A STUDY OF THE ORGANIZATION AND OPERATIONAL

STRATEGIES TO LINK RESEARCH AND EXTENSION

IN THE AGRICULTURAL HIGHER EDUCATION

INSTITUTIONS IN ETHIOPIA

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CHAPTER I

INTRODUCTION


Ethiopia is located on the eastern part of the continent of
Africa between three and eight degrees north latitude, and thirty
eight and forty-eight degrees longitude with an area of 1.2
million square kilometers. The physical features of the country
are characterized by rugged mountains and plateaus rising to
4,550 meters in the highlands, and 116 meters below sea level in
the lowlands. Demographic studies indicate that a great majority
of the farming population live in these highland regions of the
country, while the lowland region is inhabited predominantly by
pastoral and nomadic settlers. The Rift-Valley, extending
northeast to southwest, is another important topographical
feature of the country that is particularly good for mechanized
and irrigated agriculture. River Wabi-Shebelle, which has 1130
kilometers length in the country, flows through this Rift-Valley.

Because of the high variations in altitude, three distinct
climatic zones exist. These are: the highland, the medium
altitude, and the lowland climatic zones. The highland region is
over 2400 meters  high with an average annual temperature of 15
degrees centigrade. The medium-altitude zone is between 1800 and
2400 meters high, characterized by a sub-tropical climate with an
average annual temperature of twenty-two degrees centigrade.  The

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lowland zone, usually marked by an altitude of less than 1800 meters high, is marked by a tropical climate with an average annual temperature of about 26 degrees centigrade.

Knowledge of the three climatic zones in Ethiopia gives the reader not only the opportunity to explore the relationship between altitude and temperature, but also the relationship between the climatic zones and natural vegetation. Huffnagel (1961), wrote that differences in the climate and the topography of Ethiopia present widely varied aspects of vegetation, from a scarce desert vegetation to Afro-Alpine plant communities. The commonly found trees in the high and medium altitude zone include Acacia, Kosso-Tree (Hagenica abyssinia), and Eucalyptus. The vegetation in the lowland zone consists of herbs, shrubs and small trees, but scarce vegetation is found when approaching the desert in the north and northeast. Maize, sorghum, teff, wheat, barley, millet, a vast variety of pulses, oil seeds, coffee, sugarcane, cotton, tropical fruits and vegetables are some of the widely cultivated crops in Ethiopia.

With regard to animal production, Ethiopia has wide varieties of livestock. Several studies indicate that the country ranks first in Africa and tenth in the world in its cattle population. Pickett (1991) noted that one fifth of the agricultural gross domestic product comes from livestock and the remainder from crops, with roughly one-half of the crop value added coming from coffee.

The soil of Ethiopia is generally fertile and good for the production of agricultural crops. Pickett (1991) indicated that Ethiopia's principal natural resource is its arable land, of which only fifteen percent is farmed at present. Murphy (1968) made an extensive study of the Ethiopian soils. He distinguished two main soil types, basically the red to brown clay loam which are generally fertile but lack phosphorus, and the black soils which are also fertile but quickly crack under low moisture content. Because of the high rainfall and high degree of leaching in the western regions of the country, the soil is generally acidic in character. On the other hand, in the central and southeastern regions, the soil is basic.

Ethiopia has been said to be rich in its mineral reserves such as gold, natural gas, copper, zinc, nickel, iron ore, platinum, potash, and coal. However, little has been proven for commercial production, either being mined or exploited in the past.

There are a number of rivers and lakes in the country. The Blue Nile and Wabi-Shibelle are among the longest rivers that cross the borders to the Sudan and Somalia respectively. Other important rivers are: Awash, Omo, Tekeze, Mereb, and Baro that vary in length between 277 - 1200 kilometers. Tana, Abaya, and Zeway are the three largest lakes in the country with a total area of 3600, 1160, and 434 square kilometers respectively.

The total population of the country as estimated in 1985 was 40,663,009, of which 36,533,389 were rural and 4,518,842 were

urban (The Central Statistical Authority, 1986). The population

distribution under fourteen and over fifty years of age

constitute 46% and 11% respectively according to the above

population estimate. Therefore, The youth and the senior citizens

group comprises 57%, whereas the rest of the population between

fifteen and forty-nine years of age constitute 43%.

The agricultural sector supports the bulk of the Ethiopian

economy. It accounts for over 40% of the national domestic

product, supports over 80% of the population, and supplies about

90% of all exports (Pickett 1991). Small scale peasant

agriculture is the predominant mode of production in Ethiopia,

with the use of traditional implements, human and animal labor.

The use of fertilizers and improved seeds is not widely spread in

the country. From the report of the Ministry of Agriculture in

Ethiopia, Pickett (1991) wrote that:

> Sixteen quintals of crop output per annum came
> from combining one hectare of land with the
> labor of three persons, one ox, and implements. . .
> Among the farmers surveyed, less than fourteen
> per cent used fertilizer, no more than 2% used
> pesticides, and irrigation was available to less
> than 5% of all farmers. More than half the farmers
> literally carried what little surplus they produced
> to their local market (p. 34).

As indicated by the foregoing, the Ethiopian peasant

agriculture is characterized by low productivity. This is the

result of the use of backward technologies, production methods

and high rate of population growth. As a result, the country has

been a victim of famine on several occasions. Famine results

either when there is shortage of rain during the seasons when it

is critically needed or when there is too much rain during the seasons when it is not needed at all, such as during the harvest seasons. Food transfer from regions of surplus production to food deficit regions within the country would help in this type of situation. However, it has been observed that the Ethiopian economy has not been sufficiently productive to deal effectively with situations of serious crop failure.

Low productivity of the agricultural sector can be attributed to so many factors, among which lack of resources and access to modern technology play the major role. Knowledge of modern production methods suitable to a certain locality is perhaps the most important factor to improve the standard of peasant agriculture in Ethiopia. This type of practice can also guard against adverse environmental conditions such as soil erosion and soil degradation which can possibly result in wide spread famine.

To be self-sufficient in food production, priority has been given to the development of the agricultural sector of the economy to reach at least 2500 calories per day per person (The Commission for Higher Education, 1986). The average consumption during this period was 1750 calories. The government's recent decentralization policy toward regional administration can also be a favorable ground to focus on regional agricultural problems through the generation and dissemination of region specific technology.

The Institute of Agricultural Research (IAR) is formally responsible for the generation of new agricultural technology in Ethiopia. IAR was established in 1966 to formulate agricultural research policy, to carry out research programs in selected parts of the country, and to coordinate research programs carried out by various organizations in the country. (ISNAR, 1987). However, agricultural research formally started with the establishment of the Imperial College of Agriculture and Mechanical Arts in 1952 (today's Alemaya University of Agriculture). Presently, all agricultural higher education institutions in the country consider research as one of their major educational objectives.

The Ethiopian Ministry of Agriculture is formally responsible for conducting agricultural extension in the country. Agricultural extension also started in the country soon after the institutionalization of agricultural research at Alemaya where two Ethiopians, who had graduated from the Ambo Agricultural School, were employed as extension agents on October 1, 1954 (the Oklahoma State University in Ethiopia, 1969). By 1963, there were 132 extension agents distributed throughout the country in a well organized program until this section of the college was transferred to the Ministry of Agriculture in this same year of 1963. Since then, the Ministry adopted several strategies to launch extension activities throughout the country. These include the conventional extension strategy, the "Minimum and Comprehensive Package Programs." The Minimum Package concept,

which was developed in 1970, implied the transfer of the benefits

of development to large number of people at minimum cost by

employing the methods and innovations developed and tested in the

Comprehensive Package Programs (Ministry of Agriculture, 1970).

An example of a "Comprehensive Package" project was the former

"Chilallo Agricultural Development Unit-CADU", later called the

"Arsi Rural Development Unit-ARDU). The fundamental aim of these

types of projects was to verify the performance of integrated

agricultural development strategy (Waktola, 1979). However,

agricultural extension is still one branch of activity in almost

all Agricultural Higher Education Institutions.

## Statement of Problem

The Agricultural Higher Education Institutions in Ethiopia

have national responsibilities in accomplishing their objectives.

Although these institutions were established in the Land-Grant

College model combining teaching, research and extension, located

at the different agro-ecological zones of the country, they

seldom address regional problems in terms of research and

extension.

The organization of research in terms of networking of

experiment stations and sub-stations, is insufficient for

tackling location specific problems and for the evaluation of

varieties and techniques, and in some institutions it is almost

non-existent. Research priorities are seldom planned. They are

set based on the availability of grants and funds from sponsors and research interests of individuals.

Extension is the most neglected area of activity in all of the Agricultural Higher Education Institutions in terms of program, organization, manpower and facilities. It has been attached to one of the academic departments without well defined program objectives, functions and territorial mandates. Gebrekidan (1982) described that extension and public service turned out to be the weakest areas of the overall activities of the Ethiopian Higher Education institutions in agriculture.

Institutional linkages between the Agricultural Higher Education Institutions, and institutions with similar research and extension interest, is very weak. ISNAR (1987) reported that the collaboration between the Institute of Agricultural Research and the colleges diminished significantly in recent years.

As the result, the research and extension components of these institutions failed to bring a significant impact upon the rural communities.

Rationale for the study

There is no more important problem confronting the Ethiopian agriculture today than adjusting the pattern of production to new order of agricultural technology generation, technology transfer, and structural adjustment. The Agricultural Higher Education Institutions have greater responsibility than ever to continue exploring agricultural science and its application.

However, the three-fold commitment of these institutions to teaching, research, and extension service needs to be reexamined to make sure each one of them is equal to the needs of the time. The use of this integrated system of teaching, research, and extension has rarely been effective in the Ethiopian Agricultural Higher Education Institutions in terms of technology generation and technology dissemination. Therefore, it is thought that the results of this study can serve as:

- An important information base for policy makers, college, and university administrators to promote research and extension activities.

- An alternative approach to conventional research and extension systems in the country.

## Purpose of the study

The purpose of this research was to study the organization and operational strategies to link research and extension in the Agricultural Higher Education Institutions in Ethiopia, based on the perceptions of agricultural educators and extension workers in those institutions, and suggest recommendations for the improvement of research and extension activities.

## Objectives of the study

The following specific objectives were developed in order to accomplish the purpose of the study:

1. To determine the demographic characteristics of the respondents.

2. To determine perceptions of the availability of selected current practices to educators and the influences they have on productivity in both research and extension activities.

3. To ascertain perceptions as to the extent to which selected problems impact upon effectiveness of research and extension in the Agricultural Higher Education Institutions in Ethiopia.

4. To determine appropriate research and extension organizational mechanisms as viewed by those currently engaged in such programs.

5. To determine practitioners' perceptions of operational strategies to promote the linkage between research and extension.

6. To determine perceptions of the roles of the National Research, Extension, and Higher Education Systems in the promotion of research and extension.

7. To make comparison across the institutions of perceptions associated with selected variables studied.

## Assumptions

It is assumed that the responses to any of the study questions are the true and honest reflections of the respondents' perceptions.

## Scope and Limitations

The scope of the study included Agricultural Higher Education Institutions conducting teaching, research, and extension located at different agro-ecological zones of the country. However, the teaching part of these institutions has not been intertained in this study. One agricultural university and two agricultural colleges have been included. The total population of respondents was considered for the study.

It is observed that the questionnaire was limited to the respondents holding the Master's degree and above for the faculty. However, academic qualification was not considered for the extension field staff.

## Definition and Description of Terms

Certain terms were used in a special way in this study. These terms and their definitions are as follows:

1. Organization: Refers to organizational structure, and to the organization of human and material resources.

2. Operational strategies: Administrative, organizational, and professional (functional) techniques, to promote the linkage between extension and research.

3. Agricultural Institutions of Higher Education: Institutions offering post secondary diploma and degree programs in agriculture as accredited by the Higher Education Main Department of the Ministry of Education in Ethiopia.

