in all areas. [16] Resolution of these issues must be sought through compromise.

2. Three Perceptions of the Livestock Extension Field Agent

Following are three perceptions of the livestock extension field agent and the arguments supporting each one.

- An agricultural assistant who also advises on livestock, because animal production is an integral part of the farming system.
- An animal health assistant with primary training in veterinary medicine, the argument here is that in practice agriculturalists pay more attention to crops and therefore livestock would get short shrift from an agricultural assistant.[17]

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[16] A major constraint to MOLD's ability to improve services is its inability to absorb all the students being trained as veterinarians and AHAs. Approximately 310 are trained every year and 60 veterinarians (De Haan, 1990 PC). The benefits of hiring additional paraprofessional (junior) staff is offset by the increased costs of transport and professional supervision which are crucial to obtaining useful performance out of them.

[17] Additionally, veterinarians argue that animal health and management are integrated and mutually strengthening and thus should be dealt with together.

- An animal husbandry assistant with a distinct specialist identity, because animal health assistants are overburdened by disease control and curative work and spend too little time on nutrition, hygiene and management.

Both the supporters of agricultural and animal health assistant approach argue against the idea of an animal husbandry assistant by saying that lack of transport and general staff support make it more effective to have one person deliver messages on several subjects (Leonard, 1987, p.231). Barring expensive increases in numbers of staff and vehicles, it is unreasonable to expect the staff of the Ministry of Livestock Development (MOLD) in Kenya to provide both adequate clinical services and extension services.[18] It is essential that whatever type of livestock extension system is devised, it should be thoroughly coordinated with animal health services. Close linkages between NEP II and the implementation of the Animal Health Services Project (AHSP) in Kenya, are therefore required.

Animal Health Assistants (AHAs) follow a regular schedule and they can conveniently carry out many activities including those related to extension, at the dip site. They are responsible for supervising the dip attendants who are local people with primary education. "Dip committees" are locally elected. In Kenya (as of 1986) there were 1,869 persons attending to government dips and 3,440 dips in operation (World Bank field notes). Therefore, dip attendants with adequate additional training are good candidates to help extension field staff.

Leonard (1987) suggests that a cost effective approach might be to have animal husbandry handled by

[18] Sanford (1983) points out that because veterinary services are in such short supply, it is difficult for veterinarians to find time to engage in anything other than urgent activities to control livestock diseases... (pp.195 - 196).

generalist agricultural assistants, [19] taking the whole farm approach (p.233). However, he notes that different solutions are needed in different areas and that there is a need both for generalists and specialists. This observation illustrates the importance of extension pluralism. As Walshe, (1990, PC) notes, it is better to build an organization around the functions of people than visa versa. This comment is reinforced by Leonard's remarks that it is important to be able to compromise based on both: (i) bureaucratic politics; and (ii) a realistic assessment of what different professional groups have the time to attend to (p.233). Therefore, clear job descriptions for all types of livestock production areas are needed as well as detailed information on available staff numbers, skills and distribution in order to design a more efficient strategy for training, placement and staff management.

B. Livestock extension in the Arid and Semi-Arid Lands (ASAL)

In the ASAL, there is much variability in climate and livestock production systems. The three main production systems are: ranching, nomadic/pastoral, and agropastoral. Each group needs a different type of livestock support service. The primary constraints to provision of extension services to ASAL areas are lack of technology, remoteness of the clientele, somewhat negative perceptions of government interventions on the part of pastoralists, and incorrect assumptions about pastoralists on the part of government officials and outsiders. It is necessary that outsiders understand that the social bonds, norms and structures which organize herders living at low population densities and often on the move in arid or semi-arid areas, will necessarily be different from those prevailing in settled agricultural (let alone industrial) societies (Raikes, 1981, p.27). According to Raikes, the general government attitude towards pastoralists has been one of how to get them to give up their way of life and to be more controllable. The pastoralists of course consider this to be a threat. Destocking and grazing control policies of the government are therefore viewed with much suspicion.

[19] There would then be a need for retraining of both MOA and MOLD staff to facilitate their abilities to advise on both crops and livestock. Some agricultural agents may need hands-on training to be effective in working with animals (De Haan, 1990, PC).

In order to design appropriate services for the ASAL areas, it is essential to understand the complexity of the environment and the people who live there and to comprehend how they interact. As with other resource-poor areas, there is no extension or policy "bullet" that will solve the problems of the ASAL. Moris (1981) in a report on his work with the Maasai, argues that, "the pastoral dilemma is fundametnally a systems problem. No single measure is likely to change things greatly because of the negative influsence of other weaknesses in the total rural system" (p.112).

A study designed by ISNAR for Somalia comprising four separate detailed surveys is a good example of the kind of data collection procedure required to understand rangeland areas well enough to design appropriate interventions for them. A study along these lines might be helpful to the Kenyan, and other situations if properly adapted and applied. Following is a brief description of the approach to extension services which might be most appropriate for pastoralists.

1. Pastoralists

de Haan, Walshe and Sihm (1990, PC) are all of the view that the key issue in the pastoral areas is animal health. They stress the need to provide veterinary services and an adequate supply of drugs but indicate that there are really no technologies to offer through a conventional extension system. The 'traditional' herdsman without access to modern drugs, may have to exercise more skill to ensure the health or even the survival of his (or her) animals, than does the modern farmer who can rely on drugs and on veterinary doctors to prescribe and apply them (Raikes, 1981, p.40).

According to Sanford, (1983), what is needed in pastoral areas are multi-purpose extension agents who can act as conduits between herders and government on issues of range management, veterinary services, water needs, and marketing. Because of the high ratio between travelling time and contact time, Sanford suggests that

the most efficient use of field staff is to make each 'occasion of contact' an opportunity to exchange information of more than one kind (p.147). He describes three types of social groupings that can be used for communication links: (i) camping communities (people who migrate and camp in the same area); (ii) watering communities (groups that use the same water points or well clusters); and (iii) traditional political and social structures (age groups, kinship groups etc.).[20] Many countries have experienced success using pastoral organizations as a channel for animal health services; examples are the Central African Republic, Guinea, Niger, Somalia, Senegal.[21]

There is a consensus in the literature that radio can be extremely helpful in reaching pastoralists.[22] Mass communication used to reach pastoralists should be backed up by veterinary services. In Kenya, some use has been made of mobile audio-visual units. The units attracted a lot of attention but tended to break down frequently. There have also been efforts to develop residential training courses for pastoralists. However, they often foster a sense of unreality (Sanford, 1983,p. 146). Local training centers in Northern Kenya have had trouble drawing pastoralists because they tend to give the impression of "lecturing down" to those attending the course. Herder service centers are an alternative. They could include a veterinary clinic and pharmacy backed up with training facilities on the same site. Such centers could be located near dip sites to facilitate their use.

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[20] These types of contact are being suggested for pilot activities under NEP II in the form of travelling teams. Care should be taken to ensure that these teams meet the criteria that field staff in pastoral areas must have knowledge of local language and traditional culture. One effective method is to identify pastoral organizations (based on traditional groupings) and train a member thereof to work as a field level advisor. (De Haan, 1990 PC)

[21] Walshe (1990, PC) suggests a system comprising a limited number of field staff with SMS level skills to carry out demonstrations and pilots. Coates (1990, PC) supports the notion of having field staff in pastoral areas trained to solve problems on the ground as opposed to purely transmitting messages. To this end, a system could be devised whereby local people sent for relatively short training could periodically liaise with SMS level staff and research scientists at the meeting points suggested by Sanford (1983).

