LINKAGES AMONG RESEARCH, EDUCATION, EXTENSION, AND FARMERS IN THE REPUBLIC OF CAMEROON

by

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AND FARMERS IN THE REPUBLIC OF CAMEROON 

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(ABSTRACT) 

The purpose of this study was to determine the linkages 
that exist among research, extension, education, and farmers 
(R-E-E-F) and to propose ways of strengthening these 
linkages. To achieve this goal the following specific 
goals were established as the basis of this research: 

1. To describe the context in which the R-E-E-F linkage 
exists. 

2. To examine the ways that R-E-E-F functions including: 
- formal and informal linkages, 
- communication strategies, 
- feedback mechanisms, and 
- diffusion of technical information. 

3. To determine how administrators view the research, 
technology-transfer, and farmer linkage. 

The study was based on Kaimowitz et al's. (1990) 
conceptual framework for studying the links between 
agricultural research and technology transfer in developing 
countries. This framework looked at "linkage mechanisms" 
in terms of the organizational procedures used to maintain 
research-technology transfer links and "contextual factors" 
i.e., all the factors that affect the use and relevance of 
linkage mechanisms.
This study sought to identify factors that hinder effective linkage among organizations and individuals within the R-E-E-F system in Cameroon, and how these linkages could possibly be improved. The perceptions of selected individuals within the R-E-E-F system were examined. A qualitative approach to the research was used for this study. Participants included researchers from the Institute of Agronomic Research (IRA), university lecturers from the University Center of Dschang (UCD), extension agents from the Ministry of Agriculture and four other extension (rural development) organizations, administrators of all the institutions concerned, and farmers who work with these institutions. Data collection consisted of the focus group technique and the qualitative long interview. A total of 26 focus group interviews and 49 long interviews were conducted.

The study found that there were limited linkages among R-E-E-F and that most linkages were either informal or informal contacts that had been executed so often that they looked like formal linkages. Participants identified factors that hindered effective communication linkages among the R-E-E-F. They went on to recommend possible formal links that could improve the linkage mechanism within the system. These proposed linkages could be: a common institutional framework and functional linkages.
DEDICATION

This dissertation is dedicated to my entire family and especially to the following without whom I would not have had the courage to undertake and complete my program. They have added the most important dimension to my life—family and love.

To my husband Sammy, whose love, moral support, and understanding have added a new dimension to my life.

To my two wonderful daughters, Masem and Jose who have been deprived of the right to keep "mummy" on her toes during the duration of my program.

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To my brother Peter and his wife Marie whose love and care made my stay away from home an unforgettable experience. To my cousins, Gladys and John, whose love and moral support added to my strength and determination during this period.

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CHAPTER 1

INTRODUCTION

Achieving food self-sufficiency has been a major emphasis in developing countries in the last two decades. To achieve this goal a number of crucial factors come into play, of which the contribution of agricultural research and technology generation, and the contribution of extension or technology transfer are unquestionably of great importance.

Recently, the problems, challenges, and issues related to linking research, education, extension, and farmers (R-E-E-F) in developing countries have been brought to the forefront. This has become an issue because even though agricultural systems are committed to agricultural development, many constraints exist that prevent these systems from functioning effectively. Among these constraints is that of R-E-E-F linkage which is often weak and in some cases nonexistent. Structures in many developing countries concerned with agricultural problems lack the communication and administrative links to coordinate research, education, and extension effectively (Ewell 1989; Sall, Hamidou, Ousseini, & Kraft, 1986).

In response to the need to improve the R-E-E-F linkage, the respective governments, heads of institutions, and funding agencies have attempted to identify policies and organizational structures that would strengthen the R-E-E-F
relationship. To this end, a number of models are being
tried. Among the most prominent are the U. S. land-grant
model, which combines research, extension, and education in
one institution; the training and visit system (T & V),
which involves subject-matter specialists and regular
training of extension workers; and farming systems research
(FSR), which emphasizes the role of constraint diagnosis and
on-farm trials (Kaimowitz, Monteze, & Engel, 1990). Other
models and possible solutions include parastatals, which
emphasizes package formulas; setting up joint committees of
various sorts; and establishing or strengthening
agricultural information departments.

Statement of Problem

There has been much concern in Cameroon that research
results do not reach the farmer ("Access to Research," 1990;
Agricultural research knowledge and output in Cameroon, like
in a number of other African countries (Onazi, 1982), are
several years ahead of the farmer. Yet after all these
years of experience with an established extension service,
the country has yet to attain sustained economic growth in
the agricultural sector. This emphasizes the point that
agricultural research is of little value if its results do
not get to the farmer and are not used effectively (Onazi,
1982). The problem is: How can sustainable linkage
mechanisms be developed to ensure that research results get to the farmers?

One way that these results can get to farmers is through the use of an effective R-E-E-F linkage. However, in Cameroon, like in most developing countries, several factors have resulted in the lack of an effective linkage among these systems.

The organization and administration of agricultural research and extension present serious obstacles to the achievement of effective interaction between the two areas (Ewell, 1989). That situation arises in part from the fact that the two functions fall under different ministries. For several years, research fell under the auspices of the Ministry of Higher Education, Computer Services, and Scientific Research (MESURES) and is presently under the Ministry of Scientific Research; while extension is under the Ministry of Agriculture (MINAGRI). This administrative arrangement hinders the development and transfer of technology which is appropriate for small-scale resource-poor farmers, particularly those who work in relatively low potential, heterogeneous agroecological areas (Ewell, 1989).

Despite their common goal, there is insufficient cooperation between researchers and extension personnel. Both programs were established separately without built-in complementarity (Cernea, Coulter, & Russell, 1985).
The mandate for training extension agents is with the University Center of Dschang (UCD) while that for national agricultural research is with the Institute of Agronomic Research (IRA). Until recently, when IRA was placed under the auspices of the newly created Ministry of Scientific Research, these two institutions fell under MESTRES. Prior to the change, there was no built-in mechanism for the two agencies to complement each other.

Arnon (1989) and Feliz (1989) indicated researchers are usually more academically qualified than extension agents. The two groups are always separated by gaps in educational level, status, salaries, and social class. Agents get blamed for failure to transfer innovations which have shown promise under experimental conditions and for apparent inability to provide systematic feedback.

Farmers, on the other hand, see the agents as incapable of providing answers to local problems and needs (Collinson, 1985). A lack of communication between extension agents and farmers makes it even more difficult to establish communication linkages between researchers and farmers. Researchers (whose numbers are usually far less than the number of extension agents) are generally dependent upon extension workers for information about farmers' problems, needs, and interests. The failure of many agricultural programs has been attributed to the lack of understanding
among farmers, extension agents, and researchers. During the last decade, a strong concern has developed for the achievement of better interaction among technical research scientists, extension agents, and farmers in order to promote more relevant and effective agricultural programs.

**Purpose of Study**

The purpose of this study was to determine the linkages that exist among research, education, extension, and farmers (R-E-E-F) and to propose ways of strengthening these linkages. To achieve this goal, the following specific objectives provided the basis of the research:

1. To describe the context in which the R-E-E-F linkage exists.

2. To examine the ways that R-E-E-F functions including:
   - formal and informal linkages,
   - communication strategies,
   - feedback mechanisms, and
   - diffusion of technical information.

3. To determine how administrators view the research, technology-transfer, and farmer linkage.

**Significance of the Study**

Kaimowitz et al. (1990) reaffirmed the general belief that a high level of coordination, collaboration, and communication enhances the level of integration among R-E-E-F. They stated that "international agriculture technology systems (IATS) which regularly make available relevant new technologies exhibit high levels of integration between research and technology transfer" (p. 235).
The underlying goal of on-farm research or research in general is to help meet the needs of specific clients, most commonly resource-poor farmers. However, accomplishment of this goal depends on how much technology is produced, how effectively it is promoted, and how reliable the inputs and services needed by the producers are.

Findings from this research have policy implications for institutional organizations. Insight into the different communication strategies suggests ways of improving and strengthening linkages among all four components of the R-E-E-F system.

**Conceptual Framework**

Many studies and program evaluations have identified weaknesses in the links between institutions for agricultural research and those concerned with transferring technology to farmers as major obstacles to the development and application of beneficial new technologies in developing countries (Arnon, 1989; Cernea et al., 1985; Kaimowitz, 1987; World Bank, 1985). However, these studies did not take into account the various aspects of the local situation and failed to provide concrete bases for practical solutions. In 1987 the International Service of National Agricultural Research (ISNAR) initiated a study in several developing countries which resulted in the development of a conceptual framework for studying the links between
agricultural research and technology transfer in developing countries (Kaimowitz et al., 1990). This study looked at "linkage mechanisms" in terms of the organizational procedures used to maintain research, technology transfer links, and "contextual factors" (all the factors that affect the use and relevance of linkage mechanisms). Linkage mechanisms may be internal in that they could be controlled or influenced by the leaders of the institutions, or they could be external where they would be influenced by the institution’s broader physical, historical, agroclimatic, political, and socioeconomic environment. These concepts had earlier been expressed by Biggs (1989) and Merrill-Sands and McAllister (1988).

The present study is based on the Kaimowitz et al. (1990) conceptual framework.

This framework includes four key concepts:

1. Research and Technology Transfer
2. Technology Transfer or Extension
3. Institutional Agricultural Technology Systems (IATS)
4. Links and Linkage Mechanisms

**Research and Technology Transfer**

This framework views the terms "research" and "technology transfer" as having both functional and institutional meanings. The functional meaning relates to tasks involved in the development and delivery of technology. The institutional meaning relates to the
institutions and personnel responsible for carrying out this process.

The main tasks for research would be discovery, exploratory development, and technology consolidation (Kaimowitz et al., 1990):

**Discovery.** "The process of collecting information and/or searching for relationships between variables, the specific usefulness of which is as yet undetermined" (p. 229) i.e., basic research.

**Exploratory development.** "The identification, understanding and control of the interaction between a proposed technology and the physical, economic and/or social environment in which this technology will ultimately be used" (p. 230) i.e., applied research.

**Technology consolidation.** "The process of translating the results of basic and applied research into specifications for a new technology and of ensuring that these specifications are appropriate for the type of farmers for whom the technology is intended" (p. 230) i.e., adaptive research that also includes all the work which is carried out to determine how to present and package a new technology and to identify exactly who might be interested in using it.

The main tasks for technology transfer are technology production, delivery of technologies to farmers, and
monitoring and evaluating the use of technology (Kaimowitz et al., 1990):

**Technology production.** "The process of producing the materials (physical inputs and/or information) in sufficient quantity and of making these materials available to those responsible for technology delivery" (p. 230).

**Delivery of technologies to farmers.** "The process in which the technology is promoted and distributed to farmers" (p. 230).

**Monitoring and evaluating the use of technology.** "Involves ascertaining whether farmers have acquired the new technology, assessing the extent to which they adopt, adapt or reject it, and identifying the reasons underlying their response to it" (p. 230).

**Technology Transfer or Extension**

The term "technology transfer" goes beyond the "education/ information" emphasis usually carried by extension. It includes the role of inputs and services in technology development and delivery. It also includes those services provided by the conventional public sector extension services as well as other institutions or organizations, such as private firms, parastatals, nongovernmental organizations (NGOs), formal educational institutions, and producers' associations (Kaimowitz et al., 1990). For the present study extension and technology
transfer will be used interchangeably since the institutions involved fall under one of the above definitions and in some cases could be identified with both.

**Institutional Agricultural Technology Systems (IATS)**

Included in the IATS are all the individuals, groups, organizations, and institutions engaged in the development and delivery of new or existing technology. These different IATS members could be linked through their common geographical foci or a common commodity focus or by both (Engel, 1988, cited in Kaimowitz et al., 1989).

To carry out their various tasks effectively, the members of the IATS engage in a number of basic activities which could be categorized thus:

- those concerned with problem identification and the acquisition, transformation, storage, retrieval, dissemination and use of knowledge;

- those concerned with the production of material goods including conceptualization, design, prototype production, testing, multiplication, packaging and distribution;

- those concerned with the management of and administrative support for the above activities. (Kaimowitz et al., 1990, p. 232)

The various types of skills involved in these categories range from "specific technical and socioeconomic skills to more general managerial, communications and participation skills" (Kaimowitz et al., 1990, p. 232). These skills and individual research activities should however be coordinated
or programmed so as to provide a single focus and not be a series of unrelated projects (Pinstrup-Anderson, 1982).

**Links and Linkage Mechanism**

Having defined "research" and "technology transfer" as functional and institutional, this framework also considers the links between them as being functional and institutional. Functional links relate to research and technology transfer activities whose main aim is that of bridging the gap between these two units. Institutional links relate to institutions and personnel that carry out activities that would result in the exchange of resources (e.g., information, money, labor, and materials) between institutions and personnel. The organizational procedures used to establish, maintain, or improve links are termed "linkage mechanisms" and could be characterized according to the following attributes (Kaimowitz et al., 1990, p. 233):

- whether they are formal or informal, regular or ad hoc, mandated or voluntary, permanent or temporary;

- whether they are facilitative mechanisms (that is, they provide resources) or control mechanisms (that is, they determine how resources should be used) (Leonard, 1982, p. 36);

- the amount and type of resources exchanged;

- the administrative level at which they operate;

- whether they focus on programming activities or are concerned with implementation or evaluation; and

- the numbers of individuals involved.
Even though formal links are supposed to follow a standard pattern, it is usually difficult to have a clear-cut distinction between informal and formal links. Formal linkages include: committees, task forces, liaison departments and officers, subject-matter specialists, agricultural communications units, preextension units, research conducted by development agencies, farming systems programs, joint activities, publications, presentations and demonstrations, staff exchanges, interagency agreements, service provision, joint plans, matrix management, shared supervisors, policy mandates, and meetings. Informal mechanisms, on the other hand, consist of communication and exchange of resources without official sanction or through personal contacts.

Kaimowitz et al. (1990) stressed in the general framework the significance of environmental factors that would affect the performance of IATS and their links. Among these factors are "the availability of different communications channels, the development of the necessary infrastructure and traditions for farmers to make use of inputs and information produced outside their communities" (p. 266). Kaimowitz et al. (1990) pointed out that different types of technologies require different types of linkages and, in particular, existing technologies will require different types from new ones.
Kaimowitz et al. (1990) addressed personnel problems which arise from differences between researcher and technology transfer staff (in background, training, experience, responsibilities, status, and physical location) as part of efforts to increase system integration. They also indicated that since management has limited control over financial policies, its influence could better be channeled through organizational structure and personnel management.

Finally, this framework proposes that:

High levels of integration are facilitated by interdependence, domain consensus, domain correspondence, ideological consensus, competence and the capacity to deliver on agreements. The creation of superordinate goals and the promotion of an institutional culture conducive to integration are also important. These systems have many formal and informal linkage mechanisms, at multiple administrative levels. Many have liaison positions and departments, but these complement, rather than substitute for, more direct links. (Kaimowitz et al., 1990, p. 267)

Presently, the Cameroonian economy faces financial limitations. Hence, any impact on the R-E-E-F system would almost invariably be made through organizational structure, personnel, and communications management. This position is advocated by Kaimowitz et al. (1990) in their framework. Hence it is an appropriate basis for the accomplishment of the objectives of this study.
Summary

This chapter examined the problem that this study addressed. How can sustainable linkage mechanisms be developed to ensure that research results get to the farmers?

The purpose of this study was to determine the linkages that exist among research, education, extension, and farmers (R-E-E-F) and to propose ways of strengthening these linkages. Specific objectives identified in the chapter that provided the basis of this research were:

1. To describe the context in which the R-E-E-F linkage exists.

2. To examine the way that R-E-E-F functions including:
   - formal and informal linkages,
   - communication strategies,
   - feedback mechanisms, and
   - diffusion of technical information.

3. To determine how administrators view the research, technology-transfer, and farmer linkage.

Also examined in this chapter was the conceptual framework on which this study was based. Kaimowitz et al. (1990) developed a framework for studying the links between agricultural research and technology transfer in developing countries. This framework included four key concepts:

1. Research and Technology Transfer
2. Technology Transfer or Extension
3. Institutional Agricultural Technology Systems (IATS)
4. Links and Linkage Mechanisms
CHAPTER 2
REVIEW OF RELATED LITERATURE

A comprehensive review of available literature shows a consensus of the magnitude of linkage problems in the developing countries:

The poor interorganizational relations between the extension agency and the research organization almost guarantee that research results will not reach farmers, and if they do, farmers will not be able to use them. (Kaimowitz, Monteze, & Engel, 1989, p. i)

Bridging the gap between research and extension is the most serious institutional problem in developing an effective research and extension system. (World Bank, cited in Kaimowitz et al., 1989, p. i)

All the 12 countries (in which research projects were evaluated) had difficulties of communication between research institutions and extension agencies. (Food and Agriculture Organization, cited in Kaimowitz et al., 1989, p. i)

Weak linkages between the research and extension functions were identified as constraints to using the research in 16 (out of 20) of the projects evaluated. (United States Agency for International Development, cited in Kaimowitz et al., 1989, p.i)

Despite these concerns the search revealed that little research has been conducted focusing on linkage and linkage mechanisms between and among institutions charged with technology generation and technology transfer activities.

The first major international study was the ISNAR comparative study initiated in 1987. There are however, several evaluation reports, reports of personal experiences, and results of practical attempts to improve linkages.
This chapter is divided into six sections of which the literature examined reflects the different study objectives. Section one reports on literature related to research, technology transfer, and farmer interface. This is followed by a look at research-university-extension linkage. Next comes a section on communication and personal linkages between research and extension workers, followed by an examination of linkages between the agricultural research organizations and extension service with policy makers. Section five covers researcher-farmer/extension agent-farmer interface, while section six pays particular attention to agricultural research done in Cameroon.

**Research, Technology Transfer, and Farmer Interface**

Traditionally, the relationship that exists among researchers, extension workers, and farmers is one in which research results are communicated to the farmer and the farmer’s problems are in turn transmitted to the researcher by the extension worker. This traditional model portrays a very simplistic situation which may not always be the case and may be misleading. In practice these relationships among researchers, extension workers, and farmers are more complex. Arnon (1989), however, pointed out that this stereotypic model sometimes only ensures that the research worker will be effectively insulated from direct contact with farmers. It is necessary that proper and effective
linkages exist between the different subsystems in order to ensure the relevance of technology generated to the farmers' needs and to facilitate the process of dissemination of information to farmers. Without the appropriate linkages, situations which could be detrimental to the entire system could arise (Arnon, 1989).

Elz (1984) concluded that in the absence of proper linkages, agricultural researchers and extension workers blame each other if the farmers ignore their message. These views were echoed when Compton (1989) pointed out that researchers tend to view the extension agents as unwilling to adopt research information and also unwilling to help the community in the solutions to its field problems.

In their 1982 annual report, ISNAR teams found that in many countries no close links existed between research and extension workers. Extension workers pass on improvised technical messages, whereas researchers carry out some research in isolation, building up technical solutions of which many are unusable or never get used.

Kaimowitz (1987, p. 109) confirmed these concerns when he wrote:

Repeatedly, around the world, the linkages between research and extension have been identified as one of the weakest areas of agricultural technology systems. Moreover, linkage problems are not unique to developing countries, agriculture, or the public sector. We have encountered numerous examples in the literature of similar problems in developed capitalist and socialist countries, in industry, and in the social sciences. In
fact, problems in this area appear to be universal and may indeed to some extent, be inevitable. What makes the linkage problem particularly severe in public sector institutions charged with promoting agricultural development in developing nations is the general weakness of these institutions, the great cultural and educational differences which exist between researchers, technology transfer workers, and farmers in these countries, and the urgency of their need to increase agricultural production, particularly among small producers.