4.  Region: Administrative unit (area) with a clear political jurisdiction.

5.  Alemaya University of Agriculture: Hereafter used as "Alemaya" as required.

6.  Awassa College of Agriculture: Hereafter used as "Awassa" as required.

7.  Jimma Junior College of Agriculture: Hereafter used as "Jimma" as required.

CHAPTER II

LITERATURE REVIEW

Introduction

The central problem in technology generation and technology

transfer is the linkage between research and extension. It is

possible that a gap between them exists which can be attributed to

improper institutional organization or problems associated with

operation of programs. Although the aims and objectives of

research and extension remain quite similar in all countries,

their organization and management can be fashioned in different

manners in different countries to address local needs. In some

countries research and extension are conducted under the same

organization like the United States Land-Grant System. In others,

research and extension belong to either different organizations or

to the some organization with different management; which is known

as the conventional system. Since the purpose of this study is more

related to the US Land-Grant System, the literature review will

focus on this system with a general overview of research and

extension as a technology innovation process. For this purpose, the

literature review has been organized into four sub-topics to backup

and explain the objectives of the study from the point of view of

both theory and practice. These sub-topics include: The Conceptual

Framework of Research and Extension Interface; The Concept of

Resident Teaching, Research and Extension, and Its Origin and

Institutional Development in Ethiopia; The Organization of

Research and Extension in Agricultural Higher Education

Institutions; and Selected Operational Strategies to Link

Research and Extension.

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The Conceptual Framework of Research and

Extension Interface

</div>

Present knowledge about the interface between research and

extension is scanty and suffers from both institutional and

functional vacuum (Roling, 1990).   Nobe (1983) expressed that

there is a need to show the functions and tasks which must be

performed and the essential ingredients for success in research

and extension. Understanding this problem, the University of

Illinois at Urbana through the International Program for

Agricultural Knowledge System (INTERPAKS), developed a model to

evaluate technology development and transfer (Ruttan, 1987).

Figure 1 illustrates the conceptual framework of research and

extension interface. This figure is a simplified linear process

which shows the world stock of agricultural knowledge as a source

of information  for the development of science and technology.

The world stock of agricultural knowledge describes folk wisdom,

traditional and advanced science and technology held in the

international agricultural centers, and in research and extension

organizations of other countries (McDermott, 1987). Basic

| World Stock of Knowledge | | | | | | |
|---|---|---|---|---|---|---|
| Basic Research | Technology Generation | Technology Testing | Technology Adaptation | Technology Integration | Technology Dissemination | Diffusion & Adoption |

In the diagram:

<----------------Extension Organization----------------------------->

<------------------------------Research Organization------------->

<----Science---> <----------------------Technology Development------------> <----Technology Transfer-------->
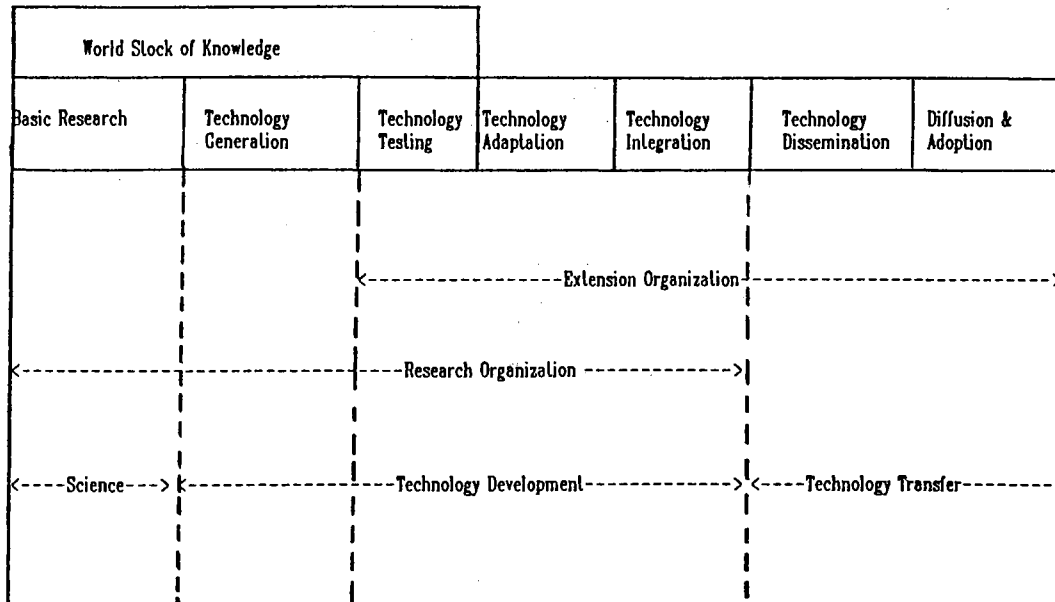
Source:   McDermott, J. K.   (1987).   Making extension effective: The
          role of extension research linkage. Agricultural
          extension worldwide.  New York, NY: Croom Heim.

     Ruttan, V. W. (1987).  Agricultural research policy and
          development.  Rome: Food and Agricultural Orgnization.

     Figure 1.  A Research and Extension Interface Model

research in the system is analogous to science, which has no value to farmers until it has been transformed into a form of technology. Technology generation refers to the practical use of basic research. This is the point where basic research is intended to benefit the farmers. Eventually, the process of technology generation must be tested for its performance under real farm conditions. In Figure 1, this is referred to as technology testing. Technology adaptation in the figure refers to the fine tuning of the technology generated to determine its performance in other conditions. Technology integration refers to the process of fitting the new technology into the farming system, integration with the market, and integration with the national policy (McDermott, 1987). Technology dissemination in the figure refers to teaching farmers how to fit the new technology into their farming system. Finally, informing the farmers to accept the new technology through external force, and his internal dynamics in the interface system are referred to as diffusion and adoption respectively. Rogers (1983) expressed that many decisions and activities must happen before the beginning of the diffusion of an innovation, and diffusion cannot be completely understood if these previous phases of the total process are ignored. The whole process starting from technology generation to technology integration in Figure 1 is referred to as technology development. Technology transfer includes the area covered by technology dissemination, and diffusion and adoption in the figure.

An important feature of Figure 1 is the positions of research and extension organizations in the interface system. It is expected that extension should start from the phase of testing the new technology and continue until the end of the technology transfer process, and research should obviously start from basic research and continue until the technology is fully integrated in the farming system. However, the most obvious cases are those where researchers and technology transfer workers are ignorant of each others activities. A continuing problem is the lack of suitable measure to objectively assess the strength of the links between research and extension (Sands, 1988). Collinson (1985) expressed that:

> Historically, research has stopped too early in what should be continuous and dynamic process of developing and diffusing new technology . Researchers have been physically and mentally isolated from farmers and have handed down an unfinished, and untested product to extension staff. Extension contact staff, squeezed between the farmers they living among, who often ridicule the technologies they bring, and their supervisors, who demand results in line with policy directives, have been caught in a crisis of morale (p. 83).

Research and extension need to be efficient to improve agricultural production. This requires that the two parties recognize that they share a continuum and have a vested interest in accomplishing their tasks. It also requires a comprehensive systems approach which examines the components, linkage and environment of the agricultural sector (Ruttan, 1987). Nogueira (1990) noted that:

Initially, both activities were considered to be
independent of each other but contributing to a
common purpose. Later, extension was considered
to be sequentially linked to research, receiving
its input from research and incorporating these
into a package of services from the farmers.
Subsequently, their reciprocal interdependence
was recognized, with extension identifying problems
and supplying information which enabled researchers
to define priorities. Finally, as in team interde-
pendence, there is less distinction between the two
groups, with extension agents participating in
experimentation and research coming closer to
producers (p. 82).

The research and extension interface concept can be summarized
by analogue to the systems theory. Lipman-Blumen and Schram in
Feller, Kaltreider, Madden, Moore, and Sims (1984) expressed the
interconnectedness of the system as:

A fundamental tenet of systems theory is inter-
dependency. That is, each component of the wider
system affects and is influenced by every other
component. A 'problem' or a dysfunction in one
part is a 'message' to the other system. A
system perspective suggests that difficulty in
any one component is a problem for the whole
system (pp. 7-8).

The Concept of Resident Teaching, Research

and Extension, Its Origin and Institutional

Development in Ethiopia

To understand the system of resident teaching, research,
and extension approach it is important to understand the basic
philosophy, function, and organization of its model, which is
widely known as the U.S. Land-Grant System.

The history of the Land-Grant System first started on July
2, 1862 when Abraham Lincoln signed the college Land-Grant Act,

of which Justin S. Morrill of Vermont was the principal author
(Nevins 1962). Several attempts to pass a Land-Grant College Bill
were made previous to 1862, but these laws had been consistently
defeated by states' rights legislators who viewed the federal
grant of land to a state as a threat to the states' power
(Rogers, 1989). However, the law was passed during the Civil War
period and provided each state an acreage of federal land to
support a state college or university for teaching agriculture
and mechanical arts. Rogers (1989) further noted that early
professors of scientific agriculture realized a demand for
agricultural research, which resulted in the Hatch Act of 1887.
The Hatch Act provided federal funds for state agricultural
experiment stations to be established and added to the Land-Grant
College, with the director of the experiment station being
responsible to the dean of agriculture, the university president
and the state government. Today, an average of about one dollar
out of four spent at the state experiment stations is federal
origin (Rogers, 1989). Rogers (1989) further noted that starting
in 1914, the Smith-Lever Act provided federal grant-in-aid funds
to each station for extension purposes. The extension service
worker in each state is a Land-Grant College or University staff.
In some states, the dean of a Land-Grant Collage is responsible
for classroom teaching, research and extension. In other states,
there is separate director of research as well as a separate
director of extension. However, they both work very closely with
the dean of agriculture.

Therefore, from the above development trend, it can be understood that the three functions of the Land-Grant College System, mainly teaching, research and extension, evolved over a period of fifty years, and the coordination of these three functions is of vital importance to the effectiveness of each.

Propp (1968) distinguished three main philosophies of the Land-Grant System as education for all people regardless of economic or social status; concern with service to the people and the state; and the legitimization of practical vocational education as a fit subject for university training.

The philosophy of the Land-Grant System as first conceived by Justin Morrill, who first initiated the system, was to enable people of all economic and social levels to participate in higher education practice oriented education particularly in agriculture, veterinary science, home economics, engineering and military training. The result was extending higher education to those who previously could not afford to attend the private college, particularly the rural population.

The second aspect of the Land-Grant College philosophy was concerned with public service for both the immediate and long range needs of the society. Land-Grant Colleges have been responsive to the needs of rural people and have been able to adapt to changes in these needs. Propp (1968) described:

> The colleges have developed an out-ward-looking
> orientation and feeling of responsibility for
> agricultural development in the state, rather
> than an inward-looking ivory-tower program with
> little relationship to current rural and
> agricultural problems  (p. 13).

The third aspect of the Land-Grant College System deals with the recognition of practice-oriented agricultural and mechanical arts education to equal status with the traditional professions like law, medicine and philosophy. This was with the intention of establishing proper balance between fundamentals and applications of knowledge toward practical solutions of rural problems.

Full-grown agricultural universities in the United States as they exist today did not appear soon after the passage of the Morrill Act of 1862. Rather, they gradually developed their functions as need dictated. Navins (1962) a hundred years later indicated that the first Land-Grant Colleges were primarily concerned with instruction, although research was organized as an important supplement and there were early extension efforts.

Today, the Land-Grant technology generation and technology transfer system is one of the most successful national programs world wide. A comparative literature review as to the advantages and disadvantages of transferring this model to the developing nations is presented in a later section of this chapter. However, it is worthwhile to look at some of the important features and characteristics of the system which contributed to its success in the United States. Rogers (1989) believed that there are eight major elements in the US Land-Grant System. These are:

- A critical mass of new technology, so that the diffusion
  system has a body of innovations with potential usefulness
  to practitioners.

- A research subsystem oriented to application, as a result of the incentives and rewards for researchers, research funding policies, and the personal ideologies of the researcher.