[22] In Botswana, a radio campaign was used successfully with 3,000 radio listening groups to explain a new land tenure policy; however, some isolated groups were not reached.

2. Agropastoralists

As Kenya's population grows, increasing numbers of people move into the ASAL areas to cultivate crops on marginal lands. Moris (1981) asserts that all over Africa there is a "tidal invasion of pastoral lands by marginal crop cultivators being pushed outward by population pressure" (p.112). As the area for grazing becomes smaller, some previously nomadic pastoralists begin to cultivate crops. "The cultivation is fiercely risky (with total crop failures perhaps one year in three) but the returns per hectare to individuals exceed those of pastorlism" (p.112). Clearly this group urgently needs a combination of services, including extension advice and support, to help them both in livestock and crop production, as well as conservation of the fragile environment they depend on for survival. Because the households in this group are relatively far apart but generally not nomadic or seasonally nomadic, the appropriate mode of interaction may be meeting with groups. Because of the emphasis on livestock, it may be useful to establish meeting places near dips or other locations for clinical services.

Jahnke (1982) argues that human rather than livestock development may be more important in the pastoral areas. He feels that it is necessary to teach pastoralists how to adapt to life in other sectors of the economy so that the "arid zone can be used within its capacities and continue to be a valuable resource." In this regard, extension can work with sociologists to develop educational materials and methods for use with pastoralists on finding markets for their products, and creating services and developing alternative enterprises.

IV. Recommendations for Reaching Resource-poor Farmers

When access to land and reliable water sources are limited there are several possible strategies - all of which require substantial work on the part of agricultural research. One option is to develop methods of soil and water conservation and small scale irrigation technology. Where appropriate high value crops may be

introduced for cash (export crops like coffee) or for local barter (eg. tomatoes).[23] Cooperatives may be formed to reduce small farmer risk related to introducing new non-food commodities (which may not be very 'reversible'[24]), and improve access to inputs and markets. Extension efforts should include help for farmers to develop non-farm rural enterprises to supplement their incomes - especially in the area of processing of agricultural products. Extension's role in implementing such ideas is to work with farmers to develop appropriate strategies for solving current problems, funnel the information to researchers, work with them to adapt technologies to fit specific areas, design a dissemination strategy, and finally monitor the results.

Another important role of extension is to package information to make it useful to the target audience. For example, a study in Northern Zambia indicates that farmers had their own concepts for measuring area, and distance (Francis and Rawlins-Branan, 1987). They did not use the concepts of hectare or acre - yet all the recommendations being extended were designed in terms of those units. Extension should either adapt the recommendations to fit farmers measurements or teach farmers how to use common unit measures.

As noted throughout this paper maintaining adequate direct contact with farmers is difficult. To reduce the demand for direct contact with farmers, Robert Chambers (1974) at one time suggested targeting farmers who are at an "adoption or capital threshold" and phasing out services to those who pass the threshold. An alternative to phasing out services is to involve farmers in teaching other farmers after reaching a certain level of expertise.[25] They might help organize follow-up activities after courses at an FTC, moderate radio listening

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[23] There are many success stories with small scale cash crop production: tea in Kenya (170,000 farmers), cotton in Zimbabwe (45,000 families), rubber in Malayasia.

[24] 'Reversibility' referring to the ease with which land under a new crop can be returned to its previous use. Tea, for example, has poor reversibility due to the long time to maturity.

[25] This is not unlike the Master Farmer Scheme philosophy developed by Emery Alvord in Zimbabwe in the 1920's.

groups, assist in carrying out adaptive research trials on their own farms, help the extension agent in surveying the input needs of his/her neighborhood etc. By motivating and enabling clientele to get more involved, extension staff would help build the human capacity needed to make a demand driven extension system work (this concept will be further discussed in chapter five). Clientele should have opportunities to participate in decision-making pertaining to resource allocation in their community. As noted in chapter three, field staff need training on how to facilitate participation before they can take on mobilizing and enabling tasks. Additionally, empowering people who lack resources may lead to demands for re-allocation of resources which is politically threatening.

V. Summary

This chapter presents a discussion of the problem of providing extension to resource-poor groups by honing in on two typically resource-poor groups: women and pastoralists. The two groups are discussed in terms of their importance, recommendatons for overcoming constraints. Improving the economic circumstances of the resource-poor farmers in Africa is vitally important but extremely complex. The key constraints to these farmers are: (1) limited access to land (quantity and quality); (2) remote location causing limited access to extension, transport, or supplies; (3) lack of access to a reliable water source; and (4) limited access to credit and thus capital goods. A critical extension challenge is how to develop effective and sustainable services for farmers working under these conditions. Essentially, to serve these farmers it is necessary to to design comprehensive rural development programs rather than promote single interventions such as extension, credit, or irrigation. Extension's role in a rural development program should be largely one of facilitating participation, and mobilizing local people to organize themselves. In this regard two key areas of extension focus are: (1) the development of appropriate messages for resource-poor farmers; and (2) identifying strategies for increasing two-way interaction between extension staff and resource-poor farmers.

The two cases of women and pastorlists are presented as examples of resource-poor farmers. The important contribution of women farmers to African agriculture is unquestionable. Yet extension has, for the most part, failed to serve their needs. A key task for extension in working with women is to coordinate with research to consider the affects of changes in technology on women's access to resources: time, income, nutritious food for the family, etc. Recommendations for reaching women farmers include: (1) the issue of gender should be brought into the mainstream of extension and research (program planning and implementation); (2) reorientation of male agents is a way to address women's needs as farmers without insisting on all female agents; (3) steps can be taken to increase the recruitment of female agents; (4) include awareness raising exercises on the conditions under which women work in training for all extension workers; (5) to improve effectiveness of extension visits to women's groups, the experience in different areas should be compared and lessons shared; (6) is improve women's access to credit so they can afford labor-saving technology and/or hired labor; and (7) empower women by helping them further develop their skills in group organization.

Pastorlists are given as a second example of a poor-resource clientele group. The primary constraints to provision of extension services to pastorlaists are lack of technology, remoteness of clientele, somewhat negative perceptions of government interventions on the part of pastoralists, and incorrect assumptions about pastoralists on the part of government officials and outsiders. As with other resource-poor areas, there is no extension or policy "bullet" that will solve the problems of the ASAL. The key recommendations are to: (1) provide veterinary services and an adequate supply of drugs; (2) use multi-purpose extension agents who meet with pastoralists at common gathering points, act as conduits between herders and government on issues of range management, veterinary services, water needs, and marketing; (3) use radio to extend information over wide areas. In the case of agro-pastoralists, the key is to provide a combination of services that help this group both in livestock and crop production, and also conservation of the fragile environment they are dependent on for survival.

In chapter five a the idea of demand-driven, pluralist extension is presented as a positive direction for African extension systems to take. Included is a discussion of how a pluralist focus in designing extension systems would help to meet the needs of the groups discussed in this chapter.

CHAPTER FIVE - EXTENSION PLURALISM

I. Pluralism as a Conceptual Framework

A. Overview

Pluralism provides a broad conceptual framework for designing specific extension strategies to improve the effectiveness and sustainability of extension in Africa in the 1990s. The key elements of extension pluralism are as follows.

- Different strategies to meet the needs of different areas and clientele groups within one country.
- Priority setting which is demand-driven to ensure that program planning is responsive to actual clientele needs.
- Decentralized organization which stimulates local participation, financing, and accountability.