Earlier, Fernandez (cited in Arnon, 1989) surveyed staff members in six research institutes and eight extension services in Latin America. He found out that "82% of the researchers felt extension personnel made too little effort to learn about and to transfer the technologies generated, and 75% of the extensionists felt that the new technology was not acceptable to smallholders" (p. 786).

Merrill-Sands and McAllister (1988) pointed out that the worldwide problem of hierarchy and prestige in agricultural science was part of the linkage problem. They reported that in most of the programs they studied, the most common problem was that of maintaining effective two-way communication between lower-status field researchers in on-farm programs and their higher-status colleagues in experiment stations.

Baharsjah (1985) concluded that:

The main issues in the linkage between research and extension are how and with what mechanisms to communicate the research results to the respective users and how and with what mechanisms to transmit users' needs and problem to the research institutes. This must be accomplished as effectively and efficiently as possible, in a relatively short time and
at the lowest possible cost in manpower and funds. (p. 32)

Samy (1988) surveyed researchers and extension agents in San Cristobal, Dominican Republic. His findings showed a lack of coordination between the researchers' activities and the agents' activities.

**Research-University-Extension Linkages**

The links between public funded agricultural research and university research in developed countries are weak or nonexistent except at the personal level (Arnon, 1989). This is because research audiences served by these two organizations have different goals. This situation creates a dual system of research which has a raison d'être in the developed countries, but could be seen as a luxury that most developing countries cannot afford. According to Arnon, these two units can work together in several ways hence complementing each other's efforts:

1. Participation of the universities in research planning panels at national and regional levels,
2. Contract research by faculty/staff on behalf of the national research institute,
3. Teaching appointments for the research institution staff at the faculties of agriculture, and
4. Joint university-research institute graduate and post-graduate training programs. (Arnon, 1989, p. 808)

It is equally as important for the university to collaborate with the research institute as it is for them to have feedback from extension services about the problems of
farmers. Officials at the Regional Office for Asia and the Pacific/Food and Agriculture Organization (1985) believed that this will help the universities plan and improve their teaching and research methods to meet national and farmers' needs. They go on to say that while the university benefits from extension, extension in turn gets its training from the university. Linkages between the two units are therefore mutually beneficial.

**Communication and Personal Linkage Between Research and Extension Workers**

Rogers and Kincaid (1981) defined linkage as a communication relationship between two units (usually individuals although the units may be groups or organizations) in a system. In order to build effective links between these units, it is necessary that those participating within the system share values, attitudes, beliefs, and goals which motivate them to relate to each other as well as possible (Bennell, 1990).

Arnon (1989) pointed out how important personal linkages between researchers and extension workers are when he stated that:

> Ultimately, the linkages are performed by individuals; it is therefore, at the personal level that the opportunities for fruitful cooperation between the two services have the greatest potential. It is, however, also at this level that problems are most apt to arise because of personal incompatibilities or narrow ambitions. Individuals may lack motivation or incentives for carrying out joint functions. They may
feel antagonistic to their professional counterparts and have little respect for them. (p. 795)

In looking at the political economy of the development and transfer of agricultural technologies, Sims and Leonard (1990) concluded that "the efficacy of formal links is shaped by professional values, the strength of incentives to cooperate and the extent of support from local, national and donor interest groups" (p. 61).

Samy (1988) pointed out that formal coordination between research and extension involves information exchange among different levels (national, regional, and district) of both organizations through joint meetings and technical committees. Exchanging technical reports and journal articles may also be part of this mechanism of information transfer.

These same thoughts had been expressed by Lionberger and Chang (1970) in their study of the Taiwan agricultural information system. They found that the exchange of professional journals and research reports as well as individual and group contacts formed an effective part of the communication channel.

Fernandez (cited in Samy, 1988) on the other hand found these types of communication strategies to have low effectiveness in many of the Latin American countries. According to Fernandez "this lack of effectiveness is the result of low credibility of the researchers in the eyes of
the extension staff, and insufficient confidence in the new technology itself" (Samy, 1988, p. 57). These conflicting results confirm the need for adaptive research and methodologies throughout the system and the need for location specific orientation.

**Linkages Between the Agricultural Research Organizations and Extension Service With Policy Makers**

In order for research to be effective it must promote agricultural development. At the same time policy makers must be comfortable in embracing its values. It is, therefore, imperative that policy makers, researchers, extension agents, and farmers have appropriate communication channels.

The debate continues as to the most effective administrative style. Those that have been looked at are combining research and extension under the umbrella of the same institute or having them separate as is the case in most developing countries. Integrating research and extension in a single unit may not necessarily be the answer.

While visiting some countries in which research and extension were separate, Howell (1984) received complaints that this separation impaired effective extension support. But similar complaints were also made when he visited countries in which the two services were located in the
Ministry of Agriculture. These findings show that combining the two services under the same administration does not necessarily mean good collaboration.

Arnon (1989) wrote that it is quite possible to "improve working relationship between the two services even if they function in two separate, though closely linked, administrative frameworks" (p. 791). He stressed that even though the nature of linkage required by each of these services is entirely different, "a strong linkage with the authorities and bodies responsible for development is absolutely vital for both services" (p. 790).

Regardless of the style pursued, ultimately, linkage activities are performed by individuals. It is also interesting to note that behavior is influenced by training, experience, and incentives (Kaimowitz, 1987). Therefore, policy makers should be educated about the potential contribution that research can make to agricultural development. Research shows that policy makers tend to undermine work done by researchers and dismiss it as irrelevant to their problems and expressed in an incomprehensible jargon (Vinya, 1979) or a luxury and financial liability (ISWAR, 1985). Venkatesan (1985) believed that requiring administrators to attend periodic refresher courses to update their knowledge of the changes in agricultural conditions and technology could improve
their perceptions of the value of work done by researchers and their subsequent working relations with researchers.

In examining extension’s links with policy makers, Arnon (1989) pointed out that "the political environment in any country is as critically important to the success or failure of an extension effort as it is for research" (p. 810). It is, therefore, necessary for extension to forge strong linkages with the different governmental arms responsible for planning, strategy, and policy (Biggs, 1989; Watts, 1984). Through these linkages, government officials and politicians could be made aware of the complex social, cultural, economic, and institution problems involved in the adoption process which sometimes account for a slow adoption rate (Arnon, 1989).

**Researcher-Farmer/Extension Agent-Farmer Interface**

Obtaining information about farmers’ needs, problems, and acceptance of new technology is as important to the extension agent and the farmer as it is to the researcher. The researcher-farmer linkage is recently being achieved through adaptive research carried out by FSR teams in the form of on-farm trials and through integration between units (Coulter, 1984; Mehta, 1984).

Although the presence of a high level of integration between these units is not a guarantee that relevant new agricultural technologies will regularly be made available,
Kaimowitz et al. (1990) pointed out that a high level of coordination, collaboration, and communication enhances the level of integration between them. They further stated that institutional agricultural technology systems which regularly furnish relevant new technologies exhibit high levels of integration between research and technology transfer. Besides interacting with farmers and researchers, a tremendous amount of interaction takes place within the extension service itself at different levels of responsibility (extension, administrators, training officers, subject-matter specialists, and village extension agents).

Farmer-extension interaction is another critical interface in the sense that it requires strong interpersonal communication skills, along with other social skills, and it usually involves individuals or groups from different cultural, social, and educational backgrounds. Usually farmers and extension agents both operate on the basis of two different bodies of knowledge: (a) the institutionally organized knowledge systems (IOKS) or scientist-derived knowledge used by extension, and (b) the indigenous knowledge systems or farmer derived knowledge. As Chambers and Glidyal (1985) pointed out:

Modern scientific knowledge is centralized and associated within the machinery of the State; and those who are the bearers believe in its superiority. Indigenous technical knowledge (ITK), in contrast, is
scattered and associated with low prestige rural life; even those who are its bearers may sometimes believe it to be inferior. It is difficult for some scientists to accept that they have anything to learn from rural people, or to recognize that there is a parallel system of knowledge to their own, which is complementary, usually valid, and in some respects superior.

Research and Technology Transfer in Cameroon

Tchouamo (1987) conducted a study in Cameroon titled "Perceptions by Farmers, Extension Agents and Researchers of Linkages Among and Between Organizations Involved in the Development and Dissemination of Agricultural Innovations in Cameroon." The survey was conducted only in the Western Province. The survey included farmers from the West Province who were involved with the production of maize and Arabica coffee. It also included agricultural researchers of IRA, extension agents of MINAGRI, and the staff of the Rural Development Project.

The survey findings showed that the respondents from the respective groups believed that interaction among peers and between groups was important for the development and dissemination of innovation. This interaction, they believed, was a means for improving services to potential users and to the profession.

The survey also showed that respondents were in favor of the integration of the major components of the agricultural system, holding that this arrangement would lead to better utilization of scarce resources. Some of the ways by which linkages could be strengthened between and
among researchers, extension workers, and the farmer was by committees, workshops, planning, and on-farm trials.

Based on his findings, Tchouamo (1987) recommended that future research include studying of other key groups in the agricultural input, marketing, and policy-making subsystems as these might "identify strengths and weaknesses in the present arrangements for communication within, between and among research, extension and farmer" (Tchouamo, 1987, p. 280). He further recommended the study of patterns for dissemination of information from research and the farmers' receptiveness to research derived recommendations.

Earlier, Kelso and Gervais (1983) carried out a USAID/MINAGRI sponsored study of the food crops component of the Cameroon extension program and the feasibility of establishing technical support centers. Included in the study were officials and representatives of the national organizations at the central level who were associated with the food crops program and provincial officials of MINAGRI, IRA, higher education institutions training centers, seed multiplication units, and representatives of integrated development projects and societies.

Findings of this study included the following linkage-related issues (Kelso & Gervais, 1983). Firstly, only a limited number of IRA annual technical reports are printed and are mainly used by the stations as a means of reporting
their research activities to upper level administration or supporting donors. These reports are not widely made available to technology transfer agencies and agents, hence valuable information generated by IRA food crop research is not being utilized for the benefit of farmers.

Secondly, formal communication channels between a chief of post (extension) and the research personnel of an IRA station (in the same locality or county) were plagued with several administrative "bottlenecks." Any information required by the chief of an agricultural extension post had to be obtained by a formal letter. This letter

must traverse the MINAGRI Division and Provincial Delegates up to the Minister and downward through General Delegation for Technical and Scientific Research (DGRST) to the Director of IRA, then to the research center and finally to the research station. (Kelso & Gervais, 1983, p. 33)

The study, however, showed good informal relations in most provinces between MINAGRI provincial delegates and the directors of IRA centers and stations. Specifically highlighted was the good cooperation found to exist between IRA stations and MIDENO, High Plateau of the West, and SODECOTON.

Kelso and Gervais (1983) recommended that:

Training and demonstration centers should be established to strengthen the training of MINAGRI extension monitors in all important food crop production areas.

A comprehensive technical package should be developed for food crops and made available to all Cameroonian
agencies that have food crop components in their scope of activities.

The technical function in the central office of extension service/Yaounde should be strengthened and its linkage to the provincial chief of extension service made direct for communication of technical matters and assistance. (pp. 33-34)

Summary

The literature revealed that the R-E-E-F relationships are complex. Without proper and effective linkages among the different subsystems, situations which could be detrimental to the entire system could arise. It also showed that several factors contribute to weaknesses in the R-E-E-F linkage. A lack of coordination and contact among systems could lead to duplication of research efforts and conflicting messages to farmers.

Informal communication, especially individual contact, was pointed out as a very important factor in the R-E-E-F interaction. This could involve information exchange at various levels of the different organizations in the form of joint meetings, technical committees, and exchange of technical reports and journal articles.

In looking at the relationship between research organizations and policy makers, the literature pointed out that it is not enough to just do good research if it does not contribute to agricultural development. Policy makers who remain skeptical about the value of research should be enticed to visit the research stations, see on-farm trials and pilot farms. They should be invited to
attend research seminars to present their problems and to learn what is being done to solve them. They should also be involved in the research planning. (Arnon, 1989, p. 807)

Finally, the literature revealed that linkage between extension services and university education is important. This link is necessary since educators need feedback on farmers' needs and problems in order to improve teaching and make the research relevant to farmers' situations.
CHAPTER 3

RESEARCH METHODOLOGY

Due to the exploratory nature of this study and the complexity of questions being examined, the qualitative methodology was the strongest approach to use in this research. Accordingly, a series of field observations, in-depth interviews and focus groups were used to obtain an understanding of the R-E-E-F linkage while laying a foundation for current and future comparative work. This allowed participants to describe the system as they saw it and to contribute their ideas as to how they would like to see the system run. Conclusions and recommendations rely heavily on participants' views as opposed to inferences and possible conclusions drawn from participants' nominal answers.

The purpose of this study was to determine the linkages that existed among research, education, extension, and farmers (R-E-E-F) and to propose ways of strengthening these linkages. To achieve this goal, these specific objectives provided the basis for the research:

1. To describe the context in which the R-E-E-F linkage exists.

2. To examine the ways that the R-E-E-F linkage functions including:
   - formal and informal linkages,
   - communication strategies,
   - feedback mechanisms, and
   - diffusion of technical information.

3. To determine how administrators view the research, technology-transfer, and farmer linkage.
For this study the qualitative long interview and the focus group methods were used in conjunction with on-site field observations. Personal interviews were conducted using guidelines for conducting long interviews (McCracken, 1990) with researchers, extension agents from the different agencies, university lecturers, administrators, and farmers. Focus group techniques (Morgan, 1990) were used to collect data from researchers, extension agents, and farmers.

Selection of Informants

Because of the way in which research and technology transfer have developed in Cameroon, several types of extension methods are used in the country. It would be reasonable to assume that different organizational and operational structures would affect the types of linkages formed with other organizations. Literature showed that there were very limited linkages (generally at field level) between research and other institutions within the R-E-E-F system. These linkages were generally "established through agreements (protocols) between IRA and the respective executing institution" (World Bank, 1990, p. 9). Of these linkages one main link stood out--the involvement of most of the institutions within the R-E-E-F system with IRA's on-farm Testing and Liaison Units (TLU) of the National Cereals Research and Extension (NCRE) projects. The TLUs are represented in the various agroecological zones of the
country. The TLU linkage was used as the primary requirement for selection of technology transfer agencies that were included in the survey.

The next task was to select the particular parastatals to participate in the study. In the North and Extreme North provinces, there are two main parastatals that work with the TLUs—Société de Développement du Coton (SODECOTON), and the Société de Modernisation du Riz de Yagoua (SEMRY). The names of these two institutions were written on two separate pieces of paper, twisted and put in an envelope. This was then shaken and one selected. This turned out to be the Société de Développement du Coton (SODECOTON). Upon arrival in Cameroon for the field work, a series of meetings were held, first with two technical assistants (TA) with the TLU program, one of the technical advisors of the Ministry of Agriculture, and then with the team leaders of the respective TLUs. The TAs verified and documented the different institutions which had been selected to participate in the study including SODECOTON. This verification was necessary since field conditions and organizational structures have been undergoing numerous changes. Table 1 shows the different organizations involved in the survey and how they are geographically located and classified.

Contact visits were then made to all four zones involved in the study. Here meetings were held with TLU team leaders
### Table 1

#### Study Area

<table>
<thead>
<tr>
<th>Zone</th>
<th>Province</th>
<th>Agency, Agents/Researchers</th>
<th>Model</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>Center</td>
<td>1. Ministry of agriculture extension agents (both NETP and regular)</td>
<td>Modified T &amp; V system^a</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2. Société de Développement du Cacao (SODECAO)</td>
<td>Parastatal</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3. IRA - Researchers</td>
<td>Research</td>
</tr>
<tr>
<td>II</td>
<td>South West</td>
<td>1. Ministry of agriculture extension agents</td>
<td>Modified T &amp; V system</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Research</td>
</tr>
<tr>
<td>III</td>
<td>North West</td>
<td>1. Mission de Développement de la Province du Nord-Ouest (MIDENO)</td>
<td>Cooperative T &amp; V system</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2. IRA - Researchers</td>
<td>Research</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3. University lecturers Dschang</td>
<td>Education</td>
</tr>
<tr>
<td>IV</td>
<td>Extreme-North</td>
<td>1. Société de Développement du coton (SODECOTON)</td>
<td>Parastatal</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2. IRA - Researchers</td>
<td>Research</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3. Ministry of agriculture extension agents (NETP)</td>
<td>Modified T &amp; V system</td>
</tr>
</tbody>
</table>

**Note.** Also interviewed were administrators of these different institutions and farmers from the different provinces who work with these institutions.

^aT & V system—systematic visits of extension agents to farmers and farmers groups, accompanied by intensive supervision and training of agents, and strong linkage with research.
and department heads of agencies concerned who helped identify possible informants from the different institutions concerned. Letters of introduction (Appendix A) were then prepared by the TLUs to administrators of the different agencies. After giving their input on selection of villages and informants to include in the study, appointments were set up for interviews which were held on later dates. The TLUs in the respective zones coordinated the interview schedules in their areas (Appendix B).

The next step consisted of a series of four trial-run interviews, two of which were long interviews and two of which were focus group interviews. These were then followed by two other interviews which were observed by Dr. J. Dale Oliver, the research advisor (Appendix C). These six interviews were then evaluated and necessary adjustments made with respect to interview technique and equipment used.

There were five targeted populations:

1. Researchers,
2. University lecturers,
3. Technology transfer agents (TTA),
4. Administrators of these three units, and
5. Farmers.

Researchers interviewed included both on-station and on-farm researchers involved in generating improved technology for food crop production and the dominant cash crop associated with each of the selected parastatals (Appendix D).

University lecturers interviewed included those who are more
involved with rural education and the research and outreach mission.

Technology transfer agents included agents from the regular core of Ministry of Agriculture extension agents in the different provinces and those involved in the Ministry of Agriculture's National Extension Training Project (NETP). Also included were extension agents of the different parastatals that engage in agricultural technology transfer activities. The farmers interviewed for this project were those who work with the respective agencies in the different agroecological zones.

Key informants for the study were determined by theoretical or judgmental sampling procedure (Jorgensen, 1989). This nonprobability sampling procedure allowed the researcher to make selection decisions based on "constraints such as opportunity, personal interest, resources, and most important, the problem to be investigated" (Jorgensen, 1989, p. 50). Jorgensen further pointed out that "as in probability sampling, the researcher develops a logic for selecting particular phenomena for study. What logic is appropriate depends on the nature of the problem to be studied" (Jorgensen, 1989, p. 50). Similarly, the "researcher generally is able to estimate the likelihood that these observations are appropriate and representative of the phenomenon studied" with the exception however that the
researcher will be "unable to sample or estimate error by recourse to simple statistical formula" (Jorgensen, 1989, p. 50). In this case, selection of key informants was made with the help of the professional judgments of the regional TLU team leaders, appropriate department heads of the various institutions concerned, and the researcher's personal decision making skills. Selection took into account potential informants' proximity and familiarity to the problem, field experience and familiarity to cultural and local practices, and resources available to the researcher.

Field Work Procedure

Focus Group Interviews

Data on farmers', TTAs', and researchers' perceptions of the different types of communication strategies and mechanisms used to get information and new technology to farmers and also to get feedback from the farmers were gathered by organizing focus groups. Also examined by focus group interviews were researchers' and TTAs' perceptions on types of linkages, communication strategies, feedback mechanism, and diffusion of information among the different institutions involved in the study.