- A high degree of user control over the research application process, as evidenced through client participation in policy determination, attention to user needs in guiding research and extension decisions, and the importance accorded feedback from clients on the system's effectiveness.

- Structural links among the technology transfer system's components, as provided by a shared conception of the system, use of the common 'language' by members of the system, and by a common sense of mission.

- A high degree of client contact by the linking subsystem, which is facilitated by reasonable agent-to-client ratios and by a relatively homogeneous client audience.

- A 'spannable' social distance across each interface between components in the system. Social distance is reflected in professionalism, formal education, technical expertise, and specialization.

- Evolution of extension as a complete system for technology transfer, rather than as a research utilization system grafted on as an additional component of an existing research system.

- A high degree of control by the system over its environment, enabling the system to shape the environment rather than passively reacting to change in this environment (p. 148).

It is understood that the Land Grant System of the United States has successfully responded to the changing demands of the nation's socio-economic conditions over a span of long period of time. However, many observers believe that the transfer of this model to developing nations did not bring the required socio-economic changes to the rural communities in those countries. The system is believed to be transferred without adequate modifications to accommodate resources, and social and cultural limitations in those countries. Ruttan (1968), as cited by Arnon, (1989) characterized the United States with developed

institutional infrastructures linking the universities to other private and public institutions, and any attempt to adapt the model to societies without these infrastructures would rarely perform an effective instrument of technical, social, or cultural change. In the United States, there exist a large number of agricultural colleges which depend on the good will and support of the farming communities, and since these conditions rarely exist in developing nations the model will hardly succeed (Arnon, 1989). Rogers, Eveland and Alden, (1984) expressed that this model was transferred to the third world nations without adequate modification, because, these poor nations could not afford a sufficient number of extension workers per thousand farmers, nor did they effectively connect agricultural research with extension.

The reservations regarding the suitability of the Land-Grant system of organization in no way lessen the importance of the basic principles underlying the system in developing nations (Arnon, 1989). Those who criticized the transfer of the system to the developing nations did not deny the importance of the principles underlying the system, provided they are critically examined in light of the conditions of the individual countries, and then properly adapted to those conditions. Examples of developing countries which successfully adopted the system include India, Philippines, and Nigeria.

In India, the agricultural university system was organized in the early fifties based on the Land-Grant model. This system grew substantially with the establishment of seven universities during

1968 - 1971, and seven other universities during 1972 - 1978, and

there are now twenty-three agricultural universities in the country

(Randhawa, 1987). Jain (1989) wrote that in the Philippines:

> Following the policy decision of the early 1970s to
> reorganize the research system in the Philippines,
> the government decided to down-grade the role of
> the Ministry of Agriculture in the organization and
> conduct of research, and they handed over much of this
> responsibility to the colleges of agriculture in the
> universities. There is no fundamental reason why
> faculties of agriculture in many other developing
> countries should not be similarly harnessed to
> provide support for the development of the countrys'
> agriculture (p. 41),

Jain (1989) further noted that in northern Nigeria, the

University of Ahmado Bello serves as a main source of technology

generation for over sixty million people. Gebrekidan (1982)

expressed that:

> In an agricultural institution, since teaching,
> research and extension are mutually supportive, they
> should not be separated. The implementation of
> comprehensive regional development projects centered
> around agricultural institutions of higher learning
> could offer them excellent opportunities to be
> functionally involved in rural development and improve
> their teaching, research and extension (p. 106).

The origin of the system of teaching, research and extension

in Ethiopia goes back to 1952, when the Oklahoma State University

under the United States AID program first established a College

of Agriculture in Ethiopia. The Addis Ababa University (formerly

the Haile Sellasse I University) was first committed to the

establishment of an agricultural college in the country (Wagaw,

1990). The university committee for drafting the paper work for

establishing an agricultural college according to Wagaw (1990),

recommended on March 11, 1952, the establishment of an

Agricultural College to provide university level training outside
of Addis Ababa as a constituent part of the Addis Ababa
University. While the Board of Education of the Ministry was
working on the recommendation of the committee, the Ministry of
Agriculture on the other hand considered the establishment of a
College of Agriculture in consultation with the United States
Technical Cooperation Administration and the United Nations Food
and Agricultural Organization experts. In May 1952, the
governments of Ethiopia and the United States concluded an
agreement for a cooperative agricultural education program.
However, it was not clear whether the government accepted the
initiation of the Ministry of Education or the Ministry of
Agriculture for its consideration to establish a College of
Agriculture through the US-Ethiopian joint venture.

The objectives of the US-Ethiopian joint venture in the
development of Agricultural Education and Mechanical Arts as
stated in the agreement document of May 15, 1952 were:

- To promote and strengthen friendship and understanding
  between the people of Ethiopia and the United States of
  America and further their general welfare.

- To aid the efforts of the people of Ethiopia to develop their
  agricultural and related resources, to improve their
  working and living conditions to further their social and
  economic progress.

- To facilitate the development of agricultural and mechanical
  arts education activities in Ethiopia through cooperation
  action, and

- To stimulate and increase the interchange between the  two
  countries of knowledge, skills and techniques in the field of
  agricultural and mechanical arts education (p. 1).

The US-Ethiopian joint venture agreement provided the establishment of an "Imperial Ethiopian Agricultural And Mechanical Arts College" as an independent agency of the Ethiopian government. The director of the program was appointed by the United States government with the approval of the of Ethiopian government, and also served as the President of the College. According to the US-Ethiopian joint venture agreement document, the established Ethiopian College of Agriculture and Mechanical Arts would have the function of instruction, lecture, demonstration, research, and other educational activities to promote the development and use of agricultural and mechanical techniques among the Ethiopian people.

The Oklahoma State University acted on behalf of the US government to control the operation of the College. College class work began in September, 1953 at the former Jimma Agricultural Technical School in southwestern Ethiopia. In 1956, the College started on a new site at Alemaya in Harar province.

The amended contract agreement between the United States of America and the Oklahoma State University in March 1966, indicated that the college of Agriculture (formerly the Imperial College of Agriculture and Mechanical Arts) would perform a well balanced curriculum of instruction in agricultural sciences and related subjects, agricultural extension, and a comprehensive program of agricultural research. Today, all the agricultural colleges in the country offering regular agricultural programs, and the Agricultural University at Harar, follow the same system

of teaching, research, and extension in their educational
objectives as it was first initiated in 1952.

The history of formal agricultural education in Ethiopia
goes back to the establishment of the Ambo Junior College of
Agriculture (formerly the Ambo Agricultural School) in 1931,
located about one hundred-twenty five kilometers west of the
capital city, Addis Ababa. This college is said to be the oldest
agricultural training institution in the country. This school was
upgraded to an Institute of Agriculture under the Ministry of
Agriculture in 1969 and then to a Junior College of Agriculture
in 1983 under the Commission for Higher Education (today known as
the Higher Education Main Department of the Ministry of
Education). Currently, it is a two-year diploma program, training
development agents and agricultural teachers with an average
annual total enrollment of about two hundred students as indicated
in Table I. This table shows the capacity of the Agricultural Higher
Education Institutions in Ethiopia in terms of student enrollment.
There was a total of 3168 students throughout the country enrolled
in the different fields of agriculture in all of the Agricultural
Higher Education Institutions during the 1988/89 academic year.
Similarly, Table II shows the number of full-time Ethiopian academic
staff by their academic rank (career stage) during the 1988/89
academic year.  There were 6, 22, and 112 Associate Professors,
Assistant Professors, and Lecturers respectively.

The establishment of the Ambo School of Agriculture was
followed by the establishment of a similar institution in the

TABLE I

STUDENT ENROLLMENT IN THE REGULAR PROGRAMS OF AGRICULTURAL
HIGHER EDUCATION INSTITUTIONS IN ETHIOPIA
FOR THE 1988/89 ACADEMIC YEAR

| Institutions | Sex | | Total |
| --- | --- | --- | --- |
| | Male | Female | |
| Alemaya University of Agr. | 1591 | 74 | 1665 |
| Freshman Program | 794 | 44 | 838 |
| Agricultural Economics | 178 | 8 | 186 |
| Agricultural Engineering | 110 | 0 | 110 |
| Animal Science | 189 | 14 | 203 |
| Plant Science | 217 | 5 | 222 |
| Forestry | 30 | 1 | 31 |
| Graduate College | 73 | 2 | 75 |
| Ambo Junior College of Agr. | 192 | 20 | 212 |
| General Agriculture | 180 | 19 | 199 |
| Agricultural Teachers | 12 | 1 | 13 |
| Awassa College of Agr. | 547 | 45 | 592 |
| Freshman Program | 295 | 30 | 325 |
| Agricultural Engineering | 48 | 0 | 48 |
| Animal Science | 56 | 1 | 57 |
| General Agriculture | 68 | 1 | 69 |
| Home Economics | 20 | 11 | 31 |
| Plant Science | 60 | 2 | 62 |
| Faculty of Veterinary Med (Addis Ababa University) | 155 | 4 | 159 |
| Jimma Junior College of Agr. | 375 | 28 | 403 |
| General Agriculture | 345 | 27 | 372 |
| Plant Science | 30 | 1 | 31 |
| Wondo-Genet Forestry College | 133 | 4 | 137 |
| Forestry | 133 | 4 | 133 |
| Total | 2993 | 175 | 3168 |

Source: Higher Education Main Department. (1990). Statistics on
Higher Education: 1988/89 Academic Year. Department of
Statistics and Educational Information. Addis Ababa,
Ethiopia.

TABLE II

FULL TIME ETHIOPIAN TEACHING STAFF IN THE AGRICULTURAL HIGHER
EDUCATION INSTITUTIONS BY ACADEMIC RANK (CAREER STAGE)
DURING THE 1988/89 ACADEMIC YEAR

| Institution | Academic Rank | | | | Total |
|---|---|---|---|---|---|
| | Professor | Assoc.Prof. | Assist.Prof. | Lecturer | |
| Alemaya | – | 6 | 13 | 63 | 82 |
| Ambo | – | – | – | 9 | 9 |
| Awassa | – | – | 4 | 20 | 24 |
| Faculty of Vet. Med. | – | – | 5 | 8 | 8 |
| Jimma | – | – | – | 12 | 12 |
| Wondo-Genet | – | – | – | – | – |
| Total | – | 6 | 22 | 112 | 135 |

Source: Higher Education Main Department. (1990). Statistics on
Higher education: 1988/89 academic year. Department of
Statistics and Information. Addis Ababa, Ethiopia.

western part of the country. This was the former Jimma

Agricultural School established in 1952, which is known today as

the Jimma Junior College of Agriculture. It was a two-year post

secondary diploma program training students mainly in general

agriculture with a total enrollment of about four hundred

students a year in its regular program. Currently, both

the Jimma and Ambo Colleges are directly administered by the

Higher Education Main Department of the Ministry of Education.

A four-year degree program began in 1952 with the

establishment of the Imperial Ethiopian College of Agriculture

(presently the Alemaya University of Agriculture), by the

Ethiopian government and USAID contract to the Oklahoma State

University. A critical shortage of high level trained man-power in

the country led to the establishment of a graduate program in

agriculture in 1979 as part of the Alemaya University of Agriculture

(Alemaya University of Agriculture, 1990). In 1988/89 the university

had a total enrollment of about 1665 students in its graduate and

undergraduate regular programs, and about eighty teaching staff

holding a Masters degree and above.

In 1963 the Ministry of Agriculture established the Institute

of Animal Health Assistants, which was a two-year diploma program.

This institute was merged with the Faculty of Veterinary Medicine in

1988. The Faculty of Veterinary Medicine itself was established in

1979 under the auspices of the Addis Ababa University. Although this

faculty was not designed with the teaching, research, and extension

model, its research contribution is worthwhile.

In 1977 the Ministry of Agriculture again established the Wondo-Genet Forestry and Wild Life Resource Institute in collaboration with the Swedish government (Mekonnen, Abebe, and Gebremariam, 1990). Today, this institute is called "The Wondo-Genet Forestry College," which is directly administered by the Ministry of Agriculture. Basically it is a two-year post secondary diploma program.