Within this framework the organization (internal management and external linkages), modes of interaction, content of interaction, and target are all adjusted to meet an array of objectives. Contingency theory, a section of systems theory, supports the notion of extension pluralism. "The fundamental proposition of contingency theory, ... is that there exists no single best way to organize; rather, an effective organization generates structures, strategies, and procedures that fit the requirements of the tasks to be accomplished and of the particular environment in which the organization operates" (Brinkerhoff, 1980, p.12).

An important reason for pursuing the implementation of this conceptual framework is increasing rural stratification in Africa. As Eicher (1990) points out, agricultural development strategies must go beyond the development of a standard technological package to meet the needs of the four main groups of farmers in Africa in the 1990s. The four groups are:

(1) resource-poor farmers - net food buyers generally supplement income with wage labor on larger farms and non-farm activities;

(2) small-holders and herders - main source of labor is the family, produce food, livestock and export crops for sale domestically and internationally;

(3) middle or 'progressive' farmers - use oxen and/or hired labor; more able to bear risks; provide some employment to resource-poor farmers; generate a markteable surplus;

(4) large-scale farmers - a "new class...emerging from the ranks of soldiers, merchants, present and former civil servants, and the new professional class." This group is politically powerful and able to extract resources and services from governments (Eicher, 1990, p.505).

The idea of having different extension strategies to fit different clientele groups is not a new one. At a 1962 FAO/CCTA conference on extension work in East, Central and Southern Africa the participants concluded that increased participation of clientele in planning their own extension programs was warranted but that there was "no particular organizational structure which would suit all countries" (FAO report quoted in DeWilde, 1967, p.182). An important reason for developing flexible and pluralistic extension systems in Africa is to meet the changing needs of clientele groups. Ideally, extension services should adapt to the changing needs of clientele.[1] Infrastructural development, especially related to transportation and/or communication, will change the options for interacting with clientele and supervision of field staff. Additionally, urban migration changes the composition of clientele groups and increases the role of extension in urban areas. As economic opportunities change women will be able to exert more influence and increase their access to resources which will change the nature of services they require from extension.[2] Building institutional flexibilty into the extension system will diminish both direct costs and transaction costs of adjusting the various elements of the system over time. Conversely, rigid top-down nationwide systems with large numbers of poorly trained, poorly supported agents in the field have relatively high dismantlement and/or adjustment costs. Pluralism within a unified extension system will not emerge under the control of top-down hierarchical structures which suppress

[1] In Zimbabwe, CONEX officers working with European agriculture became highly specialized over time (Keenan, 1980). This is currently a need for relatively sophisticated African farmers (both large and small).

[2] For example, decreased economic reliance on men is a major force behind women's willingness to vocalize their demands.

responsiveness. To achieve pluralism, institutional creativity is needed to make extension systems in Africa more demand driven, de-centralized and strongly linked to research, formal educational institutions, and agribusiness.

B. Alternative Extension Strategies

Within a pluralist system, there are many possible alternative extension strategies which can be used to address different needs within a country. These strategies may be carried out be a variety of organizational structures. Moris (1991) summarizes the primary organizational structures involved in extension and describes the strategies they have typically employed. To review from chapter two, he lists them as: government ministries, export-crop parastatals, commercial firms, marketing cooperatives, farmers and village associations, individual projects, and training institutions. However, these primary organizational structures can each take on a range of different strategies. For example, Moris describes the farmers association extension strategy as coercive within the context of the forced villagization period in Tanzania during the 1970's. On the other hand farmers' associations can start out controlled by government and end up autonomously run by farmers as in the case of Taiwan.

An example of multiple strategies in one country is given by Cote D'Ivoire. The objective for agricultural development in the North is to alleviate some of the problems of "regional imbalance and low incomes: the rural exodus, inter-regional migration which causes land disputes, the general political dissatisfaction in the poorer regions which threatens the unity of the country" (Elliot, 1974, p.1). The extension strategy in the North was to introduce cotton as a cash crop to keep people in the area. The extension needs of the South with its rich and productive agriculture are quite different. The southern farming system includes many tree crops and requires a strategy which is capable of delivering fairly complex technical information.

Strategies requiring intensive field staff coverage such as T&V and commodity-based methods, involve

high costs and may be more appropriate in situations of relatively complex technology. A study of T&V in India by Feder et al. (1986) showed that "...irrespective of farm size the data show that all classes of farmers prefer to recieve advice about the more 'expensive' practices from the VEW" (p.26). Also, "... the importance of the VEW rises as the riskiness or complexity of agricultural practices increases" (p.27). Generally there is proven technology available only for certain areas of a country where intensive thrusts to disseminate the new information are justified.

There are other strategies for resource-poor areas such as general community development focusing on poverty and hunger alleviation which may include many different efforts from non-farm employment training to nutrition and health programs. Top-down crop-focused strategies, reflecting the colonial legacy, are of little-value in addressing the needs of resource-poor or small-scale farmers and herders. Even in high potential areas, there is often demand for attention to information needs beyond those relating to agricultural technology per se. For example in the context of extension for irrigated areas in the Sudan, monthly or "village" days are being organized to attend to such needs (Kumar, personal communication).

An appropriate strategy should not be soley chosen on the basis of the theoretically "best" way to serve a specific clientele group. From the discussion of financing in chapter three it is clear that extension planners should start from availability of resources and work towards a strategy which is sustainable rather than "ideal". For example, as Moris (1991) points out, many extension advisors insist that extension staff duties be limited to "pure extension work" even though this is unrealistic. Moris goes on to argue that it is often the case that extension has to deliver inputs, or do favors for external agencies such as an irrigation ministry in order to get any support for or response to their extension work (p.64).

The application of ex-ante cost/benefit analysis and social cost/benefit analysis may be helpful to

determine how feasible various strategies will be. Another option is to use a sort of scenario analysis (Glenn Johnson, personal communication). This amounts to simply mapping out some alternative strategies and (with or without computers) assessing the pros and cons of each. The exercise should help to identify the great range of different services that are needed and identify options for providing them - including privatization and cost-sharing

In choosing a strategy, trade-offs will have to be made between different objectives. The trade-offs involved in meeting various goals are well exhibited in the US$26.7 million Agricultural and Farm Management Training Project (AFMET) in Somalia. The goal of AFMET was to establish a semi-autonomous organization which would strive to meet the national policy objectives of: (1) increasing food production to the highest level of self-sufficiency feasible; and (2) to increase farm income while keeping consumer food prices stable. The service is concentrated in three regions inhabited by 51.3% of the total 170,000 families reached by extension. The primary form of agriculture in the area covered is controlled irrigation. Mullen criticizes the project for "having a disproportionately adverse impact on traditional farmers, who form the majority of small farmers" (Mullen, 1989, p.153). Primarily because the increased use of imported fertilizers under AFMET has led to higher fertilizer prices. He goes on to argue that, "T&V is heavily biased in favor of high yielding varieties and irrigation, which is the only way to justify its high running costs" (Mullen, 1989, p.164) AFMET with high operating costs had serious sustainability problems. Mullen's recommendations are; (1) careful winding down of the project to minimize staff demoralization and disintegration of the projects accomplishments; (2) develop a "strategy by which the Ministry can guarantee the effective delivery of extension services to small farmers beyond the life of the project; (3) consolidate AFMET work within the Ministry; and (4) adapt or replace the T&V system.

Several questions are not addressed in Mullen's analysis. First, is it reasonable to focus only on helping

smaller farmers who are unlikely to generate food production increases to meet the goals stated for the AFMET project by the GOS? Second, what are the strategies to provide effective services to small farmers? The bottom-line is to help both sectors. Third, if the commodity focused extension system is more successful at recovering costs, how can it help support food crops? Creative ways are needed to manage spillover so that funding for marginal areas can come in from high-potential ones. Perhaps, irrigated farmers in Somalia could pay for more of the services they recieve under AFMET -- if they value them. It is necessary to take an overall view of the agricultural sector within a pluralistic system rather than concentrating on projects.