The focus group is a specific group interviewing technique used to collect qualitative data. "The hallmark of focus group is the explicit use of the group interaction to produce data and insights that would be less accessible
without the interaction found in a group" (Morgan, 1990, p. 12). This form of data collection could be used for:

- orienting oneself to a new field,
- generating hypotheses based on informants' insights,
- evaluating different research sites or study populations,
- developing interview schedules and questionnaires, and
- getting participants' interpretation of results from earlier studies. (Morgan, 1990, p. 11)

This technique calls for a group size of about 6 to 10 participants (Morgan 1990). However in some cases, especially in dealing with researchers, the total numbers of those involved in the survey in certain stations were less than six. Because of employee strikes, limited funds, and time available to the researcher at the time of the survey, it was impossible to arrange long interviews in these stations. This meant that the focus group surveys were conducted with less than six participants in these stations. Extension agent focus groups were conducted with a minimum of 10 participants per group. Table 2 shows the number of focus group interviews carried out in the different provinces.

In each zone a group of 12 farmers was systematically selected from official lists of those who normally work with agents of the agency in question. Focus group interviews were then carried out with these groups. In some cases, however, interviews were carried out with already existing work groups of farmers who participate as a unit in their daily activities with agents. However, in each village (depending on the type
### Table 2

**Number of Focus Group Interviews**

<table>
<thead>
<tr>
<th>Province</th>
<th>Researchers</th>
<th>Lecturers</th>
<th>TTA</th>
<th>Farmers</th>
<th>Admin</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Center</td>
<td>2</td>
<td>-</td>
<td>2</td>
<td>2</td>
<td>-</td>
<td>6</td>
</tr>
<tr>
<td>SW</td>
<td>3</td>
<td>-</td>
<td>1</td>
<td>2</td>
<td>-</td>
<td>6</td>
</tr>
<tr>
<td>West</td>
<td>-</td>
<td>-</td>
<td>1</td>
<td>2</td>
<td>-</td>
<td>3</td>
</tr>
<tr>
<td>NW</td>
<td>1</td>
<td>-</td>
<td>1</td>
<td>2</td>
<td>-</td>
<td>4</td>
</tr>
<tr>
<td>Ex N</td>
<td>4</td>
<td>-</td>
<td>2</td>
<td>3</td>
<td>-</td>
<td>9</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>10</strong></td>
<td>-</td>
<td><strong>7</strong></td>
<td><strong>11</strong></td>
<td>-</td>
<td><strong>28</strong></td>
</tr>
</tbody>
</table>

**Note:** Focus groups ranged in size from 2-15 persons. The farmer' groups ranged from 10-15 persons. The technology transfer agents' (TTA) groups ranged from 8-15 persons. The researchers groups ranged from 2-10 persons.
of information gotten from the focus group interview and the group dynamics), one or two individual farmers who did not participate in the focus interview were deliberately selected and a long interview conducted with them. These second set of long interviews served both as a backstop and control for bias in the makeup of informants in focus groups and as an additional source of information.

The atmosphere during the interviews was kept as informal as possible so that participants would feel relaxed enough to talk freely and honestly. The seating arrangement for group interviews was in a circle sometimes under a tree, in the town hall, in a classroom, or in a conference room depending on where the group felt most at ease. As in the long interviews, after thanking participants for their willingness to participate, and after discussing my background they were assured of the confidentiality of their answers. In both types of interviews the questions asked were very open-ended with most of the lead questions being generated from a previously compiled check list (Appendix E) covering objectives of the study. Follow-up questions were then generated from statements, comments, and observations made by participants during interviews. Field data were collected by keeping a daily record of personal observations and field notes and a complete audio cassette recording of interviews.
Long Interviews

Personal interviews using McCracken’s (1990) guidelines for the long interview were conducted for all the five target groups. These interviews obtained the participants’ perceptions on the factors that account for poor links in the system, communication methods that presently work, communication and linkage mechanisms that have failed and why, and suggestions as to how the research-education-extension-farmer linkage could be improved.

The long qualitative interview gives the researcher the opportunity to "step into the mind of the individual being interviewed, to see and experience the world as they do themselves" (McCracken, 1990, p. 9). It "allows the respondents to tell their own story in their own terms" (McCracken, 1990, p. 34).

The interviews consisted of two parts. Part one dealt with questions on background information on the respondents. Part two consisted of a series of open-ended questions that address communication strategies and linkage problems within the R-E-E-F system. Table 3 shows the number of long interviews conducted and their distribution.

Data Analysis

The responses of both the long interviews and focus group interviews were transcribed and the transcripts were entered in a desk top computer. Some of the interviews had been
Table 3

Number of Long Interviews Conducted

<table>
<thead>
<tr>
<th>Province</th>
<th>Researchers</th>
<th>Lecturers</th>
<th>TTA</th>
<th>Farmers</th>
<th>Admin.</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Center</td>
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<td>-</td>
<td>3</td>
<td>.2</td>
<td>9</td>
<td>18</td>
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<td>-</td>
<td>1</td>
<td>-</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>West</td>
<td>1</td>
<td>5</td>
<td>-</td>
<td>-</td>
<td>2</td>
<td>8</td>
</tr>
<tr>
<td>NW</td>
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<td>2</td>
<td>4</td>
<td>3</td>
<td>10</td>
</tr>
<tr>
<td>Ex N</td>
<td>-</td>
<td>-</td>
<td>2</td>
<td>-</td>
<td>4</td>
<td>6</td>
</tr>
<tr>
<td>Total</td>
<td>6</td>
<td>5</td>
<td>8</td>
<td>6</td>
<td>21</td>
<td>46</td>
</tr>
</tbody>
</table>
conducted in French, while others were conducted in the local or popular dialect of the respective villages. These had to be translated into English before being entered into the word processor. The process of open coding in grounded theory was used (Strauss & Corbin, 1990) to encode the data. This method utilizes an "analytic process by which concepts are identified and developed in terms of their properties" (Strauss & Corbin, 1990). Objectives were laid out on a spreadsheet and responses to the different questions were categorized accordingly. Further analysis was then carried out following techniques put forward by Strauss and Corbin (1990) and emerging themes developed. A qualitative or ethnographic summary that involved quotations from the group and individual discussions was also used. These two methods complemented each other. The ethnographic approach benefited from systematic grouping and tallying of key subcategories, or topics, while the qualitative summary of the data was improved by including quotes that demonstrated the points being made (Morgan, 1990, p. 64).
CHAPTER 4
CONTEXT WITHIN WHICH R-E-E-F LINKAGES TAKE PLACE

This chapter answers objective number 1: To describe the context in which the R-E-E-F linkage exists.

In developing countries, historical and contemporary factors led to the establishment of agricultural research institutions oriented toward an international market and an international professional audience. There is a gap between research and technology transfer institutions, and an ever wider breach exists between technology transfer institutions and the majority of agricultural producers in developing countries. (Sims & Leonard, 1990, p. 69)

Cameroon is no exception to this scenario. Its checkered historical evolution encouraged the separate development of the various units concerned with agricultural education, technology generation, and technology transfer. The different philosophical orientations of these units are reflected in either their organizational structure or their objectives and approaches to achieving these objectives.

This section will briefly describe the history of Cameroon, the demography, and the physical and economic setting. This will be followed by a look at the evolution of the R-E-E-F linkage in Cameroon and the organizational structures of the Institute of Agronomic Research, the University Center of Dschang, and the various extension organizations involved in the study.
Historical Background

Cameroon is usually described by the tourist officials as a "microcosm of Africa" or an "Africa in miniature." It is a small dynamic country approximately 474,926 sq km (183,569 sq mi) fitted at the bend where the west coast of Africa turns south. Cameroon is bordered by the Republic of Nigeria to the west; the Republic of Chad to the north; the Central African Republic to the east; and the Republics of Congo, Gabon, and Equatorial Guinea to the south (Figure 1).

Cameroon was a German protectorate in the late 19th and early 20th centuries. After being occupied by the British and French forces at the end of the First World War, the country was partitioned between Britain and France in 1922 by the League of Nations. These mandates were subsequently converted in 1946 into United Nations Trust Territories.

Cameroon was the third African state south of the Sahara to regain independence, following Ghana and Guinea. It preceded other French-ruled territories because it was a United Nations Trust Territory whose independence had been hastened (like Togo) by the United Nations. The "République du Cameroun" born on January 1, 1960 was the former French Trust Territory. On October 1, 1961, British Southern Cameroons joined it to form the Federal Republic of Cameroon, so that for most of the 33 years since January 1,
Figure 1. The Continent of Africa.

Note. From Primary Geography for Cameroon (p. 89) by J. A. Ngwa, 1985, Hong Kong: Longman Group, Ltd.
1960, Cameroon has been the only African nation to be composed of ex-French and ex-British territories.

**Demography**

The population of Cameroon is approximately 11.5 million (1987 census) of which 71% live in rural areas and 29% in towns and cities (Delancey, 1989). There is an extremely heterogeneous ethnic mosaic as different cultural classifications show several African cultures south of the Sahara represented in Cameroon (Herskovits, 1962; Murdock, 1959). Over 230 languages are spoken in the country (Brenton & Dieu, 1980) and there is great movement among the different peoples from one region to another. There is religious freedom and as a result 19% of the population are Moslems (mostly the northern half), 66% Christian, and almost 10% are of traditional African religions (Ngwa, 1985).

**Physical Features**

There is a wide range of agroecological zones in the country: Coastal lowlands, southern Cameroon continental land, Western highland, Adamaua, and North Cameroon (Figure 2). The territory expands from lovely sand beaches and thick equatorial forests in the south through mountains and grassy hills and plateaus to a dry savanna in the north near Lake Chad with heights between 300 m above sea level to as
Figure 2. Agroecological zones in the country.
high as 4,070 m (Mt. Cameroon) above sea level. It has a vast volcanic range, parts of which are still active.

Temperature range from 67.1° F to 83.3° F (Ngwa, 1985). Two main winds blow across the country. Between October and March the North West wind which originates from the Sahara desert ushers in the "Dry season." This wind is known throughout the entire west coast of Africa as the Harmattan. It is strongest in the North producing very hot days and very cold nights while low areas have hot days and hot nights. Between March and October, strong southwesterly winds blowing from across the Atlantic ocean bring with them "the Rainy season." Annual rainfall varies from 70 cm in the North to 1000 cm in the South West. As a matter of fact, Debuncha, a small town in The Fako Division of the South West Province of Cameroon, records the second heaviest rainfall in the world with 1000 cm per year.

Economy

The per capita gross domestic product (GDP) for Cameroon in 1988 was estimated at $960, 24.8% of which came from agriculture (World Bank, 1990). Agriculture plays a very prominent role in Cameroon’s economy even with rising crude oil production.

Whether this importance is measured by the percentage of people employed in farming and livestock, by the proportion of its contribution to the total gross domestic product, or by its significance as a source of export earnings, there can be no doubt of the key role
agriculture plays in this country. (Delancey, 1989, p. 125)

The importance of agriculture is confirmed by the following sectorial breakdown: 79% of the population is in the primary sector of the economy (i.e., agriculture, forestry, and animal husbandry); 7% in the secondary sector (industry and construction); and 14% in the tertiary sector (services, commerce and trade, transport and communication; Delancey, 1989).

Major exports include cocoa, coffee, timber, cotton, bananas, rubber, palm produce (oil and kernels), groundnuts (peanuts), hides and skins, pepper, crude oil, aluminum, bauxite, gold, tin, iron, and limestone (Ngwa, 1985). Some of the principal imports include clothing, building material, machinery-cars, lorries and their parts, road equipment, farm tools, electrical goods, some foods and drink (e.g., flour and spirits), fuels (petrol, diesel, and kerosene) lubricating oils, drugs and chemicals, books, and stationery (Ngwa, 1985).

**Evolution of the R-E-E-F Linkage**

Since independence, the linkages among research, education, and extension have been marked by a checkered history of integration, separation, and cooperation at different levels. Upon its inception at the time of independence, agronomic research was placed under the
auspices of the Department of Agriculture which was also responsible for agricultural extension in the country.

As a result of this integration, the Nkolbisson Agronomic Research center, the Barombi-Kang station, and the Bota and Ekona laboratories (all created in the colonial period and all operating in an isolated manner up until that point, when they were put together in the same department) fell under the control of the Agronomic Research Service of the Department of Agriculture. In 1967, the attributions of this Service were redefined and it was made responsible for the elaboration of agronomic research programs, analysis of research findings, and preparation of extension programs based on those findings. The agronomic research services was also charged with overseeing the French institutes specialized in tropical agriculture which were operating in Cameroon in the framework of specific accords signed with the Government of Cameroon. However, at the federal level these institutes were under the supervision of the Ministry of Planning and Development (Tchala, 1985, p. 7).

In 1974, a National Scientific and Technical Research Board (Office National de la Recherche Scientifique et Technique—ONAREST) was established. ONAREST later became the General Delegation for Scientific and Technical Research (Délégation Général de la Recherche Scientifique et Technique—DGRST) in 1979. This meant "the centralization
of decision-making and budgeting regarding all scientific and technical research in Cameroon" (Tchala, 1985, p. 7). Creation of this body took agronomic research services out of the Department of Agriculture, so causing a separation between research and extension activities.

The next phase of linkages between research and extension came with the creation of research antennas attached to a number of agricultural projects across the country. Collaboration between the research staff and extension services within the domains of the respective antennas was encouraged. More recently, IRA has forged cooperation with extension services through its specialized units called the Testing and Liaison Units (TLU) whose role among other things has been to develop links between research and extension services.

Until 1982, research's linkage with agricultural education was limited to the "utilization of certain individual researchers as guest lecturers giving courses in domains where the institute lacked sufficiently qualified personnel" (Tchala, 1985, p. 8). In 1982 an accord between the university institutions and DGSRT expanded these links to take more advantage of the "human, financial and material resources placed at the disposal of the agencies involved in research and higher education" (Tchala, 1985, p. 8).
Since 1982, several efforts have been made to improve the linkages among research, education, and extension services in the country. However, these attempts have not been sustained. On April 13, 1984, Decree No. 84/158 (Tchala, 1985) reorganized the Ministry of Higher Education and Scientific Research. This decree put the University Center of Dschang and the Institute of Agronomic Research in the same ministry. But in the six years that followed, no significant changes in the linkages that existed between these two have been documented. In 1992, another decree was signed creating a Ministry of Scientific Research. This decree put Agronomic Research from the Ministry of Higher Education and Computer Services into the Ministry of Scientific Research. Presently the status of the R-E-E-F institution stands thus: agronomic research is under the auspices of the Ministry of Scientific Research, The University Center of Dschang (UCD, agricultural education) is under the auspices of Ministry of Higher Education, and Extension Services is under the auspices of The Ministry of Agriculture. As one looks at the structures of some of these institutions one still sees a recognition of the need for linkage and communications. This is evident in the composition of the board of administration of some of these institutions. However, these efforts do not go far enough. For example, the UCD has a representative on the board of
administration of IRA. However a representative from IRA is conspicuously absent on the board of administrators of the UCD.

The Institute for Agronomic Research (IRA)

Agricultural research in Cameroon today is for the most part carried out by the Institute of Agronomic Research (IRA). The IRA mission is to design and implement basic and applied research programs in all disciplines in agronomy and forestry, with the aim of improving agricultural and forestry production.

Objectives

In view of its mission, IRA has the following mandate:

1. To ensure a permanent link with all national sectors of agronomy and forestry.

2. To reinforce the link with users of research results in order to identify their research needs, address these needs, and disseminate research results.

3. To ensure the improvement and management of food and cash crops production.

4. To conduct research aimed at improving the use of forest and medicinal plants.

5. To survey and study botanical species.

6. To develop food technology in relation with other research institutions, universities and economic agents with the objective of adding value to the national production.

7. To study production and genetic resource conservation systems.

8. To ensure a wide dissemination of research results that are likely to be used by economic agents, in
conjunction with the media and relevant services or institutions.

9. To intensify the training of researchers, "cadres," and technicians necessary to meet its needs and the needs of national and international sectors.

10. To ensure the production, multiplication and certification of foundation seeds to be used by economic agents. (Presidency of the Republic of Cameroon, 1991)

Structure

IRA organizes its research through a network of research centers that in turn control research stations and antennas (satellite stations) located in all the agroecological zones of the country. The Institute of Agronomic Research operates under the auspices of the Ministry of Science and Technology. Appendix F shows the administrative structure of the Institute.

The University Center of Dschang (UCD)

The 1990-1991 General Catalogue provides adequate and up-to-date information on the profile, structure, and mandate of the University Center of Dschang (UCD). The writer will, therefore, rely on this publication for documentation concerning the UCD.

The UCD is the primary institution that provides higher level training in the field of agriculture. Established in April 1977, UCD was initially placed under the auspices of the Ministry of National Education. Presently the institution is under the auspices of the Ministry of Higher
Education Computer Services and Scientific Research (MESIRES).

At the onset, instructional programs at the UCD were at three levels:

1. The "Ingenieurs de Conception" of ENSA
2. The "Ingenieurs de Travaux" of ITA
3. The "Technicien d'Agriculture" of ITA

The National Advanced School of Agriculture (ENSA) provided instruction for the "Ingenieurs de Conception" option. This degree program included the "Ingenieur Agronome" and the "Ingenieur des Eaux, Forêts et Chasses."

The Institute of Agricultural Technology (ITA) trained officers for immediate practical work in the field and granted the "Ingenieur de Travaux Agricoles" and the "Technicien d'Agriculture" diplomas.

In 1989 a four-year Bachelor of Science degree in Agriculture ("Ingenieur de Techniques") with five options, and postgraduate programs replaced the ENSA and ITA academic cycles. In addition to these new programs, the National Institute for Rural Development (INADER) continues to operate and offers a two-year Agricultural Technician diploma ("Techniciens d'Agriculture").

The UCD has nine academic departments or "disciplines" which represent the various teaching, research, and extension areas of the University (Appendix G).
majority of the country's agricultural research and extension personnel are trained at the UCD. Among other functions, the University's mandate includes research, outreach, and rural education.

The Research Mission

The UCD research mission is to develop applied, adaptive, and basic research programs that generate appropriate technology to provide viable support to its teaching and outreach functions with the ultimate objective of increasing agricultural production and productivity through:

1. Emphasis on research that solves immediate problems of farmers and others in the private and public agricultural sector at the local, national, and international level.

2. Development and adaptation of research methodology and technologies, giving due consideration to preservation of the environment.

3. Participation in the formation and working within the framework of coordinated national research planning committees.

4. Development of the infrastructure for research and laboratories, farms, and other analytical facilities.

5. Working with clients to identify problems and carrying out appropriate research to solve these problems.

6. Insuring uninterrupted funding of research through creation of endowment funds, soliciting research funding through grants, and carrying out research on a contract basis.
7. Collaborating with other research bodies in multi-disciplinary research teams to identify and solve the problems of farmers.

8. Development of methodologies for and carrying out on-farm and location-specific research in order to have a better conception of the farmers' conditions.

9. Reporting and disseminating of research results in publications such as journals, fact sheets, and extension bulletins.

10. Training and working with research assistants to support faculty research programs.


The Outreach Mission

The outreach mission of UCD is to respond to the training, technical information, and technical support service needs of all its clients involved in activities directly or indirectly related to agriculture through:

1. Training of extension personnel and other clients,
2. Organizing seminars, workshops and conferences,
3. Assisting in demonstrations, and
4. Providing expert services to the private, public, and international levels. (General Catalogue, UCD, 1990-1991, p. 15)

Rural Education

The mission of the Department of Rural Education is to make available the findings from various areas of agriculture to potential clients. To accomplish this mission the Department will:
1. Set up and run in the areas of agricultural extension and rural sociology, teaching programs primarily based on national and African specificities.

2. Carry out research programs in close collaboration with other departments in order to find appropriate solutions to problems of rural areas.

3. Disseminate research results and popularize new technologies in the agricultural and related sectors of the economy. (General Catalogue, UCD, 1990-1991, p. 22)

The Extension Service

The extension service is the oldest service established by the colonial administration that involved the rural masses in some way. During this colonial period, extension’s function was primarily regulatory rather than educational. Its objective was basically to guide, encourage, and regulate production of export (cash) crops for the benefit of the colonial administration with little or no attention paid to food crops. Emphasis was placed on producing raw materials for the British and French industries hence the concentration on the production of coffee, cocoa, bananas, rubber, and oil palm.