Finally, the Awassa College of Agriculture was established in 1975, to provide mid-level agricultural manpower in various agricultural fields including animal sciences, plant sciences, home economics, and agricultural engineering under the auspices of the Addis Ababa University. The ground work has been completed to start a four-year degree program in Agricultural Engineering.

Mekonnen et al. (1990) indicated that agricultural training institutions have prime objectives of producing mid and high-level agriculturalists, conducting basic and applied research, and disseminate technologies for use by the agricultural community. However, there is no indication that all the three objectives exist in some of the institutions like the faculty of Veterinary Medicine and the Wondo-Genet Forestry College. Extension is the most neglected area in these institutions (Gebrekidan, 1982).

## The Organization of Research and Extension in
## Agricultural Higher Education Institutions

The organization of research and extension in agricultural higher education institutions largely depends on the policy

objectives of that particular country. Rigney and Cumming (1970) expressed that agricultural colleges and universities should have a legal base which confers adequate power, financial support, organizational autonomy, and integrated programs of education, research, and extension. The main policy concern will be to fulfill its obligation in attaining the goals set at national and institutional levels, at the same time maintaining a high scientific standard (Arnon, 1989). Elliot (1987) stressed that each organization can be approached in terms of mandate, objective, resources, and management of both its internal functions and outward linkage of its environment.

## The Organization of Research

An effective research organizational structure clearly identifies authority relationships, channels of communications, and provides an appropriate research environment. Arnon (1989) indicated that the structure of a research organization must be built on the basis of the functions it has to fulfill, minimize overlapping of duties, and allow flexibility to cope with emergencies.

Agricultural research is basically location specific. The International Service for National Agricultural Research-ISNAR (1984), described that research activities must be developed at the agro-ecological sites where the problems are, and decision making processes must reflect those conditions in program development. The adaptation of a network approach, where several research centers shaped with one center acting as the lead institution was found

particularly useful (FAO and UNDP, 1984). In agricultural colleges and universities, the functional administrative unit is the department. Arnon (1989)) described that academic departments are usually based on disciplines which has a large measure of autonomy, and comprise commodity groups responsible for researching a certain commodity or commodities. Hobbs (1990) suggested that work groups could be organized by knowledge and skill such as breeding and entomology, or by work process and function such as engineering and marketing. In practice, commodity groups can also function as interdisciplinary task groups (teams). The advantage of interdisciplinary team work is that different skills needed for the solution of a problem are grouped together so that the team is able to solve problems requiring the cooperation of several disciplines. However, team work has infiltrated the academic world to the point where individualism has largely disappeared and originality has lost out to uniformity of thought and action (Arnon, 1989).

FAO studies in selected developing counties indicated that it was not evident that in the institutions of higher agricultural education agricultural research priorities were reflected in their programs (FAO and UNDP, 1984). ISNAR (1984) justified that priority setting is one of the most important weaknesses and difficulties encountered in attempting to develop realistic research efforts. Norton (1987) suggested the following criteria to determine research priorities:

- Whether the research causes an increase in the use of relatively abundant resource and a saving of relatively scarce resources.

- The quantity and severity of research problems.
- Non-duplication with transferable research from
  outside the country.
- The extent of private sector incentive to conduct
  the research.
- Current emphasis in the research program (p. 78).

Levels of agricultural priority setting in the US Land-Grant

System according to Lipman-Blumen (1987) include priority setting

at Land-Grant College and State Agricultural Experiment Station

level; priority setting activities of the Joint Council and the

User Advisory Board; Agricultural Emergencies; and Congressional

priority setting.

## The Organization of Extension

Swanson (1984) wrote that the term "extension" originated in

England to describe a university extension system with the objective

of bringing the educational advantage of universities to ordinary

people. In the American tradition, the term is used to emphasize

that it is an additional activity which seeks to teach people to

solve their problems by 'exchanging' information (Arnon, 1989). In

developing countries, extension is designed to improve the

productivity of small farmers who have limited access to

information. However, in the agricultural higher education

institutions, extension is confronted with organization and subject

matter responsibilities, and in general, extension  in developing

countries is confronted with several deficiencies. Mounder (1973)

described these deficiencies as:

- Lack of general understanding and appreciation of
  the role of extension education in rural development.
- Failure to establish a national policy for the scope
  of extension service responsibility and program.
- Lack of continuity of extension programs due to
  political instability and changes in agricultural
  policy, personnel and other government services and
  institutions.
- Failure to provide an effective balance in the
  allocation of limited resources among the necessary
  elements of rural development such as extension
  education, agricultural research, credit, agrarian
  reform, and other elements of agricultural modernization.
- Failure to provide proper balance between technical and
  educational competence in the staffing of the extension
  service (p. 47).

The organization of extension involves such factors as

organizational structure, regulatory functions, and the full

integration and involvement of extension activities in development

processes. Roling (1988) expressed that:

> The fact that extension is an instrument deployed by
> institutions automatically introduces an organizational
> element. Extension cannot be seen in isolation from
> organization and management. Extension organization and
> management have some special characteristics caused by
> the fact that extension is an instrument to induce
> change (p. 48).

With regard to the organization of extension in agricultural

higher education institutions, Jain (1989) suggested a separate

department of technology transfer staffed with extension and

socio-economics scientists. Jain further noted that in some very

large institutions, this department may take a higher profile in

the form of an extension directorate. Figure 2 illustrates the

organizational structure of the extension section of an

Agricultural University in India, showing that at the

top level, extension is coordinated by a Director of Extension

Education. The Director is assisted by Associate Directors for

Director of Extension Education

```
Associate        Associate          Joint Director              Head of
Director         Director           Extension                   Departments
(Training)       (Farm Advisory)    (Extension)

                                    Extension        District Extension
                                    Specialist       Specialist at
                                    at university    District level
```
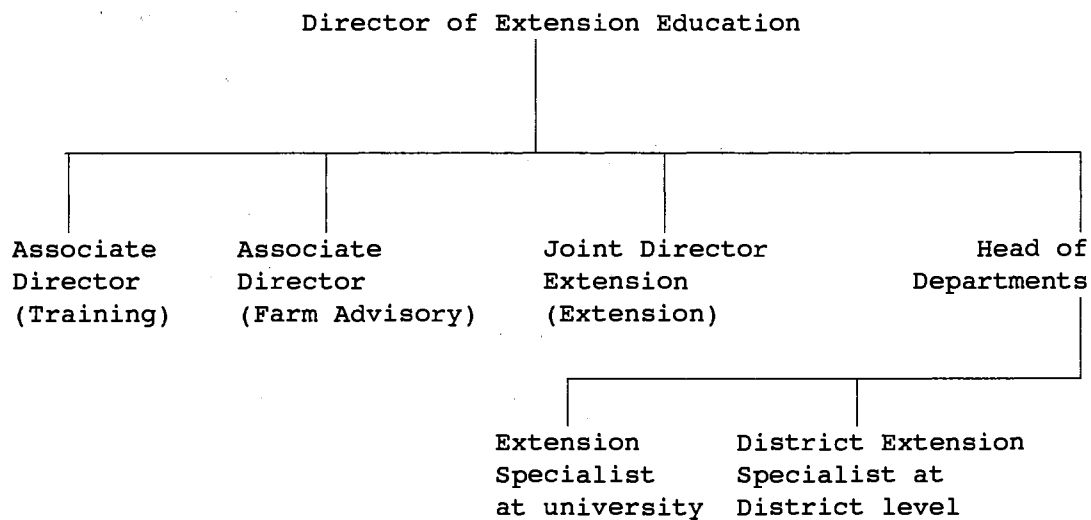
Source: Randhawa, N.S. (1987). <u>Agricultural research in India. An
        overview of its organization, management and
        operations.</u>  Rome:FAO.


    Figure 2. Organizational Setup of the Directorate of Extension
              Haryana Agricultural University, India

Training, Farm Advisory and Heads of Departments. It is understood that the typical agricultural university of this type in India is engaged in training, farm-advisory functions and offering specialized services through the designated extension subject matter specialists.

Baum and Tolbert (1985) expressed that the design and implementation of an extension service is one of the most complex and problem prone aspects of agricultural projects. In designing the organization of an extension system, Baxter, Slade and Howell, (1989) suggested that the first step is to understand the current extension system, local administration, rural settlement patterns, and cultural and agricultural conditions of the region. Other factors that need to be understood include the effectiveness of agricultural research and other services, the availability of useful technical messages for farmers, the number of skilled staff available for extension, as well as government and farmers' financial resources. Another problem area in the organization of an effective extension organization is determining the minimum number of extension workers required to make a significant impact on the agriculture of a region. This depends on the density of the rural population, the technical and educational level of farmers, the degree of mobility of the extension workers, and the potential of the region for increased production and diversification. FAO studies indicate that the desirable extension agent to farmer ratio to be between 1:350 and 1:1000 for developing nations. The ratio of subject matter

specialist to front-line extension worker is also an important factor to be considered in extension organization. Claar and Bentz (1984) suggested the world-wide ratio of 1:16 - 1:17 for Asia and Africa; 1:12 - 1:13 for Europe; and 1:20 for the USA. As to the training and skills of subject matter specialists, Denning (1985) argues that subject matter specialists should be trained in the Farming Systems Research approach as a source of appropriate technology to recommend to farmers.

Finally, for an extension program to be effective, there is a need for continuity and stability in its work. Watts (1984) concludes that an extension law is necessary which defines the mission of extension, the means of finance, and the overall responsibilities of the service.

## Selected Operational Strategies to Link
## Research and Extension

Operational strategies refer to specific organizational procedures used to promote research and extension links. Merrill-Sands and McAllistair (1988) suggested that some of these strategies are internal in that they can be controlled or influenced by leaders of the institutions; others are external and are influenced by the institutions' broader physical, political and socio-economic environment. Snyder (1988) discussed formal and informal linkage mechanisms between research and extension organizations. Formal mechanisms follow officially specified patterns, whereas informal ones are built on personal

relations. Kaimowitz, Snyder, and Engel, (1990) described factors

in formal linkage mechanisms as committees, task forces,

interagency agreements etc, and informal mechanisms as exchange

of resources and information without official sanction through

personal contacts. These internal and external, or formal and

informal, linkage mechanisms require certain conditions for

effective technology generation and transfer processes. Ewell

(1989) described these conditions as:

- A shared analysis of target farmers' conditions and
  problems.
- Technical alternatives to farmers' current practices
  which can be successfully adapted to suit local
  circumstances through on-farm research.
- Well trained and committed professional in the
  institutions responsible for both research and
  extension.
- A clear division of responsibilities assigned to
  each institution a set of tasks for which it has
  a relative advantage.
- Effective linkage mechanisms together with
  administrative and budgetary support, which
  allow researchers and extensionists to plan and
  carry out coordinated programs (p. 189).

Discussions regarding effective linkage between research and

extension activities must address what constitutes effective

linkage mechanisms. Kaimowitz et al. (1990) indicated this to be

availability of new technologies, relevance of new technologies,

responsiveness of new technologies to needs of farmers, and

institutional sustainability.

Several other research and extension linkage mechanisms have

been identified by different authors. Based on a review of

literature, particularly Ewell (1989) and Kaimowitz et al.

(1990), the following linkage mechanisms will be discussed below

briefly. These linkage mechanisms are: The Integrated System of
Training, Research, and Extension in one institution; Farming
Systems Research and Extension; The Training and Visit System;
On-farm Research; Joint Committees of Various Sorts; and
Strengthening Agricultural Information Departments.

## The Integrated System of Training,

## Research and Extension

This system of the United States Land Grant model, that brings
the functions of training, research, and extension to an academic
environment, made significant advances in agricultural production
in the country. Rogers (1983) described this system as a non-
linear set of interactions between the several stages of research
and extension for a successful technology transfer program.
Figure 3 illustrates the research and extension interaction part
of the model. The extension specialist, who resides in one of the
academic departments, plays a liaison role between the county
agricultural agent and the experiment stations, with a two-way
information flow from both directions.