II. Toward A Demand Driven Extension System

A. Overview

At the outset of this chapter it was argued that specific strategies are devised to meet an array of objectives. Clearly, a critical issue, as noted in chapter three, is how those objectives will be set. This section discusses the option of a demand driven extension system in which the objectives and consequent strategies for accomplishing them are set in accordance with clientele demands. The interesting question is how to attain a mix of top-down and demand-driven elements in a pluralist extension system.

Up to now governments have played the dominant role in providing agricultural information in Africa. As discussed in chapter four, government officials have a vested interest in maintaining a large field staff to serve multiple functions which generate benefits to them (goods such as information and communication opportunities etc.). In order to control this force they will want to control selection, training, and programming of such agents. In commodity focused systems, field staff are controlled by a private or quasi-private agencies. However, the government generally dictates the contract terms and may select local field staff. In the case of "animation rurale" the local people select volunteers to go for training and these trainees come back to teach them. However, the message they transmit is shaped from above. How can greater responsiveness be incoporated into

African extension systems? What rules, legal mechanisms, social attitudes etc. have government-run agricultural information systems imposed that will impede the incorporation of responsiveness? A major factor is attitude, fear of speaking out - especially for women. Others factors are: lack of information or communication infrastucture, poor education and illiteracy, and lack of common languages in rural areas.

Several options for bottom-up control of field staff have been discussed in earlier sections: local selection of agents, cost-sharing, local evaluation of agents performance, participation in training etc. However, decentralization of power means relinquishing control and a potential loss of benefits or quasi-rents. Williamson's (1985) concept of economic actors as opportunistic makes it clear that easy and rapid decentralization is unlikely. Two conditions necessary for the emergence of increasingly demand driven systems are: (1) increasing costs of maintaining control on the part of governments[3] ; and (2) progressively greater perception of the benefits of sharing control on the part of both clientele and extension policy makers. Some of the mechanisms behind satisfying these conditions are discussed in the next section.

B. Sources of Pressure for Institutional Change

Pressure for change in extension systems in Africa comes from different sources: (1) fluctuations in the costs of production and/or the prices of products; (2) activities of political "entrepreneurs"; (3) changes in the institutional choice set which occur as governments become democratized and markets liberalized; (4) changes in non-agricultural technology; and (5) alterations in other institutional arrangements.

Ruttan and Hayami (1990) apply the case of a shift in relative prices to agricultural research. Their paradigm can be adapted to the case of extension. As relative factor prices change, producers have incentives

[3] Moris (1991) asserts that the most serious problem for government run extension in Africa is a lack of financing.

to change their use of resources and therefore to adopt new technologies. The induced innovation model indicates that farmers will pressure extensionists to provide them with the information they need. But Bardhan (1989) argues that the "supply" of institutional innovations is dependent on political entrepreneurs promoting the necessary collective action and not simply by changes in prices, technology or demography as Hayami and Ruttan postulate.

In the context of extension, political entrepreneurs serve to organize local clientele to make their demands heard and/or to solve their own problems. Political entrepreneurs may be motivated to form interest groups and facilitate collective bargaining due to classic opportunism (eg. they will personally profit) or an "irrational" desire to do good. Bardhan asserts that it is hard to know where the impetus for change comes from and presents two examples: (1) did enclosed farming in Britain occur because it was more efficient than open-farming or because it yielded certain benefits to landowners in terms of ease of collective action; and (2) did a lower wage rate and different employee/employer relationship in the Phillipines in the '70s occur because of "disequilibrium between labor productivity and wage" or because "population pressure on land made collective action easier on the part of the employers"? (p.1393). Bardhan and other authors (Bingen and Faye, 1987), focus on how the relative power of different groups affects institutional change - and this must be considered in the case of extension in Africa.

As African governments become democratized and more market-oriented, there will be changes in agricultural policy, including extension policy. Thus, the institutional choice set is altered. Liberalized markets will lead to increased interaction with international agri-business and the stimulation of domestic agri-business. This in turn increases the options for private involvement in extension activities. Within a democracy politicians are responsive to constituents because they have an incentive to be re-elected.

Changes in non-agricultural technology also affect extension's institutional structure. Innovations in (or construction of) communications and/or transportation systems change the relative effectiveness of different types of extension institutions. For example, telephone coverage into rural areas, would increase the options for extension contacts, as would roads and reliable transport services into remote areas.

Alterations in other institutional arrangements change the linkages and overall structure of the extension system. For example, changes in research institutions, and other agricultural service institutions (such as introduction of farmers service centers that offer advice and sell inputs) can strongly affect extension, as would development of farmer training centers, or political bodies such as strong farmers organizations. External financing arrangements are also a part of the institutional framework. For example, if donors discontinued or changed the basis of long-term direct funding of national agricultural extension systems, the options for extension strategies would be changed.

Bromley (1988) argues that, market driven mechanisms (in which I include demand driven extension systems) are costly to establish in LDCs. He cites costly information, haphazard negotiations, and difficult enforcement due to poorly developed legal structures and resources for enforcement. One of the costs of developing more demand driven extension pluralism is uncertainty. A key factor is to move slowly. Large scale institutional overhauls may end up badly. Initial changes required are re-focusing of objectives or mandates and increased understanding of the alternatives possible to reach them (including assessment of costs and benefits in the field).

C. Who Will a Demand-Driven System Serve?

A demand driven system will not necesarily benefit resource-poor groups. Is it realistic to expect demand driven extension systems in Africa to serve the needs of small-scale and resource-poor farmers and

livestock producers? It will do so only if those groups are able to organize themselves to pressure the government or private institutions to provide them with services. They will have to compete with what Roling (1982) calls "strong lobbies of well-organized high access commercial farmers" already influencing ministries of agriculture. A source of support for resource-poor farmers is the NGOs. However, the initial pressure for services to resource-poor groups probably have to come from the top-down in terms of facilitating local mobilization. This is the critically weak link in such efforts. The incentive at the top is typically not to undermine existing power structures. This factor taken together with limited resources in most African countries could lead to demand-driven extension pluralism which ignores the needs of small-scale and resource-poor farmers, especially women.

With the introduction of democracy the variable of noise from constituents, the "decibel meter" (Moe, 1984), becomes increasingly important. Roling (1982) cites his own 1972 study in Kenya which revealed that the most productive areas recieved the best extension staff. His discussions with administrators confirmed that "good sub-locations had demanding farmers, whom the extension service wanted to keep happy, lest they should voice strong objections" (p.103). This is certainly a good indicator that demand driven systems are working in some places. The question is how to strengthen the voices of relatively powerless groups.

III. Making Demand Driven Pluralism Work

This section presents some of the key factors that will be needed to make demand driven pluralism work. Ideas for futher research are discussed in the final chapter.

A. Creativity

Pluralism must be introduced in the face of entrenched bureacracy, and the difficulties of mobilizing grass roots change (especially for relatively powerless clientele). Because of this, institutional creativity and

innovation are essential elements of this evolutionary process. [4] As argued earlier, a condition for power-sharing is a change in the relative benefits and costs as they are percieved by clientele and government. It will require institutional creativity to work towards satisfying that condition. For example, in low-potential areas can rural develoment strategies (including extension) be designed to include local accountability and cost-sharing? Can such a strategy be attractive to both groups and earn the on-going support required to be sustainable?