Over the years, the goals and functioning of the extension service have changed to fit and complement the country’s evolution and goals. However, because of the diversity in the country’s colonial heritage, cultural, educational, and agroecological setting mentioned earlier,
different types of extension approaches have developed in the country.

**The National Extension and Training Project (NETP)**

The National Extension and Training Project (NETP) is financed by the World Bank. This project was first launched as a pilot project in July 1988. This pilot phase was established in the Eastern Province, the Extreme North Province, the Northwest Province, and the South Province. In 1991 the project went into full operation. This operational phase covered the following provinces: Adamaoua, East, Extreme North, Littoral, West, and Southwest provinces.

**Objectives**

The short term objectives the NETP are to:

1. Reinforce the competence of the extension services, development agencies, and all institutions involved in agricultural extension.

2. Upgrade the level of performance of extension personnel.

3. Enhance the agency’s information system, its capacity to monitor and evaluate.  
   (Ministry of Agriculture, undated-a, p. 2)

The long term objective of the NETP is to improve agricultural productivity through the design and implementation of a harmonized extension system adapted to the regional and local conditions. To achieve this objective, the NETP has adopted the Training and Visit approach to extension. The following actions are being implemented:
1. To transform the extension service into a more dynamic and flexible professional service that is more responsive to farmers' needs.

2. To improve extension agents training by strengthening their communication skills, and their technical and management capacities.

3. To promote a wider participation of farmers, women, and youths in the rural development process.

4. To ensure the transfer of new and well-adapted technologies by reinforcing the link between researchers, extension agents, and farmers.

5. To develop and fine-tune the information and communication system in the agricultural sector.

6. To provide more logistic such as transportation means, training material, demonstration tools to rural development agents.

7. To clearly define the role, duties and responsibilities of parastatals, development agents, MINAGRI and MINEPIA extension service to avoid overlaps. (Ministry of Agriculture, Undated-a, pp. 2-3).

**Organizational Structure**

The organization is patterned after the existing traditional extension system. However, new names were adopted in order to generate a new working spirit among the people involved (coordinator, supervisor, subject-matter specialist, village extension worker). Appendix H shows the structure of the NETP and how it fits into the Ministry of Agriculture.
North West Development Authority (Mission de Développement de la Province du Nord Ouest-MIDENO)

The operations and program implementation of the North West Extension system is strengthened and supported by the North West Development Authority. The North West Development Authority (Mission de Développement de la Province du Nord Ouest-MIDENO), is an integrated rural development institution that was created in the North West Province. This institution was created on the August 13, 1981 by Presidential Decree No. 81/350 (Ministry of Agriculture, Undated-b).

Objectives

Upon inception, the main aim of MIDENO was to improve the living standard of the population of the North West Province. To achieve this goal MIDENO had the following key objectives:

1. To raise farm family incomes.
2. To improve income distribution.
3. To increase food crop production.
4. To improve access to and from markets.
5. To increase foreign exchange reserves by raising the level and quality of export crops, particularly coffee. (MINAGRI, undated-b, pp. 2-3)

The MIDENO achieves these objectives by providing its services through the Provincial Delegation of Agriculture (PDA), thus eliminating the dual system that exists in other
areas of the country. Here the extension and training component of MIDENO is linked to adaptive research. "Under this system, links between Extension and Research are strengthened through the Adaptive Research programs of the Trial and Demonstration Centers (TDCs) where packages of extension recommendations are defined for dissemination to farmers" (Mbonchom, 1990, p. 2).

**Objectives of the Extension and Training Component**

The objectives of the extension and training component were defined in relation to the five key objectives of the MIDENO project:

1. To train existing Demonstrators, and to recruit and train sufficient additional staff to obtain a ratio of approximately one Village Extension Worker (VEW) to 600/800 farmers.

2. To recruit and train additional Extension Supervisors to supplement existing Chiefs of Agricultural Posts (CAPs) who will also be trained to implement the new extension programs.

3. To mobilize and equip extension staff by providing transportation, tools, and equipment to VEWs to enable them work effectively in training farmers.

4. To strengthen extension-research links through the Adaptive Research program of the Trials and Demonstration Centers (TDCs) which defines packages of extension recommendations for improving crop production for farmers in the different ecological zones of the Province. The TDCs also provided monthly training facilities for extension staff in those recommendations being communicated to farmers.

5. To motivate VEWs and their Supervisors to provide an effective extension service for farmers. (Mbonchom, 1990, p. 3)
**Organization of MIDENO**

MIDENO's organizational structure consists basically of:

1. A Supervisory Authority. This is the Minister of Agriculture. He is responsible for the general policy and overall performance of MIDENO.

2. A Board of Directors. It comprises eleven members including a chairman who is the Governor of the N.W Province. It has very wide powers for the administration and management of MIDENO. It is responsible for policy-making and for all MIDENO actions.

3. A Management. Which is made up of staff placed under the authority of a Manager and Deputy Manager. The functions of management can be summed up to be:
   - Personnel management
   - Program management
   - Budget management

The management is answerable to the Board of Directors and the supervisory authority. (Ministry of Agriculture, undated-b, pp. 2, 5)

**Société de Développement du Coton (SODECOTON)**

On May 10, 1974, Presidential Decree No. 74/457 created the Société de Développement du Coton. This integrated rural development agency replaced a French cotton company, CFDT. SODECOTON's activities cover the Extreme North and North provinces.

The objective of SODECOTON is to promote specifically the production of cotton and global development within the cotton production zone. This objective is achieved by ensuring:

- Technical assistance to farmers.
- Providing the necessary production inputs and off-setting the corresponding costs.

- The sale and transformation of cotton seed.

- Marketing of cotton in the local and external markets.

- To transfer cotton seed and groundnut into oil in order to improve their value added.

- All agricultural, industrial, commercial, real estate, or financial operation directly or indirectly related to the above mentioned objectives.
  (SODECOTON, undated, p. 1)

Organizational Structure

The SODECOTON is placed under the auspices of the Ministry of Commerce. SODECOTON carries out its activities using a modified Training and Visit (T & V) system. A simplified organizational structure is as follows:

1 - Directorate

2 - General Secretariat

3 - Five Technical Divisions

   - Rural Development Division
   - Industrial Management Division
   - Works Division
   - Finance and Accounting Division
   - Commercial Division

Summary

In this chapter, secondary data were examined in order to describe the context in which the R-E-E-F linkage exists. The literature revealed that the linkages among research, education, and extension have been marked by a checkered
history of integration, separation, and cooperation at different levels. It also revealed that limited attempts have been made to encourage linkages within the R-E-E-F system by having only a few institutions represented on the board of administrators of other institutions within the system. The organizational structures of the respective institutions involved in the study were also described.
CHAPTER 5
OTHER RESULTS

This chapter summarizes the results of the study in relation to objectives 2 and 3. It does so by discussing the different themes that evolved during analysis in relation to the objectives, conceptual framework and related literature. Objective number 1 which called for a description of the context in which R-E-E-F linkages take place was covered in detail in chapter 4.

Characteristics of Informants

A total of 207 professionals from five institutions concerned with the R-E-E-F system took part in this study, while a total of 168 farmers were interviewed. The average age of the researchers was 43 years. Their highest level of education was a Doctor of Philosophy degree while the lowest level of education was a Bachelor of Science degree or its equivalent.

The average age of the extension workers was 39 years. All the agents had either diplomas or certificates of agriculture from a two-year college of agriculture or an agricultural training center or a lower cycle of the UCD.

The average age of the lecturers from the UCD who took part in this study was 43 years. Their highest level of education was a Doctor of Philosophy degree while the least
educated lecturer had a Master of Science degree or its equivalent.

The administrators surveyed had an average age of 43 years with the lowest educated one being a Bachelor of Science degree holder or its equivalent. The highest educated administrator had a Doctor of Philosophy degree or its equivalent.

The average age of female farmers in the study was 40 while that of the men was 50. Fifty percent of all the farmers had been through primary school.

Field Observations

Even though the main source of data collection was by recording interviews (both focus group and long interviews), with an audio recorder, intensive field notes were made in a field journal. Striking observations, noted during interviews and observations of every meeting, were summarized at the end of the sessions. In two interviews with the university lecturers, and two with the administrators, breaking the ice was a bit difficult. However, as we talked (in all four cases), the informants gradually relaxed and talked a little more openly. In two of these cases it was necessary to go back to the first few questions to try and get them to talk a little more on them. Generally, participants were quite open and cooperative and they spoke frankly. Group interaction was very good and
most participants exhibited cordial attitudes towards each other. At the end of the interviews participants mentioned that these discussions had forced them to do some self-evaluation. It made them stop and think of certain aspects of their daily relationships they had either taken for granted or not stopped to think about. At the end of group discussion, some participants said it gave them an opportunity to hear and share what colleagues felt about certain issues. The most exciting sessions were those with extension agents which often seemed to end like therapy sessions with participants feeling better. At each of these meetings, a member of the respective TLU, who was supposed to be a guide to the different locations was present. The agents at each location somehow felt this was an opportunity to let researchers know exactly where they thought the problem lay as these types of occasions were rare.

**Emerging Themes**

The following themes emerged during analysis:

1. The need to forge formal links within the R-E-E-F system.

2. The need to create a coordinating committee.

3. The need for participatory planning and collaboration from the design stage.

4. The need to institutionalize the Testing and Liaison Units (TLU).

5. The need for a more "transparent" administration.

6. The need to share resources.
7. The need to reduce bureaucratic red tape.

8. The need to change the attitudes of professional staff towards each other within the R-E-E-F system.

9. The need to change the attitudes of the population through education.

10. The need to improve the morale of agents.

11. The need for in-country scientific publications.

12. The need to publish extension bulletins and by whom.

13. The need for an increase in the proportion of female professionals in the R-E-E-F system and in their role in the communication process.

**The Need to Forge Formal Links**

**Within the R-E-E-F System**

In broad terms, linkage mechanisms could be defined to include: regular events, concrete procedures, arrangements, and channels through which gaps between components of a system are bridged (Rolings, 1990). This bridge allows communications between the different components of the system. The study showed that although there were several ways through which researchers, extension agents, educators, and farmers contacted each other, a significant number of these have developed from personal efforts. In some cases these personal contacts were so highly developed that they were a foregone conclusion. Some of the participants found it difficult to draw the line where informal stops and
formal begins. In describing some of the contacts with colleagues on station, one researcher said:

Most times it is informal, in the sense that it is not written on paper—no protocol. The director encourages collaboration but there is nothing written down which says so. We do it on personal relations.

Participants identified the following linkages as some examples of linkages that have occurred frequently and over a period of time so that they looked like formal linkages:

1. Seminars,
2. Joint surveys and on-farm trials with other research units and individual researchers on station,
3. Rapid appraisal surveys,
4. Joint planning meetings,
5. Workshops,
6. On-farm demonstration plots,
7. Training of extension agents,
8. Resource sharing, and
9. UCD students spending time at the different research stations and extension institutions, as part of their training.

In listing some of the above mentioned linkages, a researcher in a focus group remarked:

These are forums which researchers have to share experiences and learn from each other. These are informal contacts but they have been done so often that they rather look like formal links. But, I say this is informal because there is no official document, or protocol making this legal.
As earlier indicated, many of the links identified were as a result of individuals or specific units making special efforts to forge these linkages. These were individual efforts made by various researchers to keep in contact with colleagues who in most cases were former schoolmates or acquaintances. Examples of such contacts which brought about these informal linkages included:

1. Exchange ideas during meetings and conferences.

2. Have direct consultations with other researchers which might in some cases lead to a joint trial e.g., (a) invite an entomologist to assess suspected pest problems on the field or in storage, (b) invite a breeder on the field or during field days to see how particular varieties were faring, and (c) establish contacts with other groups of researchers either as individuals or as a unit as the need arises on specific problems.

3. Have two units work together for mutual interest or to avoid duplication e.g., joint agroforestry trials between TLU and ICRAF. A researcher remarked:

We collaborate with other programs like ICRAF in order to avoid duplication. We tap into their expertise and do it together, jointly rather than spreading around. We may spread in different directions but always the trials are geared towards the same objectives. This is all informal arrangement--person to person or unit to unit.
4. Share documents on a personal basis.
5. Host occasional visits from extension subject-
matter specialists who are responsible at their
level for training village level agents.

In reporting similar experiences another researcher noted,
"These collaborations are informal and could be initiated by
either side depending on whose interest is served most."

The relationship between agents from the different
extension agencies was found to be less encouraging. In
general, the agents could not identify any formal links that
existed between the agents of Ministry of Agriculture
extension service and any of the parastatals in the
different zones in question. "Contacts with them are very
informal. They have their trials to follow up and their
farmers too and we have ours. They also travel around the
area visiting farmers. We meet, we discuss." A second
agent continued, "It depends on personal relationships. I
get invited to their meetings which are held every three
months. But it is not the same all over and might change if
some other agent is posted to my area. I also provide them
with figures when they compile their reports." While
describing how they try to reach farmers in remote areas
another SODECOTON agent said:

Even in areas very isolated we either have a farmer
representative there or in the nearest village which is
unlike the MINAGRI. This is why we said that if there
was a formal collaboration then MINAGRI could take
advantage of these agents. Note however that informally we work together, we help each other.

An agent from the Center Province pointed out that:

There is no formal links between us and agents from SODECAO. But seeing that we all practically went to the same schools, we know each other. So when we meet we discuss with each other and share experiences on an informal basis.

The Need to Create a Coordinating Committee

As discussed in chapter 4, IRA, the UCD, and the extension services fall under different ministries. No formal channels were established through which staff of the respective ministries could communicate with each other. A number of participants strongly felt that a large part of the linkage problem within the system came from the fact that the different institutions concerned were located in different ministries. If the separation of institutions continued, participants felt that some kind of official coordination was necessary.

An administrator from the UCD pointed out that at different periods of the history of the R-E-E-F linkage some efforts had been made to keep the different institutions in contact with each other. These efforts had not, however, been quite successful. In looking at the evolution of the R-E-E-F linkage in Cameroon (discussed in objective 1 in chapter 4), one saw the attempts at linking research and extension in the physical location of the respective institutions and in the makeup of some of their board of
administrators. Until 1991, the UCD was represented on the board of administrators of IRA. The research services however were not represented on the board of administrators of the UCD.

Participants, however, believed that a creation of a coordinating body would serve to keep the different institutions in contact with each other. A researcher stated:

There should be a liaison body between research and extension--this body should take care of communications, decide how best results should be channeled, and inform people where to find them.

This body would consist of representative from the different institutions involved in the R-E-E-F mechanism.

Participants suggested the following as some functions that this body could undertake.

- Hold meetings in which representatives would update members of ongoing activities in their respective institutions.
- Act as a monitoring body to ensure that proposed activities were carried out.
- Publish once a year the types of research being carried out by the different institutions. In this way, people would know what kind of research was going on in other institutions and possible areas of collaboration.
The Need for Participatory Planning and Collaboration From the Design Stage

A key to getting staff from the different institutions interested and committed in joint projects and other collaborative endeavors is to make everyone concerned feel a part of the undertaking. This could be accomplished by getting all the people concerned with a project to contribute ideas during the design stage as well as other stages of the project as it progresses.

Informants pointed out that it was very necessary for representatives from the different institutions to collaborate with each other. "We serve the same clientele and it is important for us to speak the same language." Discussions with participants showed that in the collaboration that existed between staff of the different institutions, "people are not totally committed." This was so because colleagues within the respective institutions and staff from other institutions got involved in projects after they had been started. Because of this late involvement, they did not feel as part of these projects and therefore felt no obligation towards making the project succeed. One of the administrators noted:

We have to design research projects together instead of everyone designing their small project alone in their office and then inviting others to join at the end or trying to get funding and to implement it on their own. True there will always be the question of project leader but that could be determined by who will do the
most work, experience, or some other criteria that can be predetermined.

In emphasizing the need for everyone to be included in a collaborative effort from the onset, another administrator said:

An example of why projects run into problems is the establishment of the NETP project. When this project was formally approved we did not have any input, not even to have a copy of the project document. When they organized the national extension symposium, we were involved very late. Of course the consultant from the World Bank came here to talk to us but we were actually involved towards the end--at the seminars with no real input. I actually got the impression that things had been decided earlier. I remember that we were still discussing in some groups when we were called that the plenary session was going on, which means these other groups had no input in the supposed recommendations or memoranda. That was a very sad experience.

Another administrator pointed out some problems that could arise if everyone concerned was not involved in planning from the start. He stated:

There is one thing we should have done with a particular group which we have done with others. At the beginning of each year there should be a meeting between extension and us. Here we jointly develop a program for the year with certain aims and objectives. We then set up a calendar which fits our respective schedules. We can later meet from time to time and modify it if necessary. We failed to do this with one group. Hence they schedule seminars and workshops at times and places where our researchers cannot be present. We have to involve everyone from the beginning.

Participants pointed out that officials in the system should try to take advantage of the expertise found in the different institutions in all stages of a project.
Extension agents indicated they felt left out in important decisions with respect to the type of collaboration that should exist. Agents were not encouraged to take charge and make basic decisions or contribute to these decisions. They felt that their contribution was not valued. In the case of technology generation, extension agents felt that they were not included in the process of diagnosis and research design and when they were it was at a later stage. An agent remarked:

Researchers should spend more time with extension agents. They should not just send protocols and come to collect results later. We place these tests but we do not sit down with research to work out the exact problems and what could be done. We have the feeling that some of these problems go unnoticed.

Another agent added, "Yes, when researchers come to put in tests, they should ask us what farmers' needs are. Farmers have other needs other than just maize that researchers bring to us."

Another aspect concerning problems in collaboration was one which could be corrected in part with proper dialogue and education. Agents believed that their administrators made very few attempts to involve them and keep them abreast with collaborative agreements entered into with other institutions. One agent pointed this out as he said:

If there is formal collaboration, the bosses should take time and explain to us its terms and how it works. All we see is a note telling us we will be receiving planting materials and that is all. Whereas, if they have initiated a collaboration then it should be done
honestly at all levels. We should be involved because whichever way you look at it, the success of the project depends on us.

Emphasizing problems that occur as a result of not involving the appropriate parties concerned, another agent said:

Another problem concerns the maize seed material sold by Pioneer Agro Genetic. A lot of farmers bought these seeds. We do not know anything about it. The plants were seriously attacked by stem borers. Farmers came complaining to us. Yet it is the delegate who sent such a company to us. This is a good example of the type of collaboration we are talking about. All we get are instructions to work with these people without knowing the origin and details and yet we get to be blamed when things go wrong.

Researchers felt that presently the type of collaboration that occurred especially across institutions did not involve everyone concerned from the design stage. One of the members of a TLU felt that the TLU's own method of working with farmers also needed some modification. "When we evaluated our approach and method of diagnosis we realized that there is not enough farmer participation in the design and what themes are addressed by us."

**The Need to Institutionalize the Testing and Liaison Units (TLU)**

The Testing and Liaison Unit (TLU) is the on-farm testing component of IRA's National Cereals Research and Extension project. There are four TLUs operating in the country. The TLUs were identified as an important component of the R-E-E-F system. They were considered important partly because they carried out final testing of promising
technology on farmers' fields and brought feedback from farmers' fields and from the extension services. Participants also identified several other TLU activities that made this unit special within the system. The TLUs were the main link between a number of on-station researchers and the extension services and farmers. This link was made possible through workshops, seminars, and training for extension services and in some cases farmers and farmer groups.