## Farming Systems Research

## and Extension

Certain goals cannot be achieved by research on individual
commodities and require a systems approach. Eicher and Baker (1982)
expressed that the primary goal of Farming Systems Research and
Extension is to design programs which are holistic,
interdisciplinary, and cost-effective in generating technology. The

```
                    ┌─────────────────────────────────────────┐
                    │            AGRICULTURE                   │
                    │                                          │
                    │                                          │
                    │         ┌──────────────────┐             │
                    │         │    EXPERIMENT     │            │
                    │         │ RESEARCH STATION  │            │
                    │         └──────────────────┘             │
                    │              │    ▲                      │
                    │              ▼    │                      │
                    │         ┌──────────────────┐             │
                    │         │ EXTENSION SPECIALIST │          │
                    │         └──────────────────┘             │
                    │              │    ▲                      │
┌────────────────────┐            ▼    │                      │
│ COMMUNITY AND RURAL │        ┌──────────────────────┐        │
│    DEVELOPMENT      │        │ COUNTY AGRICULTURAL AGENT │     │    ┌──────────────┐  ┌──────────┐
└────────────────────┘        └──────────────────────┘        │    │HOME ECONOMICS│  │4-H YOUTH │
                    └─────────────────────────────────────────┘    └──────────────┘  └──────────┘

                              ┌────────────────────────────────┐
                              │  COOPERATIVE EXTENSION SERVICE  │
                              └────────────────────────────────┘
```
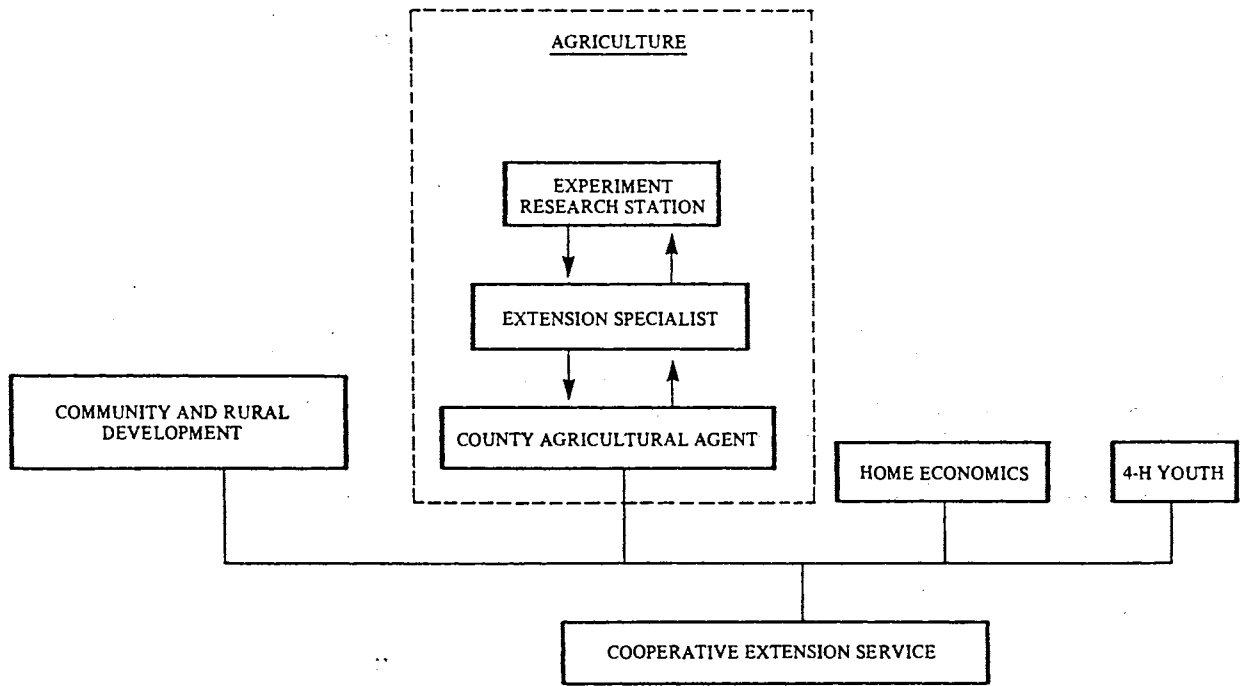
Source: Filler, I. (1987). Technology transfer, public policy, and
        the cooperative extension. In Vernon W. Ruttan (ed.)
        Policy for agricultural research. Boulder: West View
        Press.

Figure 3. The Cooperative Extension Service System

major concerns of this system are gaining first-hand information

about farmers, and understanding the farm as an entire system rather

than the isolation of components within the system. Farming Systems

Research and Extension is carried out by a team comprised of

several disciplines and a team leader. Simmonds (1984) in Stoop

(1987) suggested the following three forms of the system:

- The description of base data analysis for existing
  farming systems in a holistic way to obtain an
  understanding of the interaction between various
  components of the system, involving technical,
  biological, and socioeconomic, and institutional
  aspects.
- On-farm research with Farming Systems Perspective
  (OFR/FSP), which is complementary to on-station
  research and should be directly linked to it.
- Development of new Farming Systems which would
  involve a radical restructuring of the entire system
  (e.g., the changes from shifting and/or fallow
  cultivation to permanent cultivation (pp. 6-7).

The activities of Farming Systems Research may vary

substantially with geographic considerations. However, Kellog (1983)

suggested target and research area selection, problem identification

and development of a research base, planning and analysis of on-farm

research, and extension of results as core activities in the system.

Farming Systems Research and Extension represents an important

step toward user control as an essential ingredient of success of

technology development. Roling (1990) expressed that Farming Systems

Research seeks to ensure goodness-of-fit between technology and its

users, by emphasizing the importance of collecting information from

and about farmers before designing technology and while testing it.

## The Training and Visit System

Among the various efforts to improve the functioning of conventional extension services, the best known is the Training and Visit System (Arnon, 1989). This system was conceived by Daniel Benor for the World Bank and described in detail in Benor and Harrison (1977). The basic goal of the Training and Visit System is to organize a professional extension service to assist farmers in raising production (Benor, 1987). This system is based on a systematic, time-bound program of visits and training by extension agents with closely supervised and clearly specified schedules of work, duties, and responsibilities (Arnon, 1989). The fundamental principles of the Training and Visit System, according to Benor (1987), are:

> Professionalism; a single line of command; concentration of effort; time-bound work; a field and farmer orientation; regular and continuous training; two way linkage between extension and research (p. 138).

Although this system of extension is described in the literature as a professional approach to extension service, it was not without criticisms. Major criticisms of the system by Swanson and Claar (1984) included the following:

> It is too top-down oriented and does not allow enough farmer participation in program planning; it is too rigid in terms of the fortnightly schedule, particularly during the slack seasons; it is too labor intensive, requiring a large number of extension workers which a country may not be able to afford; it does not make effective use of mass media method of communication; due to the serious lack of Subject Matter Specialists in nearly all Third World nations, extension's linkages to research are weak resulting in poor technical training and backstopping; and because many of these extension

organizations are run in an authoritarian manner, extension worker supervisor is often not sufficiently positive and supportive to improve extension worker morale (pp. 10-11).

It is conceivable that there can be no one system of extension suited to all farming conditions. Climatic, administrative, and socio-economic factors all contribute to the variation. To be successful, any system must be adapted to fit local conditions. However, Benor (1987) believed that the flexibility that enable successful adaptations to be made in the system does not allow for adaptation of the Training and Visit basic principles.

## On-farm Research

This system is approached by some to be a phase of Farming Systems Research and Extension, and by others as a desirable component of all agricultural research and development. However, its basic principle is to establish direct contact between farmers and researchers. Roling (1990) expressed that it is a way of improving the interconnectedness of agricultural knowledge and information system and is a critical step toward user control. The initiative of this system is to make both researchers and extension workers focus on factors affecting farmers' daily decisions. The On-farm approach is believed in the literature to break down the traditional barriers between research and extension. However, Ewell (1989) expressed that On-farm research cannot in itself solve the problems of technology transfer, or substitute for an effective extension system.

In summary, a model was developed to illustrate the conceptual framework of the interface between research and extension. The concept of the integrated system of teaching, research, and extension, and its origin and institutional development in Ethiopia were discussed in this chapter. Several views were presented regarding the organization of research and extension in agricultural higher education institutions. Some selected operational strategies to link research and extension were also presented.

# CHAPTER III

## METHODOLOGY AND PROCEDURE

### Introduction

There are great varieties of research tools developed to aid in the collection of data.  Each tool is particularly appropriate for certain sources of data to yield information that would be most effectively used, and each is appropriate in a given situation.

This study was basically designed to describe the research and extension conditions in the Agricultural Higher Education Institutions in Ethiopia as they existed during the time the study was conducted, and suggest possible improvement ideas based on the perceptions of educators in these institutions. Therefore, a descriptive research method was used for the collection and analysis of the data required for the study.

A descriptive research  method as a research tool according to Best can be used to describe, record, analyze, and interpret conditions that exist to discover the relationships between exiting variables. This research method was judged as particularly suitable for this study because it allowed the investigator to analyze the interactions between the factors that explained present status, or that influence change showing development over a period of time.

Key (1992) identified three basic types of descriptive research, namely, the survey method, correlation studies, and developmental studies. The survey method helps to investigate the existing conditions; correlation studies assist the investigator to find out the relationships between variables; and the developmental studies tend to determine changes over time. The survey and correlation methods were utilized in this study.

Kerlinger (1986) noted that survey research is probably best adapted to obtain personal and social facts, beliefs, attitudes, and it is a useful tool for educational fact finding. Survey research is very economical as compared to the amount of information that can be obtained by this method. Within sampling error, the information from survey research is accurate; and the accuracy of properly drawn samples of individuals or families remarkably portrays the values, beliefs and attitudes of a community (Kerlinger, 1986). However, survey research is time-consuming, demands relatively large amounts of money, and requires a great deal of research knowledge. The most commonly used survey methods are the questionnaire, telephone survey, and personal interviews.

Within the frame-work of available time and funds for this study, the use of a questionnaire was found more appropriate than the other two methods. A sample copy of the questionnaire is presented in Appendix A. Best (1986) described the mailed questionnaire as probably both the most used and most criticized data gathering device in educational research. The criticism is

mainly directed to the poor response rate. Kerlinger (1986) also
stated that responses to mail questionnaire are generally poor;
returns of less than forty or 50 percent are common. However, for
this study, as indicated in Table IV, the response rate was 73%.
Gay (1981) stated that in comparison to the use of an interview
procedure, a questionnaire is much more efficient in that it
requires less time, is less expensive, and permits the collection
of data from a much larger sample.

### Population of the study

Agricultural Higher Education Institutions currently
conducting research and extension in their academic programs, and
located at the different agro-ecological zones of the country
were considered for this study. These institutions and their
faculty size for the 1988-89 year are depicted in Table III. Out
of the six Agricultural Higher Education Institutions listed in
Table III, the Faculty of Veterinary Medicine of the Addis Ababa
University and the Wono-Genet Forestry College did not have any
extension programs. The Debre-Zeit Agricultural Research Station
under the Alemaya University of Agriculture which had relatively
strong research programs and a fairly developed extension system,
and the Ambo Junior College of Agriculture, which had only eight
qualified faculty for this study during the survey period are
both located in the same agro-ecological zone (central highlands),

TABLE III

FULL TIME ETHIOPIAN TEACHING STAFF BY LEVEL OF QUALIFICATION IN
THE AGRICULTURAL HIGHER EDUCATION INSTITUTIONS
DURING THE 1988/89 ACADEMIC YEAR

| Institutions | Levels of Qualification | | | | Total |
|---|---|---|---|---|---|
| | Diploma | Bachelor's | Master's | Doctorate | |
| Alemaya | 49 | 50 | 65 | 15 | 169 |
| Ambo | 9 | 7 | 10 | – | 26 |
| Awassa | – | 25 | 15 | 5 | 45 |
| Faculty of Vet. Med.(Addis A.U.) | 1 | 5 | 4 | 20 | 30 |
| Jimma | 14 | 8 | 14 | – | 36 |
| Wondo-Genet Forestry Col. | 7 | 14 | – | – | 21 |
| Total | 80 | 109 | 108 | 40 | 327 |

Source:  Higher Education Main Department. (1990). Statistics on
Higher Education: 1988/89 Academic Year. Department of
Statistics and Information. Addis Ababa, Ethiopia.

about one hundred seventy kilometers apart. Therefore, the Ambo area research and extension activity was considered to be represented by the Alemaya University of Agriculture.