Creativity is also needed is in terms of the content of extension interactions. Roling (1982) suggests that it may be better to concentrate on generating off-farm part-time employment for target groups with little access to productive resources. In resource-poor areas extension has an educational and facilitative role to play in everything from road building to water projects to nutrition. It is necessary to learn from clientele to understand the options.

B. Time Frame

Change takes a long time. In order to make effective recommendations for improving extension it is important to be realistic about what can and cannot be done. Donors and governments often expect that projects (or new strategies) will yield results in a very short period of time - 5 years or so. For example, community development (CD) touted by its supporters as a way to build democracy had "failed" after roughly 8 years. Is 8 years long enough to build democracy? Not in the best of circumstances and certainly not after nearly a century of colonial rule.

One area which could be slowed down is that of expanding pilot projects, especially in low-potential areas. An alternative is to have many pilots going on and link them together through information exchange

[4] Shaffer (cited by Schmid 1989) asserts that "institutional creativity and innovation are a hallmark of the institutionalist".

(something as a simple as a newsletter). The formation of farmers organizations can be facilitated but should be allowed to proceed at a natural pace. The lesson of the early Cote d'Ivoire national cooperatives is that it is not possible to force people to form participatory institutions.

C. The Nature of Bureaucracy

Another area where realism must be applied is the nature of bureacracy and government. DeWilde (1967), for example, argues that extension should be separated from government because it requires flexibility and imagination and is stifled by bureacracy. In a public institution the rules for hiring, and firing, pay and fringes etc. affect the type of people who choose to work in the civil service (and remain there), these conditions also affect the opportunities and incentives to shirk (Moe, 1984, p.764). As a total separation of extension from government is unlikely, and not be entirely desirable, the question is what can be done to overcome the weaknesses of a lack of flexibility and imagination. The first step, as argued above, is increased local accountability. Second, methods should be sought to get some elements of the public sector system into the private and to make contracting more effective.

Is it realistic to ask a public bureacracy to search for innovative and creative institutional alternatives? And to limit size, and recurrent costs? Only if it seems in their best interest to do so or if there are a majority of "irrational" politicians who are non-opportunistic. The donor community should concentrate its efforts on a push for demand-driven pluralism versus strengthening the old colonial structures.

D. Recognition of the Past Experience of Extension in Africa

New extension initiatives should not "re-create the wheel" by failing to learn from existing or past activities. There is no clean slate for extension in Africa. There are pre-conceived notions on both the parts of farmers and administrators based on experiences beginning in the colonial period. The recommendations in

this paper require the generation of a demand driven pluralistic system by a population which is in many cases accustomed to coercion. Traditional cultural attitudes and habits or those inherited from the colonial period may inhibit some forms of organization. However, as Lin argues, "A nation need not stop developing its economy until the establishment of a set of values or mores that are congruent to growth (p. 28)." The two things have to occur simultaneously. What is needed is some kind of catalyst, facilitation, new incentives and information to mobilize clientele. Inspired field staff, of whom there are many, must be better supported. Two key questions are: (1) how to make local people take on the support of industrious field personnel and; (2) how to break the cycle of usurping resources before they reach the field, poor management, weak feedback mechanisms, and low pay.

E. The Role of the Central Government

As the extension system becomes more demand-driven the role of the sentral government changes but does not disappear completely. If government extension services were to cease tomorrow and the private sector or universities somehow expected to miraculously leap in to fill the gap, this would be unrealistic and damaging to farmers who depend on extension for information and in many African countries for inputs. Rather, governments may focus on developing mechanisms (such as new of reformed legal and regulatory structures) which would lead to local accountability for extension, and decentralize some of the responsibilities for programming and implementation to local governments. At the same time government can shift its focus to issues of broad social concern by working to develop standards for extension personnel selection, put in place systems of monitoring and evaluation, invest in improving educational institutions, and promote new incentive structures which will strengthen linkages between research and extension.

If extension field staff are to become facilitators within a demand-driven system in Africa they will have to have some degree of autonomy from centralized government control. CES in the U.S. provides an example.

CES employees are not direct-line employees of any of the three levels of government (county, state, federal). They are joint employees of the land-grant universities (state level) and two-thirds employed at the county level resulting in a system which is to a large extent funded locally. In a system incorporating local accountability, African field staff will increase their focus on serving their clientele. In order to fullfill this role, staff require education, in-service training, quality supervision and support as discussed in chapter 3.

F. Extension's Changing Role Over Time

What will extension's role in agricultural development be over time? It may become in part a "protective institution". These are institutions that "protect society from the outcome of the self-adjusting market economy" (Shaffer, 1969, p. 249). As the stratification of the farming sector in Africa continues, protective institutions will be needed in various forms. As Shaffer (1969) argues, "It is the protective institutions which determine to what extent the effects of new technology will be internalized. They determine the incidence of the costs of technological displacement (p.250)." During the inevitable transitions that will occur in the agricultural sector in Africa over the next 50 years extension's role should be that of enabling clientele and strengthening linkages. Extension should not purely focus on disseminating technology or even delivering feedback, it should work together with social scientists, researchers and politicians to develop institutional innovations as complements to technology. [5]

V. Implications for the Donors

The major donor organization involved in supporting extension services in Africa is the World Bank. The total number of projects with an extension component that they are currently supporting or planning to start

[5] Shaffer (1969) outlines the role of agricultural economists in this process.

"Agricultural economists come as close as any group to having the background and attitudes needed for effective participation in research and extension activities required for evaluating existing institutions and developing improved institutions".

in Sub-Saharan Africa through 1994 is 55. The number of countries covered is 30: Cameroon, Chad, Congo, Cote d'Ivoire, Benin, Burkina Faso, Burundi, Ethiopia, Gambia, Ghana, Guinea, Kenya, Madagascar, Mali, Malawi, Mauritius, Mozambique, Niger, Nigeria, Sudan, Somalia, Rwanda, Senegal, Tanzania, Togo, Uganda, Zaire, Zambia, and Zimbabwe. The primary strategy they have applied in their extension projects is T&V. From the perspective of development professionals outside the Bank, the key issue regarding extension in Africa today is T&V. Based on the evidence brought together in this study and elsewhere, the World Bank should incorporate pluralism into their African extension program and seek mechanisms for methods of making African extension systems more demand-driven. Based on discussion of World Bank field staff at a workshop on the Bank's Agricultural Services Initiative held in Malawi, the transition is already underway.[6] The field staff from the regional missions in most of the above countries participated in the workshop to discuss their experiences with extension projects and to consider strategies for the future. The main conclusions of the Lilongwe workshop were as follows.

- Extension interventions must be part of an overall agricultural development stategy which addresses credit, marketing, technology generation and other factors in order to be successful.
- Farmers participation in planning, implementing and evaluating extension projects must be increased.
- The diagnostic skills of extension personnel (field staff and managers), researchers, and subject matter specialists must be improved through improved training.
- Technology generation and dissemination are part of one system and not separate activities.
- Resource-poor farmers are being neglected by current extension services and special extension strategies are required to meet their needs.