Being a component of the NCRE project, TLU activities were limited to cover the mandate as determined by the terms of the project. There were calls however for TLU activities to be expanded. Researchers and extension agents felt that TLU activities in on-farm testing and extension liaison were important enough and should be increased to cover all the different crops that IRA worked on. In looking at activities in which their program was involved with the TLU, an on-station researcher noted, "However, so far the TLUs have concentrated only on maize. We work in an area where the farming system is multicropping, hence, the TLU should include all the various crops in their activities." Another researcher expressed these same thoughts as he explained, "The TLUs should be institutionalized as a farming systems program within IRA. They should be extended to other programs and stations wherever research and extension are
carried out." Still on the same subject another researcher stated:

Collaboration within the institute will be greatly enhanced if the concept of the TLUs is institutionalized within IRA. TLUs can also take the leadership in organizing the contact between researchers and farmers. Presently, there is not much coordination within the institute on direction of contact with farmers. This makes farmers confused. If everything is channeled through the TLU with coordinators in each of the units coming to this body, I think it will enhance coordination.

An administrator further expanded on the type of image he would like a new expanded TLU to assume by saying:

Make sure the TLUs become more important. Establish a TLU in every center. Have them interact with all commodity programs. At the end of the year, the most recent research results and technology from the stations should filtrate through the TLUs to be tested on-farm. This will go a long way into making research results available to farmers. TLUs on-farm experience and testing should then get results in a state ready for use. As a matter of fact this can then be turned over to the unit in charge of publishing extension bulletin which could be attached to the TLU.

The UCD was not left out in calls for an increase in the activities of the TLUs. Informants felt that UCD contacts with the TLUs would greatly enhance research-UCD-farmer linkage. One lecturer said, "I would like to see a formal relationship between the UCD/rural development and the on-farm adaptive unit (TLU) of IRA." Explaining a little more, another lecturer stated:

If a team like the TLU had more contacts with the university, this will benefit the university more because this can then be used as a teaching aspect where students will be exposed to farmer circumstances.
Members of the TLUs confirmed the potential role that an expanded unit could play in the society. They, however, pointed out that the present structure and numerical composition of the different TLU units were too small to provide maximum services. Further, they emphasized that for the efforts of the TLUs to be maximized, there needed to be better marketing opportunities. These opportunities would include seed production units, availability of other inputs that the new technologies were recommending (e.g., fertilizers), and an improved market and postharvest structure to handle anticipated production increases.

**The Need for a More "Transparent" Administration**

Participants called for administrations that were more transparent, open to dialogue, and more in tune with field conditions. The present administrations of most of the institutions involved in the R-E-E-F system were designed after that of the Cameroon public service. Administrators of extension services, research, and the UCD, as well as most of the staff of these institutions, were hired by the public service. Administrators of the other three parastatals, the SODECAO, the SODECOTON, and the MIDENO were direct hire but still worked in a framework similar to that of the public service.

It was noted that a number of these administrators had risen through the ranks of their respective institutions and
therefore had experience on the field. However, another portion of administrators came directly from the public service and so lacked field experience. This was made clear by an IRA administrator who said:

Administraion in IRA has been designed or is a copy of the central administration. Most of these officers are not properly trained on the problems and needs of research. They do not care, or they are not aware of the actual function of research. They feel they are here just to manage cars. This group needs serious training on the objectives of the institution and the role they play in it.

Informants from all the institutions involved in the study reported that they communicated their problems and results through a variety of ways that included personal contact; letters; and fortnightly, monthly, quarterly, or annual reports. These reports or problems were channeled upwards to the directors through their local or immediate supervisors. Participants, however, identified several gaps in their communication with their administrators. These gaps affected the information flow, first, within the institutions and then, across institutions.

Informants felt that administrators tended to be cut off from the realities of what actually took place on the field and felt that more field visits should be made by the administrators. Agents felt that because administrators did not acquaint themselves more with actual field conditions they could not properly assess an agent's workload. This made them allocate unrealistic assignments to agents. Some
agents actually proposed a reduction of the agent/farmer ratio. An agent showed how the work load of agents could be underestimated as he explained:

I think collaboration should start from the top. For instance my chief, the Divisional delegate, does not know what is happening on the field. Therefore, collaboration has to come from the top for him to even know the intensity of work we have to do on the field so he could take decisions based on that. Because when the researcher contacts us directly on the field, after papers are signed, he may think we are here just to joke. If he sees the actual work, he can then be able to understand how busy the work schedule he allocates is.

Researchers on their part felt that administrators would understand better the urgency and promptness needed when requests were made for field materials if they made more visits to the field. They pointed out that even though a number of the administrators were either part-time researchers, or had been researchers themselves, present administrative pressures and their absence on the field have made them lose sight of certain field priorities and procedure. "They should come more often to the field and not just on special visits, evaluations, and so on."

Informants, including some administrators pointed out that periodic refresher courses for administrators were necessary. Participants felt that these courses would update administrators on their roles as facilitators and on changing field conditions. Participants felt that it was
necessary for administrators to keep a small percentage of their time as researchers when they said:

They must always have about 15% of their time doing research. This will keep them up-to-date with current practices and literature in their field of expertise. Without this they start having an arbitrary look at what people are doing and they become redundant. Some of the implications here however may be that evaluation promotion criteria for this group may have to be revised to take into account both types of duties performed.

Participants emphasized the need to have a "more transparent administration." A key to getting staff more interested and committed in their work was making them feel a part of the establishment. These sentiments were expressed earlier in participants' call for participatory collaboration. Here they stressed the need for the administration not only to keep staff informed of problems facing the institutions but also to involve them in the decision-making process. These views were shared by informants from the different institutions and also by some of their administrators. This was summed up by an administrator when he said:

Each time there is a line or process which is being set up, whether restructuring or changes in policy, the administration has to group researchers and explain to them. I'll give you an example. The performance contract: we should have called the researchers and explained to them that there is no money and that the government was asking us to write a performance contract. These are the reasons, this is how we intend to tackle it. Then ask for suggestions, have input from researchers. You cannot have only a small group of people decide the fate of everyone. These people are those going to work under the conditions that this
contract is calling for and you may even get better collaboration from them if you involve them in the process.

Another example is the budget and its allocation. It should be explained to them. This way they can better understand when their research projects are turned down. I'm sure if we explain to researchers like that they will understand and there will be a better work atmosphere between themselves and between they and the administration.

Similar sentiments were expressed by informants from the other institutions.

The Need to Share Resources

One of the problems that all the institutions within the R-E-E-F system currently faced was the lack of adequate resources to effectively carry out their missions. Informants from all the participating institutions pointed out that along with proper education, formal collaboration and other solutions which they might identify, learning to share the resources that existed within the system was a must. Agents in the Center Province blamed the lack of collaboration in the systems on the fact that some agencies did not have adequate resources. "We need to look at why there is lack of collaboration. It is because some agencies have more resources than others and try to undermine others. So if every agency had enough resources things will be a bit better." Some informants pointed out that presently some were being shared but things could be better.

SODECOTON agents felt that having formal links with MINAGRI will help the system. This would create an
opportunity for resources to be shared there by putting the farmer at an advantage. An agent from SODECOTON made this point when he said:

We have a little more contact with farmers than MINAGRI agents. This is because we have more men on the field and more resources at our disposal. Their agents come to us sometimes (unofficially) when they need help. Formal links will help these agents.

Another agent added:

Personally, I think we should try and somehow forge a common program. If there are demonstrations and trials to be done these could be done together, jointly instead of competing. Presently, both sides try to show that their system is better than the other's. What we should try to avoid is trying to discredit each other like what happens now. This puts the farmer in a state of confusion not being able to decide whose advise to take.

Another area which participants felt was affected by lack of resource sharing was that of training. Participants pointed out that a careful inventory of human resources in the system would unquestionably reveal that IRA, UCD, and MINAGRI had enough resource people to handle most of the training needed to maintain desirable standards within the system. This training would include refresher courses and seminars for researchers, agents, lecturers, and farmers. Agents then went on to say that lack of proper coordination had led to some of these resources not being effectively used. One said:

Now we have some of our agents being sent abroad for these courses yet we have an establishment like the UCD that could organize seminars and refresher courses for us. This does not mean that our agency does not give
us refresher courses or information but I think the UCD is a resource that should be exploited.

Participants felt that part of the solution was to:

Identify what we have in common: people, equipment, material, and so on. Create dialogue. Have meetings to examine what both institutions are doing and where possible solutions may arise and where we can collaborate. We already have the Biotechnology section of the faculty of science who have already identified themselves for possible collaboration especially in the tissue culture area. IRA tissue culture labs are located at Ekona and Njombe.

Researchers from the tissue culture lab at IRA Ekona echoed this in saying that "more should be done to encourage researchers from the university to come and use the labs and other facilities. Also more joint ventures need to be encouraged."

Other researchers, and a couple of their administrators, saw increasing opportunities for sharing resources between IRA and the UCD as a way of reducing duplication, and freeing up funds for other projects. Examples given included carrying out complementary research and involving lecturers in research activities; and encouraging more researchers to give lectures at the university either as one time lectures, or as part of a course. From the UCD, some participants felt that more researchers from IRA and IRZ should be encouraged to lecture, at least part time. They also noted that joint teams within the university used to stand better chances when soliciting research funds. This practice of forming
joint teams had faded out but they thought that if researchers and lecturers worked together they would stand a better chance of getting donors to fund their research endeavors.

Other informants from the UCD pointed out the importance of their having joint research, meetings, and collaboration with adaptive research team and especially extension workers. A lecturer made this point as he stated:

We cannot improve our program without knowing exactly how those on the field are performing, and what their strengths and weakness are. If we know what they lack, what they did not get from the university, that will help us shape our program. But we need to know from them their shortcomings.

**The Need to Reduce Bureaucratic Red Tape**

Delays in the system were blamed for a number of communication breakdowns and inefficiency in information flow in the system. For information or a document to go from one ministry to another, it would have to pass through several hands and offices before reaching its destination. "There are too many bottlenecks in the system, too much red tape. It makes things difficult." Similar complaints were heard from informants at the UCD, IRA, and the different extension agencies. An administrator explained:

Government policy in Cameroon just like most African countries is too rigid. For example, if I had to send a note on extension work here to someone in research to act on, it must be signed by my minister and my minister can only address it to the other minister. By the time this information gets to whoever has to take action it may be quite a while. You see, officially, I
have no right to go and see the director of agricultural research. I would be going against government policy. We need to cut down some of this red tape. Directors should be able to discuss farmers' interest with other directors, extension workers, and research personnel working in the same area and these individuals should be able to work directly with each other. Agents should have the freedom to move to the research station in the areas they work and discuss with researchers. But as it is now, the extension personnel are not allowed to visit the research station—officially—even within the same locality. We need to break off this high level red tape—you allow the people to communicate. This is why they should be under the same ministry. It will make communication easier. Even if left under the different ministries they should be able to do this. True, some conflicts will arise. You realize presently with the personnel every-body wants to protect their turf. Nobody wants to be interfered with.

Because of this rigidity in the sequence of contact in the hierarchy, communicating whatever results are available also became a casualty to this system. A researcher from one of the TLUs explained:

We have no formal links with extension—not even with the delegate in the zone you work. He is responsible to the provincial delegate who in turn is responsible to the minister. This is too long a route for information to travel. By the time it gets to its final destination people are no longer interested as the season may be over, or there would have been a deformation of the information due to the chain.

Along these lines, some extension agents pointed out that it would be better if researchers explained the objectives of their trials and protocols directly to them. Present practice sometimes required researchers to leave protocols and information about trials with extension supervisors and administrators who in turn explained them to agents. Agents charged that sometimes they had additional
questions and occasionally the supervisors could not provide full answers to them. This lead to improper implementation of trials and subsequent failure which got blamed on the agents. Secondly, agents felt that results of these trials should be communicated directly to them even if copies were sent to their delegates.

Agents also maintained that because of a delay in administering certain equipment and functions, their work suffered. Agents in some areas pointed out that even though they had transportation it sometimes took several weeks and sometimes months before allowances for fuel and maintenance were made available to them. This made it difficult for these agents to keep up with the number of farmers they had to contact.

At the UCD, lecturers pointed out that bureaucratic red tape sometimes slowed down communications even within the University. A lecturer explained:

If you have to wait on the administration for announcements of seminars, deadlines may expire. It sometimes takes three weeks or more for a letter to get from the administration to the department. In other cases administration is very slow at taking decisions. For example, if seminars are announced and people are interested, it takes time for them to appoint people or decide on who will go and sometimes by the time they do it is late.

The informants were then asked what they would do to reduce the bureaucratic red tape in the system. Almost invariably the first response was decentralization.
As we said in the beginning, we need to establish formal links. This way administrators in the provinces and local government areas will be able to follow the guidelines of the agreements and can make decisions without having to go back to the minister.

Others pointed out that with proper briefing on their respective roles and where they fit in the collaboration, certain functions and decisions could be left to regional and local administrators.

The Need to Change the Attitudes of the Professional Staff

Towards Each Other Within the R-E-E-F System

In talking to the respondents, it was evident that there were problems with inadequate information and misinformation which accounted for a lot of the communication breakdown, mistrust, and system inefficiency. The different institutions did not understand fully what the others were doing. If they did understand, it was haphazard and, therefore, lead to contempt, mistrust, and lack of cooperation. There was evidence of a lot of individualism in the system, as could be seen in this statement from a lecturer at the UCD.

As a lecturer, I am evaluated solely on research and the number of publications I make. This means that if I do a joint project with a researcher I most likely will prefer to be reported as first author for the work and publications. This is usually not possible. So in most cases we lecturers will prefer working individually.

Researchers indicated that within the research setting and even within the same station, they often worked in isolation. "We do not know what others are doing. There is
a lot of lack of information. Hence, it is possible that help or input from colleagues is overlooked." Informants pointed out that the system was characterized by small groups or units working most times in isolation from the rest of the system or with insufficient knowledge of what others were doing. "People get integrated into social groups and that destroys all kinds of possibilities of collaboration with other colleagues. This breeds mistrust."

Another level of this problem deals with misinformation or insufficient information. Respondents pointed out that when decision were taken they were not kept informed of follow-ups or had only rumors and half truths to work with.

Agents from SODECOTON explained:

It had been planned that there would be collaboration between the SODECOTON and the Ministry of Agriculture's NETP. They envisaged joint meetings such that whichever of the agents visits a village or particular farmer or groups of farmers they will try to solve whatever problems arose. The farmers see us as agronomist, and expect us to be versatile in all areas of agriculture. For example, the growing of onions, or other irrigated crops are generally managed by Ministry of Agriculture extension agents. We do not work with those crops. We are usually uneasy and sometimes at a loss when farmers ask us questions in these areas. These meetings or seminars were to give us enough information to be able to help these farmers. Just like the MINAGRI agents do not engage much in cotton. It was envisioned that if we both had joint meetings and seminars we would learn enough to be able to help farmers.

Another agent continued:

Yes, this has not worked, partly because of some misunderstanding. Yet, no one has bothered to explain to us what is really happening. But curiously enough
some agents thought that by training MINAGRI agents in cotton production, they will replace the SODECOTON structures already in place. In some areas this idea even affected the goodwill and informal relations that existed. I think that some education is needed. Our agents should know that what MINAGRI agents do is complementary to what we do. Without this collaboration all we do is confuse the farmers.

Another area of misinformation was agent’s and the public’s perception of research and the role research played. They felt research could provide know-how as well as equipment and other production related materials. A researcher stated:

As we work in the fields and meet and talk to people, there are a lot of them who ask what research really does. People do not know the function of research and this even goes for some officials of the different agencies. For example, for those of us in entomology, we find ourselves in an awkward position. When new products come out, our job is to test these products for effectiveness and safety and if necessary come out with modified application rates and doses that would be applicable to specific locations. Our job is definitely not to recommend any particular brands or to make them available in the local markets. After the agencies get our results they go and buy from whichever manufacturers they feel like. These may be expensive. But our role is not to tell SODECOTON or any other agency to buy cheaper products. Yet we get blamed either for not making the products available or when available for being too expensive. We present the results from different products to SODECOTON, it is now left for the management to decide which name brand to go with. Some of them tell us well you tell us it is best but it is also the most expensive. This even makes them feel that research is not necessary. Education is necessary for all branches to know what is going on.

Some agents and most of the farmers did not know what branch of research they dealt with. All they knew was that they came from the research station. Some agents had problems
defining who researchers were and so tended to undermine the very group of on-farm adaptive researchers (TLU) they worked so closely with. A good example is an agent who said:

There is usually a farmers’ field day for a particular technology. That day the TLU researchers come and we do what we call result demonstration for their trial plots. But unfortunately, there are very few zones that the researchers go themselves. Not even researchers--the few who come are only the people of the TLU. The real researchers themselves do not even come to the field to see the conditions.

Next there seemed to be poor communications between the agents and researchers on some of the objectives and rationale for the collaborative trials they were implementing. Further, agents felt that even when follow-up was done and after the relevant forms, questionnaires, and other instruments were collected by researchers, they did not get feedback, at least not directly. If the findings from these trials resulted in extension recommendations, for example, agents did not quite understand this. This was evident when an agent said:

Part of the problem is that we do not know what researchers do with most of the information they get when we fill out forms that accompany the trials. We do not know if they use them or if they just file them. This is discouraging.

Echoing these sentiments another agent added, "There is no feedback from researchers on the different tests and trials that we carry out with them. All we do is fill out forms."

In continuing to describe areas of misinformation in the system, researchers on their part pointed out that it
was not their place to provide extension agents with remuneration, transportation, and other facilities. First, researchers said they did not have the budget and, second they felt that the work was a collaborative effort, with extension services, and researchers and extension agents serving the same clients. "Getting agents to be committed in the collaboration has always been the problem. They see working with researchers as doing them a favor." Another researcher stated:

Here in our area, part of the problem we face with extension is getting agents to understand that we are working for a common clientele. This is because they see it as though collaborating with us means doing a special favour for researchers. Hence the feeling that they have to be compensated for whatever work done with us.

Another researcher added, "This lack of commitment may be understandable since they do not have it written in their annual or daily work plans that this collaboration is part of their work."

Education, most of the respondents pointed out, was the key to solving this problem. It was absolutely necessary for the different institutions to spend time educating first their entire staff, then personnel from other institutions with whom they collaborated, and next the public in general on their respective roles. A lecturer pointed out:

Education is necessary. More communication will help other branches understand better the structures and functions of each other. This will eliminate mistrust
and apprehensiveness that exist between the different groups.

Participants felt that this education should take place at
different levels of the R-E-E-F system. With adequate
education people within the R-E-E-F system and the society
as a whole would change their attitudes towards the way they
perceived each other's role and contribution. This they
hoped would create an atmosphere that was conducive to
information flow, commitment to work, and maximum
collaboration.

The Need to Change the Attitudes of the
Population Through Education

Participants indicated that the public in general did
not have enough information on "the goals, potential,
capacities, and services" offered by the different
institutions in the R-E-E-F system. Farmers had to know the
different resources available to them in order to be able to
take advantage of these resources. Farmers had to be made
to understand that these services were there to help them
and not to take advantage of them.

Farmers needed to be educated on how research and
extension work and the fact that there was no profit
making on the part of research and extension hence no
need for farmers to get paid. The advantage is theirs.

Lecturers and administrators at the UCD also expressed
concern over the fact that a good percentage of the
population was not aware of the type of research carried out
by that institution. They also felt it was imperative that
people be exposed to some of these facts. Like all the other informants in this study, the lecturers felt that education would be the key to solving this problem.