In view of this, the Agricultural Higher Education Institutions whose faculty members qualified for this study were the Alemaya University of Agriculture, the Awassa College of Agriculture, and the Jimma Junior College of Agriculture, from the eastern, southern, and western parts of the country respectively.

All current agricultural full-time academic staff who were capable of conducting scientific research (i.e. those with Master's degree and above), and all extension full-time field staff, regardless of their academic qualifications in these institutions, were considered for the study. The above three institutions were requested by letter and subsequent telephone conversation with the officials of these institutions to supply lists of faculty and extension field staff. In response to the request, lists containing 60, 30, and 16 faculty and extension field staff who met the above criteria were obtained from Alemaya, Awassa, and Jimma respectively. However, when the survey was conducted six months later, the faculty and extension field staff records were 53, 25, and 15 for Alemaya, Awassa, and Jimma respectively. Therefore, the instrument was distributed to this total accessible population of 93 faculty and extension field staff in the three institutions listed above. The rates of response for each of these institutions is reported in Table IV.

TABLE IV

RESPONSE RATE TO THE INSTRUMENT BY INSTITUTION

| Institutions | Questionnaire Amount | |
|---|---|---|
| | Number Distributed | Number Returned |
| Alemaya University of Agriculture | 53 | 35 (66%) |
| Awassa College of Agriculture | 25 | 20 (80%) |
| Jimma Junior College of Agriculture | 15 | 13 (87%) |
| Total | 93 | 68 (73%) |

Design of Procedure for Collection of Data

Before distributing the instrument, it was necessary to design a strategy for data collection. This included identification of key persons to coordinate the survey process, identification of communication channels with these persons, and identification of method for delivering the instrument and obtaining the completed instrument.

The key persons identified as potentially helpful for the collection of the data were the Vice-President for Academic Affairs at the Alemaya University of Agriculture, the Deans of both the Awassa College of Agriculture, the Jimma Junior College of Agriculture, and a research coordinator who was a senior faculty, and who would be responsible for coordinating the distribution and collection of the instruments (see acknowledgment).

The communication channels identified between the investigator and the individuals listed above were the use of official letters, and telephone conversations with all concerned in the coordination of the survey. The Vice-President for Academic Affairs of the Alemaya University of Agriculture, the two Deans of Awassa and Jimma Colleges, and the designated senior faculty were approached by telephone by the researcher from Oklahoma State University to explain the nature of the research and to ascertain their cooperation in the data collection process. After assuring their willingness and cooperation to conduct the research in the respective institutions, the

telephone conversation was followed by official letters form
Office of International Programs of the Oklahoma State University
to obtain the lists of individuals who qualifying to complete the
instrument from each institution. Copies of the correspondence
are presented in Appendix B.

After the number of subjects from each institution and the
key persons for coordinating the data collections were
identified, ready made copies of the instrument were sent to the
research coordinator through an express mail by the DHL Company,
which took only three days to get into the hands of the
coordinator. The research coordinator delivered the instrument to
each institution, and  collected the completed instrument with
the help of the above mentioned officials in those institutions.
The completed instruments were sent back to the researcher using
the same express mail system.

<center>Identification of Information and Development</center>

<center>of the Instrument</center>

The questionnaire was considered to be the most important
data collecting tool to this research. Therefore, identification
of the required information for the study and developing the
instrument were the two crucial factors in the data gathering
process.

The instrument was designed to address the objectives of the
study as stated in the Chapter I. The design of a data collection
instrument which would deal with each of the objectives was based

on literature review, information from the Dissertation Advisory

Committee, and personal experience of the investigator. A copy of

In this regard, the first section of the instrument was designed to

collect information regarding the demographic characteristics of the

respondents. The portion of the instrument dealing with

current practices focused on major facility resources, human

factors, and organizational issues as available to educators, and

as they influence their productivity. The section dealing with

problems impacting the effectiveness of research and extension

focused on institutional systems analysis, such as research and

extension coordination and policy issues. In order to collect

information on the organization of research and extension, the

instrument was designed to focus on coordination, priority

setting, networking, and selected functions of research and

extension. The operational strategies portion of the instrument

was designed to collect data on organizational mechanisms and

functional techniques to link research and extension. The section

of the instrument dealing with the National Research, Extension,

and Higher Education Systems was designed to collect information

on the roles of these organizations in strengthening research and

extension in the Agricultural Higher Education Institutions.

Furthermore, the instrument was designed to measure the

level of perception of the respondents by securing their choices

on a five-point scale of equal intervals, with two opposite ends

on a continuum, such as strongly agree on the one end, and

strongly disagree on the other, or very satisfied on the one end, and very dissatisfied on the other end of the continuum. The middle point of the continuum was considered neutral or average. Open ended questions were provided at the end of each section and at the end of some selected questions to allow the respondents to express their views freely. Furthermore, the respondents were encouraged to express their views and comments on any of the information provided by a letter on the front page of the instrument. This letter also included information on why the study was required, and the importance of the participation of the respondent in the study.

After the instrument was developed, a pilot test was conducted using graduate students from Ethiopia currently studying at the Oklahoma state University, who used to be faculty members, and were involved in some activity of research and extension in one the institutions selected for this study. Ten graduate students participated in the pilot test. They represented the University of Agriculture at Alemaya, the Awassa College of Agriculture, and the Jimma Junior College of Agriculture. The purpose of the pilot test was to identify missing information, and to determine the content validity and reliability of the instrument. Significant and valid suggestions were obtained from the pilot test and were utilized to improve the instrument.

The instrument was also evaluated for content validity. Content validity measures the degree of representativeness of

items (questions) included in the instrument of the total domain

of traits being measured. Content validity is judgemental

(Kerlinger, 1986); this implies, each item must be judged for its

relevance to the property being measured. The content validity of

this study was measured by a panel of experts, the Dissertation

Advisory Committee. The committee was furnished with the

universe of the content as it was stated in objectives of the

study to indicate the directions to make judgement. Adjustments

were made according to suggestions of the committee to include more

items. The instrument was also reviewed by individuals who were

"experts" in the field for making use of independent judgement. The

result of the pilot test was also useful for determining the content

validity of the instrument.

The concern for instrument reliability emerges from the need

for dependability in measurement. Answers to two questions were

sought. First, can similar results be obtained if the same

set of objects are measured again and again using the same

instrument? Then, how true are the results obtained from the

measuring instrument? From the above two questions it can be

understood that the reliability of an instrument tends to address

the stability and accuracy of the instrument. The internal

consistency method was applied to determine the reliability of the

instrument in this study. Key (1992) stated that the internal

consistency method provides a unique estimate of reliability

expressed by the Cronbach's alpha as follows:

$$\alpha = Np/[1 + p(N - 1)]$$

Where:

$\alpha$ = The Cronbach alpha

N = The number of items, and

p = the mean inter-item correlation

In this study, the pilot test results were used to determine the internal consistency of the instrument, and it was determined by considering each section of the instrument separately. For the nine identified sections, the computed internal consistency alpha levels were 0.90, 0.93, 0.89, 0.93, 0.93, 0.95, 0.64, 0.94, 0.94, which in the researcher's judgement were high enough to justify the internal consistency of the instrument.

## The Institutional Review Board

Since the study involved human subjects, it was reviewed by the Institutional Review Board (IRB) of the Oklahoma State University to see if the Federal Regulations of the United States, and the Oklahoma State University policy to protect the rights and welfare of human subjects involved in these types of research had been met. The research was granted permission to continue. A copy of the IRB approval is attached.

## Analysis of data

Since descriptive research methods were used for this study, descriptive statistical tools were primarily applied to summarize the data in numerical forms. The common forms of descriptive

statistics include the mean, variance, standard deviation, and the graphic presentation of the data in a form of bar, frequency, or other forms of similar graphs. The Kruskal-Wallis one-way analysis of variance was used to make comparison across the institutions of selected variables. This non-parametric method is analogous to one way analysis of variance (Kerlinger, 1986). The Kruskal-Wallis test is very powerful and is a preferred technique when the available data are measured on at least the ordinal scale (Daniel, 1978). This method was repeated with two groups (institutions) at a time for significant variables to identify the groups which were significantly different.

As has been mentioned previously, respondents were asked to indicate their perceptions regarding certain aspects of the study by means of five-point, Likert-type scales. In this case, numerical mean were calculated by multiplying the values of the response category by the number of respondents, summing the product and dividing the sum by the number of respondents. This yielded figures which were then analyzed in terms of where they fell within the continuum of response choices.

Two other areas involving Likert-type scales were designed to determine respondents' levels of satisfaction and extent of agreement with selected items. For these, each category of respondents was labeled. In order to be able to classify mean response into one of these categories, an analysis and interpretation plan was developed. This involved assigning a numerical value to each category. Real limits were established

for each category for the purpose of classifying each numerical mean response. The categories, values assigned and Range of Real Limits were as follows: Very Dissatisfied and Strongly Disagree--1--1.49 and below; Dissatisfied and Disagree--2--1.5 to 2.49; Neutral--3--2.5 to 3.49; Satisfied and Agree--4--3.5 to 4.49; Very Satisfied and Strongly Agree--5--4.5 and above.

CHAPTER IV

FINDINGS OF THE STUDY

Introduction

This section of the study is designed to summarize and present
data collected and organized in regards to each of the following
research objectives:

1. To determine the demographic characteristics of the
respondents.

2. To determine perceptions of the availability of selected
current practices to educators and the influences they have on
productivity in both research and extension activities.

3. To ascertain perceptions as to the extent which selected
problems impact upon effectiveness of research and extension in the
Agricultural Higher Education Institutions.

4. To determine appropriate research and extension organization
mechanisms as viewed by these currently engaged in such programs.

5. To determine practitioners perceptions of operational
strategies to promote the linkage between research and extension.

6. To determine perceptions of the roles of the National
Research, Extension, and Higher Education Systems in the promotion
of research and extension in the Agricultural Institutions of Higher
Education in Ethiopia.

7. To make comparison across institutions of perceptions associated with selected variables studied.

The data have been summarized in numerical forms for all objective questions in the instrument. Views and suggestions expressed by the respondents in the open ended parts of the instrument have been classified based on the grouping of the variables in the instrument. A great many of the findings have been presented in the form of tables, and the rest in the form of text and graphics.

Presentation of the findings of the study was done in four categories. The first category included presentation of the data from the demographic characteristics of the respondents, and it was attempted to present the data by institution for comparison purposes. No effort was made to make a statistical test to compare the institutions in this regard. The second category was concerned with presentation of the combined average data of the three institutions without any attempt to break down by institution. The first and the last objectives were excluded from this category. The third category was concerned with making a statistical test comparison across the three institutions by using the variables from the second category. Summary of the test results is presented in the Summary part of Chapter V. The fourth category was concerned with presentation of the data from the open-ended part of the instrument of the study. The views and suggestions of the respondents were classified and presented based on the objectives of the study and the groupings of the variables in the instrument.

Demographic Characteristics of

the Respondents

The gender classification of the respondents indicated the
Agricultural Higher Education Institutions were male dominated.
Out of the sixty-eight respondents of this study, only four were
females. This makes 6% female against 94% male. The four females
were equally divided between the Alemaya University of Agriculture
and the Awassa College of Agriculture. In Jimma, there were no
female instructors. In the history of the college there has been
only one contract female instructor in agricultural economics during
the period 1978 - 1980.