The advent of agricultural services projects and combined extension and research projects reflects the changing attitude in the World Bank towards extension. However, the World Bank has not yet released a formal

[6] See the forthcoming proceedings of the February, 1991 workshop on the World Bank's African Agricultural Services Initiative held in Lilongwe, Malawi.

evaluation of the application of the T&V strategy in Africa during the 1980's. T&V introduced high recurrent costs and was not sustainable in terms of finances, post-project political commitment, or human resource capacity. T&V projects led to bloating of field staff numbers and bureacracy. In Kenya under NEP I, considered the most successful application of T&V in Africa, the staff numbers were increased by 6 times more than originally agreed under the project and each of the three times the project was extended the incremental salaries component was raised.[7]

T&V has spread all over Africa due to the efforts of the World Bank with the cooperation of African governments. The positive side of this phenonenon is the emphasis placed on the basic principles of scheduled work-plans, regular training, feedback from the field to research, and clear job descriptions for field staff limiting extraneous responsibilites, all of which are widely accepted as sound (Moris,1991). However, changes are coming in the form of more work with farmers groups (a move away from the contact farmer approach), increased efforts to involve extension and farmers in adaptive research along the lines of FSR, calls for training in diagnostic skills, recognition of the importance of middle-level management and their need for some autonomy in designing a system which meets diverse clientele needs, and increased attention to the role of the private sector. The implications for the Bank and other donors is to avoid getting caught up in the dogmatic implementation of a politically popular idea to the extent that existing practical knowledge is ignored or repressed. The costs of institutional change are too high to continually layer on a new set of staff, vehicles, buildings, and rules and regulations, every time a new idea comes along. To develop sustainable, pluralist, demand-driven extension systems, international donors in cooperation with African governments must seek ways to involve extension clientele (especially farmers associations), field level extension management, non-governmental organizations and private firms in the control of extension services.

[7] The original agreement was to add 700 staff members.

IV. Summary and Conclusion

The key elements of extension pluralism are:

1) Different strategies to meet the needs of different areas and clientele groups within one country.

2) Priority setting which is demand-driven to ensure that program planning is responsive to actual clientele needs.

4) Decentralized organization which stimulates local participation, financing, and accountability.

Pluralism when applied to extension in Africa provides a broad conceptual framework for designing specific strategies to improve effectiveness ans sustainability. In practice, for a pluralist system to reach all four major groups of farmers, it must be demand driven. There are differing degress to which private and public sector organizations providing extension services can and will serve these four groups. Larger or resource rich farmers may be able to rely primarily on private sector extension. Less powerful groups should receive public assistance to take collective action to ensure that their needs are met through the public sector and/or to help them organize into farmers associations where they can pool their resources to meet their own needs.

An important reason for developing flexible and pluralist extension systems in Africa is the expectation of economic growth and continuing stratification. The needs of clientele groups are raplidy changing and the appropriate strategies for serving them should also change. Within a pluralist system, there are many possible alternative extension strategies which can be used to address different needs within one country. Strategies requiring intensive field staff coverage such as T&V and commodity-based methods, involving high costs, may be more appropriate in situations of relatively comples technology. Whereas more general rural development strategies may be required for resource-poor areas. Top-down hierarchical strategies, reflecting the colonial legacy, are of little value in addressing the needs of resource-poor or small-scale farmers and herders.

An appropriate strategy should not be chosen only on the basis of the theoretically "best" way to serve

a specific clientele group. Extension planners should start from availability of resources and work towards a strategy which is sustainable rather than "ideal". The application of ex-ante cost/benefit analysis combined with qualitative analysis will be helpful in determining the feasibility of various strategies. In choosing one strategy over another, it is likely that trade-offs will have to be made between different objectives.

One option for setting and choosing among objectives is a demand-driven extension system in which the objectives and consequent strategies for accomplishing them are set in accrodance with clientele demands. Such a system can only be established over a long period of institutional change. The interesting question is how to attain a mix of top-down and demand-driven elements in a pluralist extension system.

Some of the options for sharing control of the extension system with clientele are: local selection of agents, cost-sharing, local evaluation of agents performance, participation in training etc. However decentralisation of power means relinquishing control and those who have power will clearly resist. Two conditions necessary for the evolution of increasingly demand driven systems to emerge are: (1) increasing cost of maintaining control on the part of governments; and (2) progressively greater perception of the benefits of sharing control on the part of both clientele and extension policy makers.

Pressure for change in extension systems in Africa comes from different sources: (1) fluctuations in the costs of production and/or the prices of products; (2) activities of political "entrepreneurs"; (3) changes in the institutional choice set which occur as governments become democratized and markets liberalized; (4) changes in non-agricultural technology; and (5) alterations in other institutional arrangements. Most of these factors cannot be measured or forecast precisely which means that one of the costs of developing more demand driven extension pluralism is uncertainty. Therefore a key factor to success is to move slowly. Initial changes required are re-focuing of objectives or mandates and increased understanding of the alternatives possible to reach them

(including assessment of costs and benefits in the field).

Demand driven extension systems in Africa will only serve the needs of small-scale and resource-poor farmers and livestock producers if those groups are able to organize themselves to pressure the government or private institutions to provide them with services. To make demand driven pluralism work there are some basic factors which are required: creativity, democracy, patience, realsim regarding the nature of bureacracy, and recognition of the past experience of extension in Africa on the part of clientele, extension personnel and other organizations. The role of the central government over time will become more regulatory and less directly involved in actual planning and implementation of extension programs. This change in governments role should also include decreased control over field staff in order to allow them to become more locally accountable. Finally, extension's role will be more than purely disseminating technology or even delivering feedback, it should be a partner, together with social scientists, researchers and politicians, in developing institutional innovations as complements to technology.

The international donors in cooperation with African governments should avoid dogmatic implementation of any set philosophy and instead focus on enabling African nations to develop sustainable, pluralist, demand-driven extension systems. A move in this direction would be to recognize and encourage the involvement of a wide variety of groups in providing agricultural information services (e.g. extension clientele (especially farmers' associations), field level extension managers, non-governmental organizations, and private firms).

CHAPTER SIX - NEEDED RESEARCH

There are many issues related to agricultural extension in Africa which require field research. To address many of these issues, research must be multi-disciplinary. Research that focuses on the overall agricultural information system in a country is especially needed. Such research on the supply of information would have a broad focus while perhaps also including the traditional measures of farmer to agent ratios, frequency of visits, changes in yields and so on. Research is especially needed on how to improve sustainability of agricultural information supply systems - including extension activities. In this regard, study is needed of how educational institutions, formal and non-formal, can be strengthened to produce extension professionals capable of meeting the increasingly complex challenges they will be required to meet.

The traditional goal of research on extension by economists has been to generate rates of return. This is difficult to do, as mentioned in chapter three, and standing alone is of limited usefulness in terms of operational benefits. Four major areas should be addressed by field research on extension. First, to understand more clearly, in both qualitative and quantitative terms, how extension (or agricultural information) systems in Africa are currently functioning and the context surrounding them. Second, to identify specific extension strategies which can address diverse problems within individual countries. Third, to quantify and/or describe the costs and benefits of such strategies. Finally, to assess the feasibility and sustainability of recommendations for improving extension effectiveness given the prevailing institutional structure.

In order to better understand the current position of extension in Africa field study is needed.[1] The

1 The World Bank is currently in the middle of two studies of the performance of the T&V approach to extension in Kenya and Burkina Faso. These studies, based on primary data being analyzed by Robert Evenson, will be the first serious evaluation efforts of T&V extension in Africa after approximately 15 years experience.

Rice (1971) study of the results of twenty years of U.S assistance to extension in the Andean countries provides an example of the magnitude of study that is currently needed in Africa. Background research for the study was gathered in the U.S. where Rice interviewed hundreds of retired U.S. program personnel and technicians. Two major field trips were made in 1968 and '69 respectively with the majority of work being carried out in nine districts spread throughout Guatemala, El Salvador, Colombia, Ecuador, Peru, and Bolivia. The 1968 trip concentrated on the analysis of institution building through extensive unstructured interviewing of extension agents, credit supervisors, farmers, shopkeepers and others. The 1969 trip looked at impact issues with numerous case studies, circulation of a questionnaire to more than three hundred extension workers in the state or national agencies and seven village level studies.