Informants saw education being accomplished through seminars, workshops, news releases on radio and TV, local organizations, and the school system. "Give farmers lots of training sessions to get them interested and motivated because some people (farmers), until they have an opportunity to get involved in something, always stay away." Course content of these information packages, they felt, should include material geared towards changing people's attitudes with regards to certain practices. "Farmers should also appreciate that as well as produce for their own consumption, they can produce for money such as a high yielding variety could be produced solely for the market." A lecturer pointed out that "education in schools will change attitudes towards job choices. We should also teach students about the different branches of agriculture and agriculture related jobs and how these jobs relate to one another." Yet another one suggested, "We have to involve secondary school teachers in some of the work we do as we cannot propose to change the secondary curriculum without involving them."

Another area that respondents thought the society as a whole needed more education on, was women and the role they
played in the R-E-E-F system. The respondents felt that educating more of them would put more women in positions to influence their role in the system. A researcher expressed these sentiments when he commented:

If more of the females going to school are directed into nontraditional courses for women i.e., into the courses of sciences and agriculture, this then puts them in a position to say we are the majority of the clients in the ministry, what should we do to help our own kind?

Others felt that in the process of education everyone will hopefully learn to appreciate womens' roles in the system.

This was summed by a researcher when she said:

Yes, we need to get more women channeled and educated into these areas. However, I think it is also possible for men to think like women, as long as extension officers who are presently in the system can understand that women and men approach their different areas of agriculture differently. They also need to know that they may have different problems and that we need to communicate to both not just to men. Then I think we do not have to wait till we get more women into the system. But there are ways that we could improve things with our present system. But only if we all begin to recognize that women and men don't look at farming in the same way, their problems are not the same, their needs and farming methods may not be the same.

The Need to Improve the Morale of Agents

Extension was the primary link to farmers. As an agent said earlier the success of an extension related project depended a great deal on extension agents and their input. Informants who recognized this fact pointed out that if one had an unhappy extension service working in poor conditions
the possibility of not having an efficient system would be increased.

Agents especially from the Ministry of Agriculture had very low morale. They pointed out that they were not working under particularly optimum conditions. Agents had to cover large areas on foot and some of those who had motor bikes did not have fuel for them. Agents also indicated that they needed boots and raincoats. Some said living conditions at their posts were uncomfortable. Extension agents from the parastatals confirmed this as one of them said:

"They should provide them with means and compensation. When we say compensation we do not necessarily mean money or individual bonuses. We mean things like transportation. We have our bikes and can cover a wide territory."

An administrator with the NETP in the Extreme North said:

Presently we have a delay in the payment of the maintenance expenses of the motorcycles. This delay is up to three to four months. When the motorcycles break down because expenses are not paid, this means that the program as a whole is disturbed. Even the two week calendar cannot be fulfilled. If this is the case, the extension agent loses his grip on the work to be done, because he has a daily calendar of appointments to meet. Whenever he cannot use his bike because he does not have funds to keep up with the maintenance, the whole program is disturbed, and this may have serious impact at the end of the campaign.

Other agents felt that some research practices had an effect on agent's attitudes towards their collaborative endeavors.

Not all agents had the opportunity of working with
researchers. The current practice was that only some agents within an area were selected to participate in trials and other work with researchers. Some of those selected tended to feel that they got more work than others and should be compensated for this supplementary work. Some agents on the other hand, felt that by not having an opportunity of working directly with researchers on these trials they were being denied the opportunity of being exposed to first-hand knowledge and hands-on practice.

Other informants felt that agents would be more effective if the agent-farmer ratio was reduced. Given the conditions under which they worked, long distances to cover usually on foot, poor roads, and little support equipment, it would help if the number of farmers within the agent’s area were reduced. Some researchers in the Extreme North noted:

You need an extension service that is motivated. If you have someone who is motivated because there is money, because they are being paid, because they are mobile and so can get to visit all their farmers, then all you have to worry about is how best to get the message across.

The other part of the morale problem, some researchers felt, stemmed from the fact that a good number of agents got into the profession only because they had nowhere else to go. "Instead of attributing it to class differences" another participant explained:
We see low morale more of a problem than class as a problem. A lot of the agents get into extension not out of choice but as a last resort. Hence, there is no commitment. The few who get into it because they want to, and those who have grown to love it and adapt to it are committed and are not as affected by this morale problem even though working and living conditions are far from being ideal.

**The Need for In-country Scientific Publications**

One of the ways through which research results were shared and communicated both within the R-E-E-F system and to scientists outside the country was through scientific publications. These publications were viewed as necessary if the system was to have credibility. Some participants also felt that encouraging publications and, where possible, joint publications, would greatly reduce duplication. However, the opportunities for researchers and lecturers of publishing within the country were very limited. Participants stressed that scientific publications within the R-E-E-F system were a must, for several other reasons besides reducing duplication. These reasons included:

1. The fact that promotion of researchers and university lecturers depended a great deal on the number of scientific publications attributed to an individual. Yet there were very few opportunities for these groups to publish their results in-country. This was so because official journals of the IRA and the UCD had not been published for several years. Making this point further, a lecturer from the UCD said, "The
university is supposed to have published a journal. Unfortunately, however, the first issue came out but the second issue has been in press for over three years now."

2. Even though a number of workshops and seminars were being held in the country, several people did not have access to them. Another lecturer elaborated, "Do not get me wrong. Seminars are good, but if you have to touch more people that is not the way. Publications will definitely do a better job."

3. Participants identified scientific journals as forums through which knowledge was shared. They, therefore, felt that the national and international scientific community ought to be invited to participate in these publications. "Open subscription to the outside and be open to criticisms. This means encouraging more people to write papers as opposed to having one person write four articles in one journal publication."

4. Participants felt that by encouraging local publications, scientists would work on problems that would benefit local farmers. This was summarized by an administrator who said:

   There are very few forums for African and even worse for Cameroonian scientists to publish. Hence, they have to look abroad to publish and to do this successfully they have to work on themes that these
journals are interested in which may not necessarily be what will benefit our farmers.

The Need to Publish Extension Bulletins and by Whom

After attending seminars, workshops, field days, and agent-farmer meetings, the one thing that stayed within the system as permanent reference documents was extension bulletins. Through extension bulletins, researchers communicated their results to the farmers. As facilitators, staff of the extension services used extension bulletins as a very valuable tool in the implementation of their work. Yet in talking to participants of this study they all pointed out that the area with the biggest flaw in the system was the availability of extension bulletins.

Participants explained that most of what was currently available consisted of scientific reports from the research services. Some agents noted however that these reports where highly technical and needed to be written in a language that could easily be used by the extension services. Most of the agents noted that they seldom got access to these documents even though researchers were supposed to have been sending copies to the department of extension services and the Ministry of Agriculture. As a matter of fact an administrator from the Ministry of Agriculture pointed out that occasionally they received some of these reports. Unfortunately upon receipt of these documents they were filed in cabinets and in a lot of cases
not used. "Presently, we have some but since I came they are just sitting in one glass cupboard locked under key and decorating the place." He continued to point out that the other half of this problem was that research services also failed to forward most of these documents and that because of lack of official contact between the two ministries not much follow-up had been done.

Farmers were asked to suggest ways which the extension services could better reach them. Seven out of nine focus groups suggested bulletins. They pointed out that if the bulletins were written in simple enough language accompanied by illustrations, they would get their children presently in schools and other members of their working groups who could read to explain the content to the rest of the group. Subsequent questions would then be directed to agents when they came by. A couple of administrators also noted that the new agricultural policy called for civil servants nearing retirement who planned to get into farming when they retired to be posted (upon request) as close as possible to their villages or where they planned to retire. The aim of this was so they could begin establishing their farms before they retired. If this policy worked as envisioned, the level of education of those in agriculture would be raised tremendously. This new breed of farmers, the administrator hoped, could then serve as facilitators in the community
they lived in and the extension bulletins would then be a very important tool.

Participants felt that the issue was not whether extension bulletins were needed but how and who should handle their production. They saw these concerns as being crucial especially as formal contacts between the services concerned were virtually nonexistent. Most participants envisioned joint efforts for such an undertaking to be successful. Participants felt that a joint initiative for the publication of bulletins would make use of expertise and resources from the different agencies within the R-E-E-F system. From the university a lecturer said:

Make extension bulletin a joint publication between IRA/TLU and the UCD/rural development because our colleagues in IRA work more closely with the farmers than we do. We may have the writing skill and more time than they would and so we may edit more easily. We need also to have input from extension and maybe some farmers--for feedback.

From the extension services an administrator said:

Production of extension bulletins should be a joint action between researchers and extension personnel. This suits us better. We are hoping that this will soon be implemented since there now exists a convention with IRA under the World Bank project (NETP) to write booklets on their findings in a form acceptable to farmers.

Similar calls for the need for publishing research results to be a joint effort were made by researchers. As one researcher in a focus group put it:

Writing beyond annual reports is a skill which researchers may not have. A place like IRA should have
communication specialists who will work in conjunction with representatives from extension and the university. This unit will help the research people recast these reports into a language or form that the ordinary person or the extension person can use.

Participants suggested a unit be created with representatives from IRA/TLU, the UCD and extension services. An administrator explained:

This unit will weed through results which have been obtained, and identify the new technology that would eventually be transmitted by the extension services. They should be able to develop technical hand-outs that describe the process of carrying out a particular operation in details with diagrams and illustrations and a calendar of planting operations. These results should now be put in language which farmers can understand.

Also identified as other avenues of transmission that this unit would use are press releases in both print and news media.

The Need for an Increase in the Proportion of Female Professionals in the R-E-E-F System and in Their Role in the Communication Process

Women contributed over 60% of the agriculture labor force in Cameroon. Yet the number of women in research, education, and the extension services was very low. Out of a total of 207 professional participants in this survey, only 8 females were interviewed: 1 administrator, 5 extension agents, and 2 researchers. This ratio of males to females was not far from what actually existed in the system. The importance and significance of the role that women played varied with location. Even though some
informants said that there was no difference between male and female extension agents in certain parts of the country, most of the participants still felt that an increase in the role of women would greatly enhance communication linkages in the system as a whole. Informants attributed the lack of female staff in the system to cultural leanings and traditional orientation in schools and the society in general. All the participants, however, agreed that the degree to which this gap in the ratio of female to male staff in the system affected communication linkages varied from region to region. They suggested a combination of steps to improve the women’s role within the R-E-E-F system.

The first problem identified was that there were very few professional women within the system. One of the informants in the survey was a technical assistant who had joined the research service not too long ago. In examining the role that women played within the R-E-E-F system he stated:

In talking to some other researchers on my way home the other day, I found out that the ratio of female researchers to male researchers in IRA is not more than 10%. And if that is the situation, then you see that the gap there already exists between researchers and farmers. If a greater percentage of farmers are women and you have only men always looking at male problems, or at problems from a male perspective, there will always be a gap in the system.

Another researcher within this group posed the following questions that needed to be considered:
Are we taking into account the fact that a large percentage of farmers are women? Does this mean that we need to change the ratio of women and men in research and extension? How do we look at the situation from a female farmer's point of view as well as a man's? Let's just make sure that somewhere in the R-E-E-F linkage we remember that a large percentage of the farmers are women.

These questions confirmed points made earlier by another researcher. This person felt that while waiting for long-term solutions of increasing the involvement of females, a change in the system could come about only if officials recognized that women and men looked at farming differently and so had different needs and problems. Another group of researchers from the Center Province pointed out that having female staff on the different research or extension teams would make a big difference in the kind and level of communication between research, extension, and especially female farmers. In a follow-up question, this group of researchers were asked if it would make a difference if the composition of research teams were different. One of the researchers in this group replied, "Yes, women on the teams make a difference. We started with no female staff. But when one female member joined the team, the farmers opened up to us as opposed to when she was not there." The need for more female involvement in research and extension teams was echoed by yet another researcher, this time from the Extreme North Province.

We see a problem because we do not have females on our team. The way the society in which we work is that the
women do not mix with the men. When we visit the villages, they stay apart and we speak only with the men. If we had a female colleague we foresee her working in direct contact with these women. Now as it stands, very few women farmers benefit from extension services because extension agents hesitate to work with women farmers here in the North. One of the ways to solve this problem will be to include women on research teams and extension teams.

These female team members the researcher added:

Act as facilitators in the group. To the extent possible, we should encourage females in agriculture occupations. Not only will it facilitate extension of results of farmers, it will make the atmosphere more congenial and people tend to open up more under these conditions.

The next problem was farmer preference as to the gender of agents with whom they worked. Some of the female farmers indicated that they preferred working with female agents. Those in the South West and North West provinces who exhibited this preference had been exposed to both female and male agents. These farmers said that although the male agents mastered their work a little more, the females spent more time with them and had more patience working to see that they understood what they were trying to show them. This need for patience was confirmed by agents from the Center Province who said, "Women are reluctant to accept a change in the way they cultivate. They are slower and hang on to traditional customs. Therefore, one needs more time to get them to appreciate and adopt whatever changes are being put forward."
Another area, which participants pointed out could be a problem in linkage, was the type of technology being developed. If this technology did not take women into consideration then the adoption rate would be very low no matter how efficient the system might be. Traditional and cultural perceptions of the role that females should play in the R-E-E-F system were the next factors that influenced women's role in the communication linkage. Informants pointed out that even though the society had grown to see women handle over 60% of the labor force in agriculture, they still associated agriculture and related professions with men. In all the areas involved in the survey, farmers and other participants pointed out that culture played a big role in how agents and new technology were received. Extension agents in the Extreme North also saw culture as a dominant influence on communications within the R-E-E-F system. "But there is a big influence of the culture on whether the women will want to work with the men. But if it were another woman who came to them it would be easier and they would open up much more." Another agent added, "The problem now is that there is a forgone conclusion--we already assume that women cannot do the work or we doubt if they can do the work." Then the question was could they? And the agent continued, "Why not? After all, women work more on the field and spend more time in their farms than
men. It is not farmer monitoring that will be too much for a female staff to handle."

Researchers pointed out that traditional and cultural beliefs also affected the rate at which female farmers would adopt proposed technology. A researcher from the Center Province explained:

In agroforestry, traditional values are very important. To date, we have not seen any women come forward to participate in our trials. All the farmers who have volunteered to participate in agroforestry trials are males. Agroforestry is still considered as trees so they leave this to men. Basically agroforestry is crops. We want to improve the soils and so on and grow the same traditional food crops which women are interested in and hopefully in a year or two they may understand that. But traditional values play a big role.

After having identified some problems and constraints that hinder the smooth flow of information and technology to female farmers and feedback from them to extension agents and subsequently to researchers, participants were asked how these problems could be solved. They were asked how women's participation in research and extension could be increased and how the society's traditional and cultural beliefs could be modified just enough to accept women in nontraditional agriculture and related professions. The answer was overwhelmingly a change in people's attitudes which could be achieved only through direct education primarily through schools. They all felt that a change in the orientation of students in school would change the way they perceived the
type of professions in which women should engage. From the Center Province, researchers pointed out that to solve this problem, society would have to:

Go back to the secondary school level to stimulate interest in the female because at the university levels it may be too late. This is appropriate at secondary school level when they start choosing and thinking about courses and career options. Sensitizing and recruiting is very important at this stage. People have to change their minds on how they view agriculture and not view it just as a male profession.

On their part, researchers from the South West and North West provinces pointed out that through the curriculum one could precipitate a change in women’s attitudes towards agriculture and related professions. They also saw the need for a change in the attitudes of males within the society. "As more women go to school more are exposed to the fact that there are careers outside the mainstream ‘elite’ professions. Also career orientation is necessary at the level of the school at the age where they start choosing different subjects." Another participant said:

Education of men is also crucial. This is also a man’s problem even though it has always been assumed that the problem has been that women were not able to work with and understand technology being extended. It is a man’s problem as they have been skeptical about other men working with their spouses.

Finally, extension agents felt that some attitude change was also necessary at the university. They felt that more clarification on the role of research and the function
and operations of other institutions within the R-E-E-F
system would encourage more females to stay in the system.

While at school we had this preconceived idea that
SODECOTON works only on cotton which is a man's
activity. If students knew that they also are involved
with food crops it will change a lot of things. For
now women do not even apply there when job offers are
made.

The female farmers felt that apart from having a
preference as to the gender of agents working with them they
had other problems which made things difficult for them.
These included access to inputs and a choice of agencies to
work with. The following statements from female farmers
across the country summarize these problems, thus:

They come to show us how to cultivate new types of
maize and cassava. They also apply pesticides when
maize is attacked on the field. But they do not tell
us how we can get these things when we need them.
There is no place to buy them even if we have the
money.

Some of the new methods they show us are very good.
Like we see it is easier for us when they kill the
grass first with chemical. This way when we go to weed
later the grass is not too much. But we have no money
to buy this chemical and some of the women who have the
money cannot buy it because it is not there. If the
government can help us get credit or advance as they
used to give the men when they were working with
FONADER it will be nice.

Since we started working with the people from extension
and the people who come from IRA, we produce more. We
even have some food that we can sell. Only it is very
difficult for us to reach the market. Transportation
is difficult. When we have transportation, most times
the drivers charge us very high because the road is too
bad and when we get to the market we do not have a
place to stand and sell in the market. So most times
we sell to these "buy 'em sell 'em" who pass here.
Only when we do this we do not make much profit.
Many people come and talk to us about our work. Some tell us the same thing, others tell us something different from what the others said. So we do not know who to listen to.

Summary

A total of 375 participants were involved in this study. Two hundred and seven of them were professionals from the R-E-E-F institutions involved in the study, and 168 were farmers who collaborated with these respective institutions. Field observations showed that participants were open, cooperative, and spoke frankly. Group interaction was also observed to be very good and most participants exhibited a cordial attitude towards each other.

The study revealed that most of the linkages that existed within the R-E-E-F system were informal links. Through the themes that emerged during the analysis of interview information, participants identified specific areas that hindered effective communications within the R-E-E-F system. They went on to propose some ways through which these linkages could be enhanced. First, they recommended a common institutional framework for research and extension. Second, they recommended the establishment of functional links among the different institutions and individuals within the R-E-E-F system. Some of the themes that fall under functional links included:

- The need to create a coordinating committee.
- The need for participatory planning and collaboration from design stage.

- The need to institutionalize the Testing and Liaison Units (TLU).

- The need to share resources.

- The need to reduce bureaucratic red tape.

- The need to change the attitudes of professional staff towards each other within the R-E-E-F system.

- The need for in-country scientific publications.

- The need to publish extension bulletins and by whom.

- The need for participatory planning and collaboration from the design stage.

Several other themes that participants identified would, if addressed, enhance linkages within the R-E-E-F system. They include:

- The need to forge formal links within the R-E-E-F system.

- The need for a more "transparent" administration.

- The need to improve the morale of agents.

- The need to change the attitudes of the population through education.

- The need for an increase in the proportion of female professionals in the R-E-E-F system and in their role in the communication process.
CHAPTER 6

SUMMARY, DISCUSSION, IMPLICATIONS,
AND RECOMMENDATIONS FOR FURTHER RESEARCH

A summary of the study is presented in this chapter. This is followed by a discussion of the findings; implications for the research, education, extension, and farmers (R-E-E-F) system; and recommendations for further research.

Summary of the Study

The purpose of this study was to determine the linkages that exist among R-E-E-F and to propose ways of strengthening these linkages. To achieve this goal the following objectives provided the basis of this research:

1. To describe the context in which the R-E-E-F linkage exists.

2. To examine the ways that R-E-E-F functions including:
   - formal and informal linkages,
   - communication strategies,
   - feedback mechanisms, and
   - diffusion of technical information.

3. To determine how administrators view the research, technology-transfer, and farmer linkage.

Recently, the problems, challenges, and issues related to linking R-E-E-F in developing countries have been brought to the forefront. Even though agricultural systems are committed to agricultural development, many constraints exist that prevent these systems from functioning effectively. Among these constraints is that of R-E-E-F
linkage which is often weak and in some cases nonexistent. Structures in many developing countries concerned with agricultural problems (Cameroon inclusive) lack the communication and administrative links to effectively coordinate research, education, and extension.