Figure 4 illustrates the age structure of the respondents. In
this figure, it is indicated that, the minimum age was 26 and the
maximum was 55. The average age was thirty-five, and the most
frequently reported age, the mode, was thirty-eight. The majority of
the older age group (above 40 years) was found in the Alemaya
University of Agriculture.

Table V is a presentation of the career stage (academic rank)
of the respondents. The respondents had career stages between
Lecturer and Associate Professor. There were no Professors in any of
the agricultural fields of the Agricultural Higher Education
Institutions. There were three Associate Professors who responded to
this study, and they all belong to the Alemaya University of
Agriculture.  There were six Associate Professors in agriculture
throughout the nation in 1988, as reported in Table II.  Out of the
14 Assistant Professors who responded to this
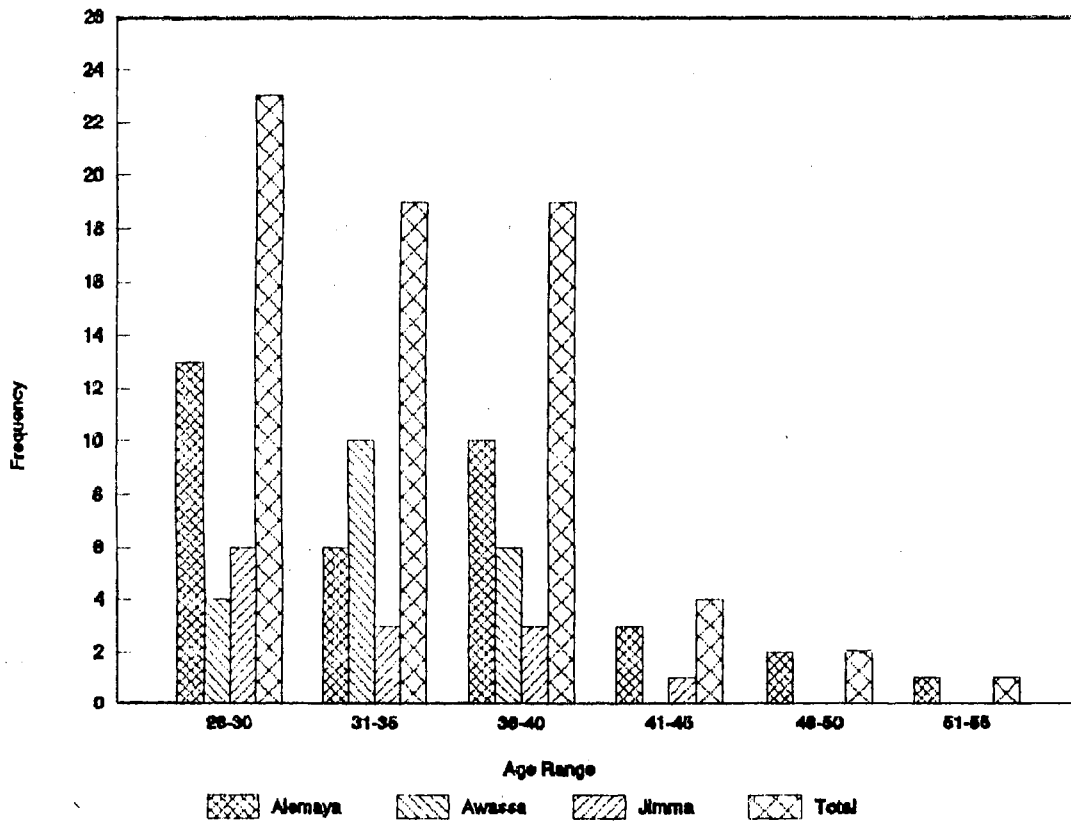
Figure 4.  Age Structure of Respondents

TABLE V

CLASSIFICATION OF RESPONDENTS BY THEIR CAREER STAGES

| Career stage | Distribution by Institutions | | | | | | Total | |
| | Alemaya | | Awassa | | Jimma | | | |
| | N | % | N | % | N | % | N | % |
|---|---|---|---|---|---|---|---|---|
| Professors | – | – | – | – | – | – | – | – |
| Associate Prof. | 3 | 8.5 | – | – | – | – | 3 | 4.4 |
| Assistant Prof. | 10 | 28.5 | 3 | 15.0 | – | – | 14 | 20.6 |
| Lecturers | 22 | 63.0 | 17 | 85.0 | 13 | 100.0 | 51 | 75.0 |
| Total | 35 | 100.0 | 20 | 100.0 | 13 | 100.0 | 68 | 100.0 |

study, ten of them (70%) belong to Alemaya, and the rest to the Awassa College of Agriculture. There were no Assistant or Associate Professors in Jimma. Of the total respondents, 75% were lecturers, 20% Assistant Professors, and the rest, 5%, were Associate Professors.

Table VI contains a summary of the academic qualifications of the respondents. From this it was determined that about 76% of the respondents hold Master's degrees and about 20% hold the Doctorate degree. All academic staff needed to have the Master's degree and above in order to qualify to complete the instrument according to the design of the study, unless the respondent was a full-time extension field staff, and thereby was not required to have such a high academic qualification to complete the instrument. Only 3% of the respondents hold less than a Master's degree. In all the three institutions, the majority of the staff who completed the instrument hold a Master's degree. In Alemaya, this group constituted 66%. In Awassa, they constituted 85%, and in Jimma, they constituted 92%. Out of the 14 respondents holding a Doctorate degree, 12 of them belong to Alemaya, which was about 86%, of the total, and the rest to Awassa. There were no respondents holding the Doctorate degree in Jimma, either during the 1989 inventory of the Higher Education Main Department (Table III), or during the period of this study.

Table VII was developed to depict the number of years since the obtained highest degree was achieved by the respondent. It was found that 69% of all the respondents received their highest degree

TABLE VI

CLASSIFICATION OF RESPONDENTS BY THEIR LEVEL OF QUALIFICATION

| Level of Qualification | Distribution by Institution | | | | | | Total | |
|---|---|---|---|---|---|---|---|---|
| | Alemaya | | Awassa | | Jimma | | | |
| | N | % | N | % | N | % | N | % |
| Doctors | 12 | 34.0 | 2 | 10.0 | – | – | 14 | 20.5 |
| Masters | 23 | 66.0 | 17 | 85.0 | 12 | 92.0 | 52 | 76.5 |
| Bachelors | – | – | 1 | 5.0 | – | – | 1 | 1.5 |
| Others | – | – | – | – | 1 | 8.0 | 1 | 1.5 |
| Total | 35 | 100.0 | 20 | 100.0 | 13 | 100.0 | 68 | 100.0 |

TABLE VII

NUMBER OF YEARS SINCE HIGHEST DEGREE WAS OBTAINED BY THE
RESPONDENTS

| Year Range | Distribution by Institution | | | | | | Total | |
| | Alemaya | | Awassa | | Jimma | | | |
| | N | % | N | % | N | % | N | % |
|---|---|---|---|---|---|---|---|---|
| 1 - 5 | 23 | 65 | 16 | 80 | 8 | 61 | 47 | 69 |
| 6 - 10 | 7 | 20 | 3 | 15 | 4 | 31 | 14 | 22 |
| 11 - 15 | 2 | 6 | - | - | 1 | 8 | 3 | 4 |
| 16 - 20 | 2 | 6 | 1 | 5 | - | - | 3 | 4 |
| 21 - 25 | 1 | 3 | - | - | - | - | 1 | 1 |
| Total | 35 | 100 | 20 | 100 | 13 | 100 | 68 | 100 |

less than 5 years prior to when this survey was conducted, and 91%

of all the respondents received their highest degree less than ten

years ago. The rest, 9%, received their highest degree between

11 and 25 years ago.  Table VIII is a presentation of the years of

services of the respondents in their present institutions.  40% of

the respondents had six to ten years of experience, 29% had less

than five years of experience, 25% had 11 to 15 years of experience

and the rest, 6% had between 16 and 25 years. The majority of the

respondents from Jimma and Awassa fell in the experience range

between six and ten years, whereas for Alemaya the majority was in

the category of less than five years.  However, only Alemaya has

respondents with experience above 21 years. As established by data

presented in Table IX, 28 of the respondents, 41% did not

participate in any research projects at the time when this survey

was conducted.  This table is a summary of the number of research

projects and the number of respondents currently participating in

those projects.  Out of the total respondents, about 12%

participated in one research project, 13% participated in two

research projects, and 9% participated in three projects.

Participation in more than five research projects was dominated by

the faculty from Alemaya.  It was interesting to note individuals

participating in 20, 25,or 32 research projects in a university

where there were no full-level professors in any of the agricultural

disciplines.

TABLE VIII

YEARS OF SERVICE OF THE RESPONDENTS IN THEIR PRESENT INSTITUTIONS

| Range of service years | Distribution by Institution | | | | | | Total | |
|---|---|---|---|---|---|---|---|---|
| | Alemaya | | Awassa | | Jimma | | | |
| | N | % | N | % | N | % | N | % |
| 1 - 5 | 14 | 40 | 5 | 25 | 1 | 8 | 20 | 29 |
| 6 - 10 | 10 | 28 | 10 | 50 | 7 | 54 | 27 | 40 |
| 11 - 15 | 8 | 23 | 5 | 25 | 4 | 30 | 17 | 25 |
| 16 - 20 | 1 | 3 | - | - | 1 | 8 | 2 | 3 |
| 21 - 25 | 2 | 6 | - | - | - | - | 2 | 3 |
| Total | 35 | 100 | 20 | 100 | 13 | 100 | 68 | 100 |

TABLE IX

DISTRIBUTION OF RESPONDENTS BY RESERACH PROJECTS IN WHICH THEY
CURRENTLY PARTICIPATE BY INSTITUTION

NUMBER OF RESEARCH PROJECTS

|  | 0 | | 1 | | 2 | | 3 | | 4 | | 5 | | 6 | | 7 | | 10 | | 11 | | 17 | | 20 | | 25 | | 32 | | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
|  | N | % | N | % | N | % | N | % | N | % | N | % | N | % | N | % | N | % | N | % | N | % | N | % | N | % | N | % | |
| ALEMAYA | 7 | 10 | 4 | 6 | 6 | 9 | 2 | 3 | 3 | 4 | 1 | 1.5 | 1 | 1.5 | 3 | 4 | 1 | 1.5 | 1 | 1.5 | 1 | 1.5 | 1 | 1.5 | 1 | 1.5 | 1 | 1.5 | 35 |
| AWASSA | 9 | 13 | 4 | 6 | 2 | 3 | 4 | 6 | 1 | 1.5 | – | – | – | – | – | – | – | – | – | – | – | – | – | – | – | – | – | – | 20 |
| JIMMA | 12 | 18 | – | – | 1 | 1.5 | – | – | – | – | – | – | – | – | – | – | – | – | – | – | – | – | – | – | – | – | – | – | 13 |
| TOTAL* | 28 | 41 | 8 | 12 | 9 | 13 | 6 | 9 | 4 | 5 | 1 | 1.5 | 1 | 1.5 | 3 | 4 | 1 | 1.5 | 1 | 1.5 | 1 | 1.5 | 1 | 1.5 | 1 | 1.5 | 1 | 1.5 | 68 |

*Due to rounding, all percentage totals do not equal 100

Table X contains a summary of the research projects completed
by the individuals. Forty percent of the respondents did not have
any research projects. Twenty percent of the respondents had
completed at least one project. About 12% completed eight projects,
and about 13% completed three projects. As was true for current
participation in research projects, the completion of five or more
projects by individuals was accomplished by respondents from
Alemaya.