Some of the issues African studies of extension should address are those concerning resource-poor groups; for example; "How are funds for supporting agriculture currently being allocated between different groups?", "How much return is there on investments in different target groups?", and "What is the potential and desire of different target groups to pay for and control their own extension?". An interesting type of study would be a compilation of case studies (from primary and secondary data) of both autonomously formed farmers organizations and efforts to facilitate farmer participation. One output of such a study might be a table with set categories listing origin of groups, size, activity, source of funds, results, follow-up and so on. The rationale behind this would be to make more accessible some of the small-scale but valuable lessons on farmer participation in Africa. Similar study could be made of the information supply activities of private commercial firms such as input suppliers and agroprocessors.

In addition to one-time studies, monitoring of public sector extension activities, should be carried out regularly. Monitoring and evaluation (M&E) are weak areas for World Bank extension projects. Although managers may feel M&E is important, it is not pressing and therefore tends to be neglected. DeWilde argues

that monitoring should include questions concerning: (1) yield and net output; (2) adoption of recommendations and constraints to adoption; and (3) characteristics of adopters versus non-adopters. This is a very top-down monitoring format. If there is to be on-going monitoring in a responsive system, it should be designed in part by clientele and include their input.

Identifying alternatives and quantifying and/or describing their benefits and costs is somewhat of an iterative process. For example, a wish list of alternatives could be drawn up and then cost/benefit and other considerations applied. Some important questions are: (1) "What are the alternatives to a large mobile field staff and what are the relevant costs/benefits?; (2) "How much does it cost and what are the returns to helping resource-poor versus larger farmers?". In the case of a large field staff a deeper question is: "What are the advantages and disadvantages of low ratios extension/farmer ratios and how can they be measured?".

Detailed field investigations of benefits and costs associated with alternative extension systems in Africa should focus on more than measurable units such as yield increases, or increased salary per worker. Other aspects of such research might be: comparison of stated benefits with the hidden benefits driving extension systems; the distribution of benefits over time; indirect costs of extension activities (such as effects on the environment or on markets or women's labor time). Additionally, institutional issues must be considered to place quantitative results in their proper context.

In regard to research/extension linkages more information is needed on costs and benefits of improved linkage. Additional considerations are the separate questions of the comparative costs and benefits of investing in extension field staff and those relevant to researchers. In chapter four relative costs of extension and research were discussed. Evenson reported that 20 extension field staff are equal in cost to 1 researcher in Africa. In his calculation he included salaries and ancillary support (vehicles, housing etc.) not initial education costs. The

provision of support for researchers involves the purchase of many imported items; and extension seems like a "good buy" in comparison (Evenson, personal communication). Evenson's research illustrates a problem in defining extension costs by using secondary data. The costs are understated because extension field staff are inadequately supported. They are under-supported because, as discussed in chapter four, politicians benefit from having the mere physical presence of extension staff in the field even without adequate training, transport etc. If having a large, poorly trained force out in the field became unsatisfactory, for example due to increased clientele pressure, extension might be more expensive. Research which attempts to project extension costs over time should consider this factor.

Interesting field research on linkages could examine the mechanisms that would make linkages stronger. Van Crowder (1990) argues that as a part of making the research/extension system truly interactive it is necessary to build links with agricultural colleges and universities. Questions to consider in this regard are the capacity and willingness of Africa's colleges and universities to make this happen. What should the major donor function be in the process of strengthening the links between research and extension and Universities ? For example, there is currently a trend in the World Bank towards research and extension projects versus just extension alone. But what happens after the donors withdraw support for research and extension systems? Further, what are the incentives for donors to withdraw or maintain support?

It is necessary to understand the institutional context in order to decide if various options for extension are feasible and sustainable. As noted above, such research would require multi-disciplinary efforts. An example of an approach for delineating institutional elements is Bingen and Faye's (1987) method for defining the role of political factors in regard to research/extension linkages. The steps are to: (1) identify and relate different specific interest groups in the extension community; (2) outline relationships between them and researchers and research interest groups; (3) outline the relationship between the research/extension community

and the relevant government bodies (including parastatals); and (4) outline the relationship between the R/E community and the donors and IARCs. This sort of approach could be taken for a wide range of elements.

Part of researching feasibility given the institutional structure is whether or not that structure is subject to change and if so how? For example, if an obstacle to mobilizing local participation in extension is a lack of political entrepreneurs, politicians and bureaucrats who gain utility from "doing good" what can be done to increase their number? Schmid (1989) poses the question of "what learning environments produce Olson's irrational person" (p.75). A further question for research is what economic and societal incentives force an individual to stop being "irrational" in the first place ? What are the "burn-out" factors that push many idealistic young civil servants (politicians, bureaucrats, extension field staff) towards apathy and/or corruption? Can those factors be controlled or offset somehow?

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ANNEX 1: EVALUATING EXTENSION PERFORMANCE

I. Overview

The quantifiable production impact of extension programs in Sub-saharan Africa is an area of great importance for policy-makers but unfortunately one where there is little available information. There are relatively few studies which measure extension's economic effectiveness in developing countries and there are no comprehensive studies of this kind which have been completed in Africa since the large scale introduction of T&V in the 1980's.[1] There are two main types of assessments of extension: (1) studies that examine the economic impact of extension; and (2) studies of the internal efficiency of extension (Gill 1989). This section is concerned with the former.[2] Firstly, the question of how to measure economic impact of extension is discussed, and secondly the current available information on economic impact of extension in Africa is presented.

II. Methods of Measuring the Economic Impact of Extension

There are numerous methods for seeking a correlation between extension and adoption and/or yield increases. Key Issue: Want to know the quantitative net benefits - "requires not only **rigorous comparative analysis** but a formal means of establishing whether, if positive effects are observed, the effects are commensurate with the costs incurred to produce them." (Feder and Slade, 1985, p.6)

(1) Simple before and after comparison of crop yields. A major problem with this approach is that it does not separate out the contribution of extension from other factors such as:

* material inputs
* soil quality
* supply constraints
* other variables
* natural increase (autonomous) over time.

Additionally data is required from a complete analytical framework (see table # below) or else

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[1]. Two studies are underway, as mentioned in chapter two.

[2]. A discussion of the latter is in chapter six in reference to further study.

"available yield data provide only a rough measure of the effects of extension" (Feder and Slade, 1985, p.3). However, rarely is such data available. A common compromise is to use before and after data from the area where the project is undertaken. However, often such baseline information is not available from before extension activity takes place. When evaluation is limited to one square of the matrix - during and after implementation in one area - the results cannot "yield definite answers about the effects of extension" (Feder and Slade, 1985, p.4).

A Complete Evaluation Framework

	Before Project	After Project
Without project	The situation before the extension activity in an area identical to that where extension activities are planned	The situation after the extension activity in an area identical to that where the extension activities were undertaken
With Project	The situation before the extension activity is carried out in the area where it is planned	The situation after the extension activity has been carried out in the area where it has been undertaken.

Source: Feder and Slade, 1985, p.4

(2) Aggregative studies which combine extension with some other element such as agricultural research.

(3) Compare farmers who do and do not have contact with extension agents. This method fails to account for farmers passing information to each other.

(4) Measure the extent of farmer/agent interactions (visits made etc.). This focuses more on internal efficiency of extension.

(5) Examine who is being visited which focuses on equity. For example is the resource-poor farmer being reached?