During the last decade, there has evolved a strong concern for the achievement of better interaction among technical research scientists, extension agents, and farmers in order to promote more relevant and effective agricultural programs. The conceptual framework for this study therefore provided concrete bases on which practical solutions to these problems could be achieved in Cameroon. The study was based on the conceptual framework for studying the links between agricultural research and technology transfer in developing countries which was developed by Kaimowitz et al., 1990. This framework described "linkage mechanisms" in terms of the organizational procedures used to maintain research-technology transfer links and "contextual factors," i.e., all the factors that affect the use and relevance of linkage mechanisms.

This study sought to identify some of the factors that hinder effective linkage among organizations and individuals within the R-E-E-F system in Cameroon, and how these linkages may be improved. This was done by examining the perceptions of selected individuals within the R-E-E-F
system. It was hoped that findings from the study and insight into different communication strategies would provide policy makers and those within the R-E-E-F system as a whole with possible answers on how to strengthen linkages among the four parts of the R-E-E-F system.

Because of the exploratory nature of the study, and the complexity of the questions being examined, the qualitative methodology was the strongest approach to use in this research. Participants included researchers from the IRA, university lecturers from the UCD, extension agents from the Ministry of Agriculture and four other extension (rural development) organizations, administrators of all the institutions concerned, and farmers who work with these institutions. Data collection consisted of the focus group technique and the qualitative long interview. A total of 26 focus group interviews and 49 long interviews were conducted.

The following themes emerged during the analysis:

1. The need to forge formal links within the R-E-E-F system.
2. The need to create a coordinating committee.
3. The need for participatory planning and collaboration from the design stage.
4. The need to institutionalize the Testing and Liaison Units (TLU).
5. The need for a more "transparent" administration.
6. The need to share resources.
7. The need to reduce bureaucratic red tape.
8. The need to change the attitudes of professional staff towards each other within the R-E-E-F system.
9. The need to change the attitudes of the population through education.
10. The need to improve the morale of agents.
11. The need for in-country scientific publications.
12. The need to publish extension bulletins and by whom.
13. The need for an increase in the proportion of female professionals in the R-E-E-F system and in their role in the communication process.

Discussion of Results

Research systems that cannot transmit findings to the extension services and to the farmer make little practical contribution. Extension work that is not sustained by results obtained through research has little value and may even be detrimental. (ISNAR, cited in Arnon, 1989, p. 785)

For research results to contribute to extension services, and for extension services to be able to gain constant access to research results, an effective link must exist between the two institutions. Similarly, for research services to be able to collaborate with the university and get feedback from extension and farmers, and for the university to be able to gain access to feedback information, effective linkages must exist. There must be an effective two-way communication among the different institutions within the R-E-E-F system.

This section discusses the problems that hinder effective linkages within the R-E-E-F system identified by
participants in the study. The discussion is related to the objectives of the study.

**Context in Which the R-E-E-F Linkage Exists**

Linkages among research, education and extension have been marked by a checkered history of integration, separation, and cooperation. At the time this study was conducted, research, education, and extension were housed in separate ministries. Research was under the Ministry of Scientific Research, education (UCD) under the Ministry of Higher Education while extension was housed in the Ministry of Agriculture. These services have, for the most part, developed separately and so have had little or no built-in complementarities. The country's colonial evolution encouraged an extension service that was developed with several extension models to suit a variety of objectives. These extension methods include parastatals, traditional extension services, modified versions of the T & V system, and nongovernmental organizations (NGOs). The need for linkages within the R-E-E-F system must have been recognized as some attempt at linking the respective institutions could be seen in the composition of some of the boards of administration. Efforts to link these institutions do not go far enough as only some of the boards of administrators have representatives from other related sectors and institutions as members.
Formal and Informal Linkage

Participants listed seminars, workshops, program planning meetings, joint on-farm trials, collaborative surveys, and field days as some of the links through which the respective agencies contacted each other. Participants, however, noted that even though some of these activities looked like formal linkages, most of them were initiated through informal personal contacts. These informal contacts, over the years, had evolved to look like formal contacts. Informants stressed that in most of these seemingly formal cases no protocol or formal agreements existed between the different agencies. They called for formal links to be established as they felt this would strengthen the efforts already being made by individuals.

Formal linkages mentioned in the literature and conceptual framework include: committees, task forces, liaison departments and officers, subject-matter specialists, agricultural communications units, preextension units, research conducted by development agencies, farming systems programs, joint activities, publication, presentations and demonstrations, staff exchanges, interagency agreements, service provisions, joint plans, matrix management, shared supervisors, policy mandates, and meetings. Informal mechanisms on the other hand consist of communication and
exchange of resources without official sanction or through personal contacts.

Possible formal links recommended by participants, as seen through the themes that emerged from the study, could be categorized into two broad groups. In one of these categories, research and extension are placed under a common institutional framework and in the other the institutions remain separate but are linked by functional linkages.

**Common Institutional Framework**

Most of the professionals who participated in this study felt that research and extension should be put under the same umbrella. They felt this would improve contacts between researchers and extension agents, and reduce the time lag between research findings and their availability to the extension services. Proposing this option, however, assumes that all other factors were perfect e.g., researcher-agent relationship, adequate financing, and mutual respect of the directors of the different departments. It should be noted that a common institutional framework does not automatically mean effective linkage. A number of studies done in Latin America showed that having research and extension in a single administrative framework did not in itself ensure good collaboration between the two services (Howell, cited in Arnon, 1989). A study completed in Colombia showed that even though a single institute was
charged with the functions of research and extension "the
extension division in ICA continued to have no direct
contact with the research division and promulgated
indiscriminately the application of foreign methods
inappropriate to the realities of the country" (Trigo et
al., cited in Arnon, 1989, p. 790). Housing research and
extension in the same administrative framework reduces some
of the administrative red tape but, to be effective,
interministerial or interdepartmental channels need to be
built in to maintain communications among the different
divisions. These built in channels which Kaimowitz et al.
(1990) called "environmental factors" could include "the
availability of different communications channels, the
development of the necessary infrastructure and traditions
for farmers to make use of inputs and information produced
outside their communities" (p. 266).

Functional Linkages Among Research, Education, and Extension

If administrative policies do not favor a common
institutional framework for the institutions within the
R-E-E-F system, the other option proposed by the
participants is what Arnon (1989) categorized as a
functional linkage. This type of linkage integrates
interpersonal relationships and collaborative practices
among parties concerned. Kaimowitz (1987) pointed out that
in the long run linkage activities are performed by
individuals whose behavior is influenced by the type of training they receive, their experiences, and their incentives. These elements could be seen in some of the suggestions made by participants through a number of the themes that evolved in the study i.e., creation of a coordinating body, participatory planning and collaboration, sharing of available resources, proper education of individuals within the entire system on the importance of an effective linkage mechanism, an improvement on the morale of agents and other professional staff with appropriate incentives, and a reduction of the bureaucratic red tape. The government and institutions involved "can provide the training, the incentives, and the formal frameworks to initiate and foster these linkages, even when the two services operate in separate administrative units" (Arnon, 1989, p. 791). These recommendations of institutional and functional links align with Kaimowitz et al's. (1990) conceptual framework. This framework defined links and linkage mechanisms as being institutional and functional: - Institutional links relate to institutions and personnel that carry out activities that would result in the exchange of resources (e.g., information, money, labor, and materials) between institutions and personnel.
- Functional links relate to research and technology transfer activities whose main aim is that of bridging the gap between these two units.

**Communication Strategies**

Participants identified group and personal contacts as the primary form of communication that existed within the system. Very limited professional exchange took place by way of journal and research reports. Participants suggested a number of changes within the system that may improve communication strategies. These strategies included a renewed effort to make journals available for scientific publication, institutionalizing the TLUs, improved relationships with the respective administrative units, and a general effort to change people's attitude towards agriculture and its related professions.

Joint projects, committees, and the institutionalization of the TLUs were particularly recommended. It was felt that participants within a joint project tended to become more committed to the project if they were given the opportunity to contribute jointly in the planning and implementation of the project. If properly managed, the TLU allows members of the R-E-E-F system to participate in each other's activities. Members would each have the opportunity to learn about the problems of each other and adjust their practices to accommodate others.
They would contribute in solving problems that would arise. Results that would subsequently be released through this joint initiative, would receive more credibility in the eyes of all concerned. Lionberger and Gwin (1991) summarized this line of thought as they wrote that "joint adaptive testing of research output by researchers, extension workers, and farmers probably creates the ideal linkage" (p. 34).

**Feedback Mechanisms**

Firstly, feedback channels through which researchers found out farmers' problems were very limited. The TLUs served as the primary channel through which extension agents channeled feedback from farmers' fields to researchers. Unfortunately, as participants pointed out, the TLUs had been concentrating only on certain crops and technologies. This was so because of limited manpower and a limited research domain. Calls were therefore put forward for a more expanded TLU.

Secondly, with the formation of proposed formal links through establishing a coordinating committee, institutionalizing the TLUs, and improving interpersonal links, more feedback on farmer conditions would reach the research stations and the university centers. This was very necessary if the university lecturers were to maintain a curriculum that was relevant to the demands of the system.
and if researchers were to investigate problems that would be beneficial to farmers. Thirdly an increase in the number of professional women and the role they play within the system would greatly enhance communication with and feedback from farmers all over the country.

**Diffusion of Technical Information**

Diffusion of technical information occurred mostly on a one-on-one basis. Agents worked with farmers or farmer groups and most of the information passed on was by word of mouth. Participants, however, recommended the production of extension bulletins which would provide a permanent source of reference both for the extension services and the farmer. Until now illiteracy among the farmers has been a cover under which people within the system have hidden, using it as an excuse for not producing extension bulletins. Things are changing. More farmers are learning to read. Others are saying that their investment in sending their children to school is paying off by these children being there to help interpret documents for them. It is therefore time for government staff and institutions within the R-E-E-F system to recognize that extension bulletins have a prominent part to play in the effective R-E-E-F linkage. Participants further recommended that production of these bulletins be a joint effort among the main departments within the R-E-E-F system.
Administration's Perception of the R-E-E-F Linkage

Most of the administrators involved in this study rose up through the ranks of their respective institutions. These administrators therefore identified with most of the problems outlined by the rest of the informants. They agreed, however, that some of their colleagues, especially those who had not had field experience in their respective fields, needed some training in their roles as facilitators. It was also recommended that administrators should make frequent field visits in order to stay abreast with field activities.

Summary of Current R-E-E-F Linkage

Current practices identified by participants showed that limited communication linkages (most of which were informal) existed among the different institutions within the R-E-E-F system. Figure 3 is an illustration of the links that currently exist within this system. Contacts between the UCD and farmers is minimal. The only official contact that the UCD has with the extension services is that most of the agents get their basic training either from the main campus of the UCD, or from one of its affiliated campuses. Students used to be posted directly to the extension service upon completion of their diplomas.
Figure 3. Current organization showing linkages among the staff within the R-E-E-F institutions.

Note. Intensity of lines shows degree of interaction.
However, as pointed out by participating lecturers, a recent presidential decree stipulated that upon graduation students would no longer be guaranteed automatic employment with the extension services. This move might reduce further the UCD's contacts with the extension services. Limited contact also exists between the UCD and IRA. Most of what exists involves some students spending time at research stations to complete a practical training requirement. During this time, researchers and students' lecturers do not meet. Contact is made by the student.

There is slightly more informal contact between the TLUs and a limited number on extension agents and farmers with whom they collaborate on on-farm trials. The highest degree of contacts within the R-E-E-F system exists between extension agents and farmers.

**Proposed Model**

After examining the different themes and functional links suggested by participants, and after considering the factors discussed in the conceptual framework, literature review, and having taken into account linkages that currently exist, the following model is proposed as a major step toward bridging the gap among R-E-E-F institutions. Figure 4 is an illustration of the proposed model: Communication development in the R-E-E-F system showing interaction among the R-E-E-F institutions. This model
UCD/Extension/Research/Collaboration Feedback mechanism for UCD on teaching content

Coordinating Committee: Composition - Representative from research including on-station & adaptive research; Extension including parastatals & other development agencies (NGOs inclusive); Must include at least 1 administrator from each institution

UCD

Extension + NGO + Other

UCD/Research collaboration

Research

Farmers

Extension/Contact farmers

Extension/Research subject-matter specialist

On farm adaptive research (TLU)
Farming systems research

Figure 4. Proposed model: Communications development in the R-E-E-F system showing linkages and interaction among staff within the R-E-E-F Institutions.
consists of a joint (technical advisory) coordinating committee and subunits through which members of the different institutions interact. The coordinating committee is seen where all the four components of R-E-E-F interact which represents the common elements that are found in all the circles. The subunits are represented where various combinations of the different circles overlap. This model should be used at the regional level as well as the national level.

Members of the national and regional coordinating committees should include representatives from research, extension, education, and farmers. Representation of extension should include personnel from departments of the different ministries that participate in development work related to agriculture, e.g., community development agents and agents from the ministry of social and women affairs. Also included in the representation of extension are staff members from the traditional extension services, the NETP, the related parastatals, and NGOs that carry out agricultural related services. A minimum of two representatives from each component of the R-E-E-F system would be required with at least one of these representatives being an administrator. Having an administrator as one of the representatives of an institution ensures participation
of both management and staff in goal setting and coordination of the activities within the system.

The regional committees would carry out diagnosis of farmers' conditions in the different regions. These committees would also be responsible to compile lists of development agencies, educational institutions, and research bodies that carry out agricultural related activities in the respective regions. These lists of institutions would also include the missions of the agencies involved and resources available to them. The national committee could then use the information provided by the regional teams as the basis for setting priorities and coordination of activities within the R-E-E-F system. Participatory planning and the joint setting of priorities and program of activities would encourage collective responsiveness of individuals within the R-E-E-F system to farmers' needs. Some duties of this committee could include:

- Coordinating of the respective institutional goals to the farmers' advantage,
- Monitoring proposed activities and their implementation,
- Acquainting members with ongoing activities undertaken by individuals from the respective institution,
- Working with the publication unit, and
- Encouraging forums for scientific exchange and sharing.
It should be noted that, whichever option is selected, a common institutional framework or functional links, a deliberate effort has to be made to keep communication channel among the different components within the R-E-E-F system open.

Additional Implications of the Study

1. Participants saw education and schools as a means through which peoples' attitudes and beliefs towards agricultural related jobs could be changed or modified. As a response to this call, agricultural education should be introduced in primary and secondary schools. Presently the system has advanced schools of agriculture which award diplomas in agriculture and a specialized school (The University Center of Dschang) which awards diplomas and degrees in agriculture. Yet there is a void in the lower school system. While traveling around the country carrying out interviews for this study, this researcher talked to a number of primary and secondary school principals about on their curriculum and the type of subjects taught. Some indicated they taught agriculture in schools which they called "Travaux Manuel" or Manual Labor. Others mentioned that agriculture was taught as a nonexaminable subject.

An administrator at the Ministry of Agriculture who took part in this study, like a number of the other participants, stressed that it was time the government
considered introducing agriculture in schools. The aim would not be to prepare the students for the job market but to provide them with enough base knowledge to appreciate the different options available in the field of agriculture and how these different services interrelated with one another and with the society as a whole. This step he said would go a long way in changing society's attitudes towards professions in the field of agriculture.

2. The concerns of multiple agencies bombarding the farmer must be addressed. The government needs to examine in detail the role of the different development agencies and where they fit in the R-E-E-F system. This should include the different NGOs as well as paragovernment agencies engaged in development activities. The examination would have to consider efforts that need to be undertaken to harmonize their different roles in the system. Participants concluded that joint teams were beneficial to the farmer and were a better use of resources.

3. Joint research and research that is entirely relevant to the farmers' needs should be encouraged. To accomplish this, the university and the research institute need to reassess their evaluation and promotion procedures. At the UCD, lecturers pointed out that they were evaluated solely on their research and publications. This meant that there was not enough commitment to the students and their
lectures. Secondly, subjects chosen for research were selected basically for their appeal to publish. This did not leave any incentive for joint projects with researchers on efforts that might be difficult to publish. Similar concern is expressed by researchers from the research institute. If linkage along these lines were to be encouraged, a reexamination of evaluation and promotion procedures at these institutions is a must.

One of the informants summarized participants' call for a change in IRA's policies on publication thus:

IRA should rethink its policy on publications. IRA thinks that they should be the first journal in which you should try publishing. As long as IRA's journal is not being published on a regular basis it becomes difficult for us. They can authorize us to publish in other journals. We find it easier if we have joint papers with an expatriate staff to publish in a foreign journal. This therefore discourages collaboration between national scientists.

Other researchers pointed out that if IRA retained its publication criteria for advancement, then all positions should be defined in such a way that people are called to do activities that will allow them to publish. Some examples could include the following:
- Administrators with research and administrative duties should have enough time and support field staff to carry out research so that they could publish.
- On-farm agronomists should have a substantial amount of time and resources for on-station trials so that they could publish.

- Economists should have enough time and resources for multiple visit data generation so that they could have the data they need to publish.

4. Inputs must be made available to farmers when new technology is introduced. Introducing new technology without making available all the necessary inputs defeats the purpose of the whole exercise. Without adequate inputs, any attempts to evaluate the adoption rates of new technology that makes use of these inputs would be inaccurate. Policies should therefore encourage the establishment of businesses and institutions to address these concerns (e.g., seed multiplication).

5. The administration should make special efforts to encourage more women to work in agriculture and related services. It should also make special efforts at getting women into leadership positions.

6. The structure of IRA must be reexamined. The aim of this would be to survey how communication linkages between the various programs and units could be enhanced. The institutionalization of TLUs was also a necessary change to consider.
7. Decisions must be followed up after they have been implemented. Participants cited a number of projects and decisions that were initiated but never completed. Many resources could be saved if the administration took time to follow-up these projects. Participants, therefore, stressed that the administration had to be committed if these changes and any other undertakings were to succeed.

Recommendations for Further Research

1. This study identified that female farmers in certain regions exhibited a preference in the gender of agents they would prefer to work with. Also identified was an impact in the presence of female professionals on extension and research teams. The extent to which the role of female professionals impacted on the system varied from region to region. Given the fact that the present study is not based on a random sample from which statistical inferences can be drawn, a quantitative study could be carried out with a larger representative sample of regional and national population to validate these farmer preferences. The research could be duplicated in the different regions of the country.

2. The study recommended the creation of a coordinating committee. For this body to effectively coordinate the activities within the R-E-E-F system it would need a detailed documentation of resources of the agencies within
the system to include: technical skills, human resources, and equipment. A detailed study classifying all the different institutions involved and their resources could be undertaken.

3. The findings of this study show that farmers in certain regions are being exposed to several developmental agencies but in a disorganized manner that disadvantages them instead of helping them. Further study could be done on categorizing the NGOs regionally and nationally with an attempt to identify resources available to these institutions. Such a study should also examine the role that NGOs play within the R-E-E-F linkage in order to assess how the activities of these NGOs could be coordinated along with other institutions within the R-E-E-F system to provide an effective service to farmers.
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APPENDICES
APPENDIX A

Sample of letter of introduction.
The Sub-Delegate of Agriculture,
Kumba Central Sub-Division.

Subject: PhD AGRICULTURAL EXTENSION/EDUCATION RESEARCH STUDENT VISIT

Mrs. Lambert Ako Enyong of the Faculty of Education, Virginia Polytechnic Institute and State University U.S.A. is presently in the country carrying out her research on "Linkages Among Research, Education, Extension and Farmers in the Republic of Cameroon". She will be meeting with 10 cooperating extension workers within your sub-delegation (EDDA, 5 NETP, and 4 non-NETP). Attached is her interview schedule.

Accept our best regards.

cc - Mrs. Lambert Ako/
   - Chief of Party, EDDA Yaounde
   - Dr. Esong, TLU Ekone
APPENDIX B

Interview schedules from the different zones.
INTERVIEW SCHEDULE IN CENTER PROVINCE

JULY 7TH - AUGUST 2ND

Monday 27th July

9.00 am  -  Interview with Mr. Bisingi
            National Coordinator Africa 2000

Thursday 30th July

2.30 - 3.30 pm  -  Interview with Mr. Awa, Ministry of
                   Agriculture

4.00 pm  -  Interview with Mr. Mezazem, Director
            of NETP, Ministry of Agriculture

Friday 31st July

9.30  -  Interview with Mr. Kom, Ministry of
       Agriculture (Dept. of Agricultural
       Policy)

11.00 am  -  Interview with Hon. Niba Ngu,
              Minister of Agriculture (Agric.
              Policy)

Saturday 1st August

4.00 pm  -  Interview with Dr. Atayi, Chief of
           Party, National Cereals Research and
           Extension (NCRE) Project

Thursday 13th August

9.00 am  -  Interview with Coordinator FIMAC
           (Sodecao)

Friday 14th August

9.00 am  -  Interview with Mr. Mokake, Technical
           Adviser No. 1, Ministry of
           Agriculture

Thursday 27th August

9.00 am  -  Interview with Sodecao extension
           agents (Monatele)

3.00 pm  -  Interview with farmers collaborating
           with Sodecao
INTERVIEW SCHEDULE IN THE NORTH WEST PROVINCE

AUGUST 3RD - 8TH 1992

Monday 3rd August

- Arrive Bamenda
- Confirm appointments with Mideno/Minagri

Tuesday 4th August

9.00 am
- Meet farmers collaborating with TLU Bambui

Wednesday 5th August

8.00 - 9.15 am
- Meet with Maize Breeding Team
10.00 - 11.15 am
- Meet with Agroforestry Team
11.30 - 12.45 pm
- Meet with TLU Team
1.00 - 2.30 pm
- Meet with Chief of Station (Dr. Tchamo Pierre)

Thursday 6th August

7.00 am
- Meet with Chief of Extension training and his deputy (Mr. Mbonchom Samuel and Mr. Asah Georges)

8.00
- Travel with the above persons to Babungo TDC’s to interview extension agents and TUBA

Friday 7th August

8.00 am
- Interview with Chief of Adaptive Research MIDENO/PDA (Mr. Yebit)

9.00
- Meet with farmers who collaborate with MIDENO/PDA

Saturday 8th August

8.00 - 9:00 am
- Interview with Chief of Service Agri. (Mr. Mbipeh Pius Shidiki)

9.15
- Leave for IRA Fombot
- Interview with Dr. Ngong Nassah
- Return to Yaounde

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SCHEDULE OF MRS. ENYONG - RESEARCH VISIT TO
SOUTH WEST PROVINCE

Thursday 4th June

2.00 - Courtesy call to Chief of Centre/Dupty IRA Ekona

Friday 5th June

9.30 - 11.30 pm - Interview with Church Women Group Mile 16

2.00 pm - Interview with Chief of Centre Ekona

Thursday 18th June

9.00 am - 12.00 pm - Interview with Extentions workers (Mixed) at SDDA Kumba

3.00 pm - Interview with Mukonje/Malende Farmers Group

Friday 19th June

8.30 - 10.30 am - Interview with Food and Fruit Crop Section IRA Ekona Researchers

11.00 am - 1.00 pm - Interview with ROTREP Project Researchers

1.30 - 3.00 pm - Interview with TLU-IRA Ekona Researchers

Saturday 20th June

9.00 - 10.30 am - Interview with South West Provincial Chief of Service for Agriculture

10.45 am - 12.30 pm - Interview with South West Provincial Delgate of Agriculture
### PROGRAMME DES ENTRETIENS AVEC MRS. ENYONG

**THESAR DE VIRGINIA TECH UNIVERSITY SUR LE TRANSFERT DE TECHNOLOGIE**

<table>
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<th>Date</th>
<th>Heure</th>
<th>Activité</th>
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<tr>
<td>24 JUIN (Mercredi)</td>
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<td>SODECOTON Formateur Regional a Maroua</td>
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<tr>
<td>25 JUIN (Jeudi)</td>
<td>09h</td>
<td>MINAGRI/PNVFA Chef de Service pour l'Extrême Nord (M. ADAMA) a Maroua</td>
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<tr>
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<td>16h</td>
<td>SODECOTON Directeur Adjoint de l'Assistance Rurale (M. BEKOLO) a Maroua</td>
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<td>Chercheurs TLU à Maroua</td>
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<td>Producteurs encadrés par le TLU à Gatouguel</td>
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<td>30 JUIN (Mardi)</td>
<td>08h</td>
<td>Agents PNVFA lors de la réunion mensuelle à Hina</td>
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<td>Producteurs encadrés par la SODECOTON à Kossewa dans le secteur de Dogba</td>
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<tr>
<td>02 JUIL (Jeudi)</td>
<td>09h</td>
<td>Chefs de secteur pour la région de Maroua à Maroua</td>
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<td></td>
<td>12h</td>
<td>Chercheurs de l'IRA en produits vivrières (sorgho, riz, arachide, miebe) à la bibliothèque de CRAM</td>
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APPENDIX C

Schedule showing dissertation advisor’s visit
PROFESSOR OLIVER’S VISIT
JUNE 2ND - 16TH 1992

Thursday 4th June
5.00 - Arrive Douala
14:00 - Courtesy call TLU Ekona
- courtesy call chief of station Ekona

Friday 5th June
9.30 - 11.30 - Focus group interview with women farmer group - mile 16
12.00 - 14.00 - Interview with Chief of Center Ekona

Saturday 6th June
10.00 - 12.00 noon - Progress meeting

Monday 8th June
8.00 am - Meeting with Dr. E. Atayi
9.00 am - Courtesy call Dr. Ayuk-Takem, Minister of Scientific research
- Meeting with Drs. Baker, Stilwell
12.00 - Lunch
14:30 - Courtesy call on NCRE Project Officer at USAID (Mr. Benbow)

Tuesday 9th June
- Leave for Dschang/Bamenda

Wednesday 10th June
- Meeting with Dr. Lyonga and Dr. Tchoumboue, Dschange University Center

- Return to Yaounde

Thursday 11th June
- Leave for Maroua
Meet TLU representative
Meet Chief of Center
Friday 12th June  -  SODECOTON

-  PNVFA

14:00  -  Leave for Garoua

Saturday 13th June  -  Progress meeting

Sunday 14th June  -  Return to Yaounde

Monday 15th June  -  Field visit Nkolfep

-  Meeting with Drs. Atayi, Stilwell and Baker

Tuesday 16th  -  Leave for the U.S.
APPENDIX D

Interview proposal showing different options for choice of participants.
INTERVIEW PROPOSALS

Focus Groups

Options are given with currently recommended option starred.

Farmers

A. 1 Collaborators with TLU - Center Province
    2 Collaborators with SODECAO - Center Province
    3 Collaborators with MINAGRI - Center Province
    4 Collaborators with TLU - Southwest Province
    5 Collaborators with MINAGRI (PNVFA) - Southwest Province
    6 Collaborators with TLU - Northwest Province
    7 Collaborators with MIDENO - Northwest Province
    8 Collaborators with TLU - Extreme North Province
    9 Collaborators with SODECOTON - Extreme North Province
   10 Collaborators with MINAGRI (PNVFA) - Extreme North Province

B.* 1 Collaborators with TLU, SODECAO, MINAGRI - Center Province
     2 Collaborators with MINAGRI, TLU - Southwest Province
     3 Collaborators with MINDECO, TLU - Northwest Province
     4 Collaborators with TLU, SODECOTON, MINAGRI - Extreme North Province

Extension Agents

A  1 SODECAO - Monitors, Center Province
    2 SODECAO - Supervisors, Center Province
    3 SODECOTON - Monitors, Extreme North Province
    4 SODECOTON - Supervisors, Extreme North Province
    5 MINAGRI - Monitors, Center Province
    6 MINAGRI - Supervisors, Center Province
    7 MINAGRI - Monitors, Southwest Province
    8 MINAGRI - Supervisors, Southwest Province
    9 MINAGRI - Monitors, Extreme North Province
   10 MINAGRI - Supervisors, Extreme North Province
   11 MIDENO - Monitors, Center Province
   12 MIDENO - Supervisors, Center Province

B  1 Monitors Center Province - SODECAO, MINAGRI
    2 Supervisors Center Province - SODECAO, MINAGRI
    3 Monitors Southwest Province - MINAGRI
    4 Supervisors Southwest Province - MINAGRI
    5 Monitors Northwest Province - MIDENO
    6 Supervisors Northwest Province - MIDENO
    7 Monitors Extreme North Province - SODECOTON, MINAGRI
C.* 1 Monitors and supervisors Center Province - MINAGRI
  2 Monitors and supervisors Center Province - SODECAO
  3 Monitors and supervisors Southwest Province - MINAGRI
  4 Monitors and supervisors Northwest Province - MIDENO
  5 Monitors and supervisors Extreme North Province - MINAGRI
  6 Monitors and supervisors Extreme North Province - SODECOTON

D. 1 Monitors and supervisors Center Province - SODECAO, MINAGRI
  2 Monitors and supervisors Southwest Province - MINAGRI
  3 Monitors and supervisors Northwest Province - MIDENO
  4 Monitors and supervisors Extreme North Province - MINAGRI, SODECOTON

Applied Researchers

A. 1 Coffee & Cocoa researchers - Nkolbisson
  2 Cotton researchers - Maroua/Garoua
  3 Food crop researchers - Nkolbisson
  4 Food crop researchers - Ekona
  5 Food crop researchers - Bambui
  6 Food crop researchers - Maroua/Garoua

B.* 1 Coffee & cocoa researchers - Nkolbisson
  2 Cotton researchers - Maroua/Garoua
  3 Cereals researchers - Bambui/Nkolbisson
  4 Roots & tubers - Ekona/Dschang/Nkolbisson

Adaptive Researchers

* 1 TLU - Nkolbisson
  2 TLU - Ekona
  3 TLU - Bambui
  4 TLU - Maroua

University Researchers

1 Collaborators on Bafou research
Individual Long Interviews

1  Minister of MRST
2  IRA - Head Center (Station) - Nkolbisson
3  IRA - Head Center (Station) - Ekona
4  IRA - Head Center - Maroua
5  IRA - Head Center - Foumbot or Head station - Bambui
6  IRA - Head Farming Systems Program (or representative)
7  IRA - Chief of Research Services
8  IRA - TLU coordinator
9  MINAGRI provincial delegate - Center Province
10 MINAGRI provincial delegate - Southwest Province
11 MINAGRI provincial delegate - Northwest Province
12 MINAGRI provincial delegate - Extreme North Province
13 MINAGRI, Yaounde, head of PNVFA
14 MINAGRI, Yaounde, head of extension?
15 SODECOTON - head of rural development
16 SODECAO - head of extension?
APPENDIX E

Checklist for interviews with the different groups involved in the study.
Check list format (Proposals)

Biographic - as is

Grand Tour 1: What does your work entail?

Topic: Does work concept include linkage, communication and feedback?

Planned Prompt: 1) Can you give examples where your work has helped farmers?
2) What is the relevance/importance of your work?

Grand Tour 2: How do you plan or decide on your work program?

Topic: What types of feedback are influencing work program?

Planned Prompt: 1) Are your plans based on farmer problems?
2) What types of meetings do you have?
3) How do you avoid duplication?

Grand Tour 3: What do you do with your results?

Topic: What are communication strategies?

Planned Prompt: 1) Who gets you results?
2) Can you give examples of what you have written/produced and who is now using?

Grand Tour 4: Will you please compare and contrast the types of professional contact you have with other researchers, extension and farmers?

Topic: Which linkage mechanisms are active?

Planned Prompt: 1) Are you communicating or linking effectively?
2) Can you give specific examples of times when you had good contacts?

Grand Tour 5: If if could be done, what would you change in the way research, extension and farmers work together and communicate with each other, and what would you leave the same?
Topic: What are strengths and weaknesses in current system for linkages, communication and feedback?

Planned Prompt: 1) Can you give specific examples of events that make you choose this aspect (to retain or change)?
2) What goal do you want to achieve by these changes?
3) Are your suggestions possible considering the crisis?

ANALOGOUS QUESTIONS FOR OTHER FOCUS GROUPS AND LONG INTERVIEWS
1. Tell me about yourself and how long you have been at your present position.
   - age
   - sex
   - qualification
   - position
   - working language

2. What kind of research do you do?

3. How do you plan or decide your annual work plans?
   - joint meetings
   - individual
   - based on farmers problems
   - avoid duplication

4. a. What do you do with your results?
       - publications-list
       - extension/technical bulletins
   b. Who gets them and how?
   c. How does extension get your results?

5. How do you apply this in the field?
   - How do you ensure that your research fits into real life situation
   - relevance
   - feedback

6. What kind of professional contact do you have with the university staff, extension, other researchers and farmers.

7. a. What part of the present system do you feel is best?
       - the way you work and communicate with research, extension, UCD, farmers and the administrators
b. Why? Give specific examples of events that make you choose this aspect.

8. What problems do you have now with communicating or linking effectively with extension, other researchers, UCD lecturers and farmers?

9. a. If you could make two changes in the present system what changes would you make?
   
   - the way you work and communicate with research, extension, UCD, farmers and the administrators
   
   b. Why? Give specific examples of events that make you choose this aspect.

10. a. If adequate finance was not a problem how would you organize communication linkages between research, extension, UCD, the administration and the farmers.

   b. Cite specific things you would do to achieve your goal.

11. Considering that there are financial limitations, how would you modify the plan you just described.
LINKAGES AMONG RESEARCH, EDUCATION, EXTENSION
AND FARMERS IN THE REPUBLIC OF CAMEROON

Checklist for Lecturers' Interview

1. Tell me about yourself and how long you have been at your present position.
   - age
   - sex
   - qualification
   - position
   - working language
   - What does your work entail?

2. How do you plan or decide your syllabus?
   - joint meetings
   - individual
   - based on farmers problems
   - avoid duplication

3. What do you do with your results? (To lecturers with a mandate for research)
   - publications - list
   - extension/technical bulletins
   - who gets them and how

4. How does extension get your results?
   (To lecturers with a mandate for research)

5. What are the sources of the information you pass on to your students (agents) during training?
   research results
   farmer feedback
   publications - list
   personal contacts
   What kinds of teaching aids do you use?

6. What kind of professional contact do you have with the university staff, extension, farmer and researchers?

7. How do you ensure that your research fits into the real life situations?
   - feedback
   - relevance
   - farmer participation
8.  a. If you had to change the present system i.e., the way you work and communicate with research, extension, UCD, farmers and the administrators, what two aspects will you retain?

   Why?

   b. Give specific examples of events that make you choose this aspect.

9.  a. If you had to change the present system i.e., the way you work and communicate with research, extension, UCD, farmers and the administrators, what two aspects will you definitely like to see changed?

   Why?

   b. Give specific examples of events that make you choose this aspect.

10. a. If adequate finance was not a problem how would you organize communication linkages between research, extension, UCD, the administration and the farmers.

   b. Cite specific things you would do to achieve your goal.

11. Considering that there are financial limitations, how would you modify the plan you just described?
LINKAGES AMONG RESEARCH, EDUCATION, EXTENSION
AND FARMERS IN THE REPUBLIC OF CAMEROON

Checklist for Extension Interview

1. Tell me about your self and how long you have been at your present position.
   - age
   - sex
   - qualification
   - position
   - working language

2. What does your work entail?

3. How do you plan or decide your annual work plans?
   - joint meetings
   - individual
   - based on farmers problems
   - avoid duplication

4. What do you do with your results/observations?
   - annual report
   - publications - list
   - extension/technical bulletins
   - who gets them and how
   - feedback to research/UCD

5. How does research/UCD/admini/others agents get your results/reports/observations?
   give specific instances

6. Where do you get the information you pass on to farmers?
   - how research communicates them to you

7. What kind of professional contact do you have with the university staff, researchers, extension and farmers.
   - seminars
   - publications (how often, how distributed)
8. How do you ensure that the research done by researchers fits into the real life situations?
   - feedback
   - joint sessions

9. a. If you could make two changes the present system i.e., the way you work and communicate with research, extension, UCD, farmers and the administrators, what aspects will you retain?
    Why?

   b. Give specific examples of events that make you choose this aspect.

10. a. If you had to change the present system i.e., the way you work and communicate with research, extension, UCD, farmers and the administrators, what two aspects will you definitely like to see changed?
    Why?

   b. Give specific examples of events that make you choose this aspect.

10. a. If adequate finance was not a problem how would you organize communication linkages between research, extension, UCD, the administration and the farmers.

   b. Cite specific things you would do to achieve your goal.

11. Considering that there are financial limitations, how would you modify the plan you just described?
LINKAGES AMONG RESEARCH, EDUCATION, EXTENSION
AND FARMERS IN THE REPUBLIC OF CAMEROON

Checklist for Administrators' Interview

1. Tell me about your self and how long you have been at your present position.
   - age
   - sex
   - qualification
   - position
   - working language

2. What does your work entail?
   - with respect to dealing with research, extension, UCD, and farmers

3. How do they communicate their problems, results to you?
   - contact
   - how often
   - what type of contact - lectures etc.

4. a. Do the above factors play any role in your decision making process?
   b. Give specific examples

5. a. If you had to change the present system i.e., the way you work and communicate with research, extension, UCD, farmers and the administrators, what two aspects will you retain?

   Why?

   b. Give specific examples of events that make you choose this aspect.

6. a. If you had to change the present system i.e., the way you work and communicate with research, extension, UCD, farmers and the administrators, what two aspects will you definitely like to see changed?

   Why?

   b. Give specific examples of events that make you choose this aspect.
7. a. If adequate finance was not a problem how would you organize communication linkages between research, extension, UCD, the administration and the farmers.

   b. Cite specific things you would do to achieve your goal.

11. Considering that there are financial limitations, how would you modify the plan you just described?

   Gender?
LINKAGES AMONG RESEARCH, EDUCATION, EXTENSION 
AND FARMERS IN THE REPUBLIC OF CAMEROON

Checklist for Farmers Interview Questionnaire

1. Tell me about yourself and how long you have been farming, the type of crops you plant?
   - age
   - sex
   - qualification
   - type of crops
   - working language

2. What kinds of problems do you sometimes have on your farm?

3. What do you about it?
   - who do you contact
   - how do you contact the person
   - if there were anyone else who sometimes helps with your farm problems

4. a. What is the best new idea you have implemented the past year?
   b. Where did you get this idea?
      - by what means

5. In what way has extension helped you?
   
   What do you think of their work?
   
   - does it help you, how?
   - are they doing enough
   - do you let them know what you want? how?
   - how do they contact you to tell you
   - how does extension give you some of the messages

6. a. What part of the present system do you feel is the best?
   
   - the way you work and communicate with research, extension, UCD, farmers and the administrators
   
   b. Why? Give specific examples of events that make you choose this aspect.
7. What problems do you have now with communicating or linking effectively with extension, researchers, UCD lecturers and other farmers?

8. a. If you could make two changes in the present system what changes would you make?
   - the way you work and communicate with research, extension, UCD, farmers and administrators

   b. Why? Give specific examples of events that make you choose this aspect.

9. In your opinion, how would you advise the government about the easiest way to work with farmers?
   - best way to contact them
   - best way to show them what new technology they have
   - best way to find out what kinds of problems they have
   - best way to know what they want
APPENDIX F

Flow chart showing the organizational structure of IRA.
APPENDIX G

Administrative organization of the UCD.
APPENDIX H

Structure of the NETP and how it fits into
the Ministry of Agriculture.
VITA

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