(6) Farmer to agent ratios and the quality and motivation of agents or location and mobility of agents. This also focuses on the internal efficiency of the extension system.

Some of the problems with assessing the impact of extension are briefly: (1) lagged extension effects; (2) the objectives being focused on by the extension program may not be the same as those the researcher is using to show impact (eg. equity versus productivity); (3) use of aggregate data tend to over-estimate the impacts of extension whereas farm level data give more mixed results (Orivel, 1983); and (4) interaction between extension and research and other activities.

Feder and Slade (1985) argue that although there are problems of attribution "measurement of adoption rates,..., and the reasons for non-adoption, is a legitimate evaluation activity capable of yielding valuable insights for extension management and policy makers." (p.3)

III. Current Evidence

Several surveys of extension impact studies (Lockheed, Jamison and Lau 1980, Jamison and Lau 1982, Huffman 1978, Evenson 1986, Orivel 1983, Judd, Boyce and Evenson 1986, and Birkhaeuser, Evenson and Feder 1991) indicate that there are positive returns to investments in extension in developing countries.[3] The question is what is the specific evidence on the economic impact of extension in Africa?

Birkaueser et. al (1991) have summarized 36 studies, combined developed and developing. Listed below are summaries of the information on Africa taken from their study. [4]

(1) Ethiopia[5] Data were collected from 1971- 1974 on fertilizer use in 20 minimum package program areas located in different provinces of the country. Extension agents used model farmers and trial and demonstration methods. The variable measured was number of personnel in an area. "The number of extension personnel significantly increases the rate at which innovations are adopted" (B. et al, 1991, p.620).

(2) - (6) Look at impact on farm productivity.

(2) Botswana[6] variable measured is number of years of extension association, dependent variable gross output. The data was collected by the District Agricultural Office at Lobatsi between 1960 - 1967. The extension coefficient was positive and reported as significant but the r2 was very low (.058). Most of the other coefficients and other tests were not significant.

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[3]. "An exploration of the available literature in developing countries, relating extension expenditures to returns, indicates that most often reported work in this area is based on the same limited number of studies conducted during the 1970's" (Gill, 1989).

[4] The table is supplemented with information from an earlier draft of the B. et al paper.

[5]. Akilu, B. 1980. "The Definition of Fertilizer in Ethiopia: Pattern Determinants, and Implications." Journal of Developing Areas 16(3):387-99.

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(3) Kenya[7] Survey data from Vihiga Division, collected from 1970 - 1971. Two surveys were conducted in 1971, one was defined by the Special Rural Development Program. The dependent variable was maize output in bags per hectare. Some evidence of the effectiveness of group extension compared with individual extension. The r^2 was .642.

(4) Kenya[8] Data collected from 1969-1970, it was comprised of a subsample of a stratfied random sample of 1700 small farms collected for the Small farm Enterprise Cost Survey which covered maize, livestock and tea. The dependent variable was bags of maize produced. Results indicated that extension 4 - 7 visits were correlated with higher maize production than 1-3 visits. More than 2 courses had a positive correlation with maize production. 1 - 2 demonstrations also had a positive effect. The sample size was 674, r^2 was .56.

(5) Kenya[9] A sample of 152 maize farmers in Vihiga, Kenya. The data were collected during the principle planting season of 1971. Positive correlation for men with 3 years of schooling or less to extension contact, visits, courses, attendance of demonstrations on maize output/ha.

(6) Malawi.[10] Subsample of data collected by the MOA Agro-economic survey of 1978 crop. Mostly small holders growing maize. The variable is number of visits, the dependent variable is maize production in kilograms. The sample size is 150 of which only 22 were visited by extension. Coefficient positive with r^2 of .60 but the small sample of extension visitees is a problem.

(7) Cote d/Ivoire.[11] This study uses aggregate data. For cocoa the sample size was 340, and 416 for coffee. The dependent variable was the log of output per hectare of mature trees. A dummy variable for extension (if available = 1). Cocoa and coffee coefficients were positive but the t statistics are not significant and the r^2 is very low. "The availability of an extension agent showed no discernible influence on output" (B et al, 1991).

(8) 24 countries including 8 African.[12] The variable used was extension expenditures per geoclimatic region. The purpose was to measure the impact of research system on extension. The research interaction was positive for cereal crops. African extension interacted negatively with national research but positively with international. Africa has a positive coefficient for impact of research on extension but lowest relative to L.A and Asia, the Africa coefficient was significant at 10%, where L.A. and Asia were significant at 1%, finally, the r^2 good (.94)

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[9]. Moock, 1976.

[10]. Perraton, Jamison, and Orivel, 1983.

[11] Deaton, A. and D. Benjamin. 1988. "The Living Standards Survey and Price Policy Reform: A Study of Cocoa and Coffee Production in Cote d'Ivoire." Living Standards Measurement Study, Working Paper no.44 World Bank

[12]. Evenson, Robert. 1987. "The International Agricultural Research Centers: Their Impact on Spending for National Agricultural Research and Extension." Study paper no.22, CGIAR, World Bank.

but lower than L.A. and Asia.

Many of these studies have been recycled through numerous publications, they almost all are from the pre-T&V period and give no indication of the impact of the large financial commitment to extension made by the Bank in the mid-1970's which is described in chapter two.[13] Almost all the studies looked at maize production, and none of the studies focused on crops such as tubers or pulses (except for the aggregate Evenson 1987 work). As one of the key questions concerning extension in Africa is how it can be cost effective for large numbers of farmers producing low-value crops, it seems this is an area where further study is needed.

Rates of return to extension in Africa are listed by B. et al as 34% for cereals and 80% for staples (based on the Evenson 1987 study). Of all the studies reviewed in B et al only 8 calculated the net returns to extension required as a benefit stream in a rate of return calculation. The only calculation of net returns to extension for an African country is found in Evenson's aggregate study. In many studies reviewed by B. et al some areas or some crops are not as significantly affected by others and this is typically not explained. Finally, while there is evidence that extension can have a significant effect on output in Africa under some conditions, there is limited evidence regarding the impact of investment in extension from a social welfare perspective (B et al. 1991).

There is much need for more work, especially in Africa. An example of the lack of information on whether or not extension projects are succeeding in meeting their stated objectives is illustrated by the following example from the final evaluation report of the USAID Agricultural Extension, Training and Research Project (1982). The objectively verifiable indicators set up for the project were: (1) increased sorghum and (2) maize

[13]. One of the problems with efforts to evaluate the Bank-supported extension projects of the 1980's is that monitoring and evaluation systems have been very weak on the ground. Therefore data is often of questionable quality or non-existent.

production of 100% by 1995; and (3) 400 village level extension workers in the field by 1985. The report notes that, "at the end of three years it is difficult to quantify progress towards (1) and (2). However, the demonstration efforts of the National Extension Service staff coupled with indigenous seed increase, distribution of large quantities of the Sudanese improved sorghum variety, and the distribution of the improved maize composite seed to farmers is having a positive effect." This is the sort of statement that typifies descriptions of extension impact.

In terms of further research some of the questions which need answering are: (1) Are the services provided by extension causing improvements in productivity and/or farmers incomes or any other goal set for it?; (2) What is the evidence?; (3) Are the costs worth the benefits?

IV. Summary

There is rather sparse evidence available regarding the economic impact of extension. Aggregate measures are especially lacking. The large increases in expenditures on extension by the World Bank, especially in conjunction with the T&V system, have not been followed by rigorous efforts to measure their impact. Although there are serious problems in measuring this type of impact, it is important for policy-makers to have an indication of the returns to such major public sector investments as extension. Further research is needed.