In the following sections of this chapter, findings relative to
perceptions of the respondents were grouped based upon the
objectives of the study, and generally in the order they appear
on the instrument. Since all the respondents did not react to all
the questions in the instrument, the number of subjects
(respondents) varied considerably for each variable studied. Five-
point Likert-type scales were used to determine respondents'
perception regarding the variables under investigation. Although
grouped together on the data-collection instrument, research and
extension activities were treated separately in order to provide
the needed focus upon each.

Perceptions of Availability and

Influence on Productivity

of Selected Practices

Table XI was constructed to report findings on the study
relative to perceptions of the extent to which selected current

TABLE X

DISTRIBUTION OF RESPONDENTS BY NUMBER OF RESEARCH STUDIES COMPLETED

NUMBER OF RESEARCH STUDIES COMPLETED

| | 0 | | 1 | | 2 | | 3 | | 4 | | 5 | | 6 | | 8 | | 10 | | 12 | | 15 | | 20 | | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | N | % | N | % | N | % | N | % | N | % | N | % | N | % | N | % | N | % | N | % | N | % | N | % | |
| ALEMAYA | 12 | 18 | 5 | 7 | 4 | 6 | 5 | 7 | - | - | 1 | 1.5 | 1 | 1.5 | 2 | 3 | 1 | 1.5 | 1 | 1.5 | 2 | 3 | 1 | 1.5 | 35 |
| AWASSA | 8 | 12 | 6 | 9 | 3 | 4 | 3 | 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 20 |
| JIMMA | 7 | 10 | 3 | 4 | 1 | 1.5 | 1 | 1.5 | 1 | 1.5 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 13 |
| TOTAL* | 27 | 40 | 14 | 20 | 8 | 11.5 | 9 | 12.5 | 1 | 1.5 | 1 | 1.5 | 1 | 1.5 | 2 | 3 | 1 | 1.5 | 1 | 1.5 | 2 | 3 | 1 | 1.5 | 68 |

*DUE TO ROUNDING, ALL PERCENTAGE TOTALS DO NOT EQUAL 100

TABLE XI

PERCEPTIONS OF THE EXTENT TO WHICH SELECTED CURRENT PRACTICES
WERE AVAILABLE TO RESPONDENTS FOR EXTENSION ACTIVITIES

| Current Practices | Number of Subjects | Mean Extent Available | Standard Deviation |
|---|---|---|---|
| Library Resources | 62 | 2.66 | 1.01 |
| Lab and Field Facilities | 62 | 2.11 | 1.13 |
| Assigned Time for Extension | 58 | 1.79 | 1.01 |
| Support From Department Head | 60 | 3.40 | 1.11 |
| Support From Head of Institution | 61 | 3.13 | 1.24 |
| Professional Communications With Peers Out Side the Institution | 61 | 2.12 | 1.05 |
| Professional Communication With Peers Within the Institution | 61 | 3.00 | 1.23 |
| Consultation in Operational Strategies | 58 | 1.98 | 1.10 |
| Secretarial Services | 62 | 2.66 | 1.24 |
| Computer Services | 61 | 2.02 | 1.19 |
| Funds for Operations | 60 | 1.93 | 1.25 |

practices were available to educators for extension activities. Mean responses were calculated in order to provide a basis for interpreting the responses. Factors perceived to be available to a less than average extent (below 3.0 mean score) and their respective means are as follows: Assigned Time for Extension-1.79; Funds for Operations-1.93; Consultation in Operational Strategies- 1.98; Computer Services-2.02; Lab and Field Facilities-2.11; Professional Communications With Peers Out Side the Institutions- 2.12; Library Resources-2.66; Secretarial Services-2.66; Judged by the group to be available to an average extent was Professional Communication with Peers within the Institution-3.00; Support from Department Head was perceived to be available to the greatest extent as indicated by the mean response of 3.40 it received. The next highest rated factor in terms of availability was Support from Heads of the Institutions, which was assigned a 3.13 mean response.

Perceptions of the extent to which selected practices were available for research activity are summarized in Table XII. Three practices were felt to be available to researchers at levels above average. These, and their mean responses were as follows: Support from Department Head-3.72; Support from Head of Institution-3.45; and Professional Communication with Peers from within the Institution-3.32. In descending order of perceived availability were the following current practices: Assigned Time for Research - 2.70; Secretarial Services-2.64; Library Resources 2.48; Consultation in Research Proposal-2.31; Professional Communications with Peers Outside the Institution-2.29; Computer Services -2.15;

TABLE XII

PERCEPTIONS OF THE EXTENT TO WHICH SELECTED CURRENT PRACTICES
WERE AVAILABLE TO RESPONDENTS FOR RESEARCH ACTIVITIES

| Current Practices | Number of Respondents | Mean Extent Available | Standard Deviation |
|---|---|---|---|
| Library Resources | 62 | 2.48 | 1.10 |
| Lab and Field Facilities | 62 | 2.07 | 1.14 |
| Assigned Time for Research | 59 | 2.70 | 1.25 |
| Support From Department Head | 60 | 3.72 | 1.02 |
| Support From Head of Institution | 60 | 3.45 | 1.25 |
| Professional Communications With Peers Out Side the Institution | 62 | 2.29 | 1.14 |
| Professional Communication With Peers From Within the Institution | 62 | 3.32 | 1.02 |
| Consultation in Statistics | 58 | 1.78 | 1.08 |
| Consultation in Research Design | 60 | 1.87 | 1.08 |
| Consultation in Research Proposal | 59 | 2.31 | 2.21 |
| Secretarial Services | 61 | 2.64 | 2.15 |
| Computer Services | 61 | 2.15 | 2.21 |
| Funds for Operations | 59 | 2.12 | 1.18 |

Funds for Operations-2.12; Lab and Field Facilities-2.07;

Consultation in Research Design-1.87  and Consultation in

Statistics-1.78.

The combined perceived degrees of influence of the group of

selected current practices on the productivity of the respondents in

extension are presented in Table XIII. It should be noted that the

respondents felt all of the practices listed were of an above

average degree of influence upon what they were able to accomplish

in extension. The order of perceived influence of the practices as

determined by mean responses was found to be: Lab and Field

Facilities-3.92; Funds for Operation-3.90; Library Resources-3.74;

Professional Communications With Peers Outside the Institutions-

3.61; Professional Communications with Peers Within the

Institutions-3.56; Support from Head of Institutions--3.54;

Consultation in Operational Strategies--3.46; Support from

Department Head--3.45; Computer Services--3.43; Secretarial

Services--3.31, and Assigned Time for Extension--3.02.

Table XIV was structured to illustrate how the respondents felt

a list of selected practices impacted upon their achievement in the

research area. As was true for extension productivity, all of the

current practices were considered to have an above average

degree of bearing on what the respondents were able to achieve in

the research arena. Three of the practices were assigned rating

of 4.00 or above. These were Lab and Field Facilities, Funds for

Operations and Library Resources, whose respective mean influence

ratings were 4.18, 4.14 and 4.00. The remainder, arranged by the

TABLE XIII

PERCEIVED INFLUENCE OF SELECTED CURRENT PRACTICES ON
PRODUCTIVITY OF THE RESPONDENTS IN
EXTENSION ACTIVITIES

| Selected Practices | Number of Respondents | Mean Influence | SD | Rank |
|---|---|---|---|---|
| Lab and Field Facilities | 61 | 3.92 | 1.37 | 1 |
| Funds for Operations | 57 | 3.90 | 1.50 | 2 |
| Library Resources | 61 | 3.74 | 1.18 | 3 |
| Professional Communications With Peers Outside the Institution | 59 | 3.61 | 1.29 | 4 |
| Professional Communications With Peers Within the Institution | 59 | 3.56 | 1.32 | 5 |
| Support From Head of Institution | 59 | 3.54 | 1.44 | 6 |
| Consultation in Operational Strategies | 56 | 3.46 | 1.36 | 7 |
| Support From Department Head | 57 | 3.45 | 1.24 | 8 |
| Computer Services | 58 | 3.43 | 1.59 | 9 |
| Secretarial Services | 59 | 3.31 | 1.28 | 10 |
| Assigned Time for Extension | 58 | 3.02 | 1.41 | 11 |

TABLE XIV

PERCEIVED INFLUENCE OF SELECTED CURRENT PRACTICES ON THE
PRODUCTIVITY OF RESPONDENTS IN RESEARCH ACTIVITIES

| Current Practices | Number of Respondents | Mean Influence | SD | Rank |
|---|---|---|---|---|
| Lab and Field Facilities | 60 | 4.18 | 1.19 | 1 |
| Funds for Operations | 57 | 4.14 | 1.30 | 2 |
| Library Resources | 60 | 4.00 | 1.18 | 3 |
| Assigned Time for Research | 59 | 3.90 | 1.14 | 4 |
| Professional Communications With Peers From Outside of the Institution | 60 | 3.88 | 1.14 | 5 |
| Computer Services | 57 | 3.70 | 1.45 | 6 |
| Support From Head of Institution | 59 | 3.69 | 1.19 | 7 |
| Consultation in Research Proposal | 57 | 3.65 | 1.24 | 8 |
| Consultation in Research Design | 59 | 3.61 | 1.38 | 9 |
| Professional Communications With Peers Within the Institution | 61 | 3.60 | 1.08 | 10 |
| Consultation in Statistics | 58 | 3.59 | 1.35 | 11 |
| Support From Department Head | 59 | 3.58 | 1.09 | 12 |
| Secretarial Services | 58 | 3.38 | 1.24 | 13 |

level of mean influence rating were: Assigned Time for Research-3.90; Professional Communications with Peers from Outside the Institutions-3.88; Computer Services-3.70; Support from Head of Institutions-3.69; Consultation in Research Proposal-3.65; Consultation in Research Design-3.61; Professional Communications with Peers within the Institutions-3.60; Consultation in Statistics-3.59; Support from Department Head-3.58; and Secretarial Services-3.38. As a group, these current practices were considered to have a higher degree on influence on research productivity than was true for the impact of the comparable group of practices on extension productivity.

Problems Impacting on Effectiveness
of Extension and Research

A determination of the extent to which selected factors were problematic to the effectiveness of research and extension was another concern of the study. Tables XV and XVI contain the findings collected in this regard. Respondents indicated their perceptions of problems presented by each factor on a five-point continuum ranging from one, "Not a Problem at All", to five, "A Serious Problem". Number three, which was the middle point, was considered to be the neutral point indicating an item "May or May Not be a Problem".

The extent to which the selected factors were problems to the effectiveness of extension are indicated in Table XV. In this table, ten out of the 11 selected factors, about 90%, were perceived as presenting problems to the effectiveness of

TABLE XV

COMBINED PERCEPTIONS OF THE EXTENT TO WHICH SELECTED FACTORS WERE
PROBLEMS TO THE EFFECTIVENESS OF EXTENSION IN THE SELECTED
AGRICULTURAL HIGHER EDUCATION INSTITUTIONS

| Selected Factors | Number of Respondents | Mean Extent of Prob. | SD | Rank |
|---|---|---|---|---|
| Incentive for Work Done | 60 | 4.45 | 1.03 | 1 |
| Availability of Experienced Senior Staff | 57 | 4.42 | 1.03 | 2 |
| Lack of Clear Policy Objectives | 56 | 4.09 | 1.12 | 3 |
| Lack of Continuity of Programs | 65 | 4.07 | 1.11 | 4 |
| Lack of Appropriate Organization and Coordination | 62 | 4.05 | 1.12 | 5 |
| Failure to Provide Educational Programs for the Staff | 60 | 3.95 | 1.13 | 6 |
| Failure to Provide Balanced Allocation of Limited Resources | 59 | 3.86 | 1.01 | 7 |
| Availability of Appropriate Technology to Extend to Farmers | 60 | 3.78 | 1.27 | 8 |
| Working with the National Research Institute | 57 | 3.69 | 1.29 | 9 |
| Lack of Well Defined Territorial Mandate for Operations | 58 | 3.67 | 1.36 | 10 |
| Publishing Field Results | 56 | 3.63 | 1.29 | 11 |
| Working with Ministry of Agriculture | 58 | 3.57 | 1.29 | 12 |
| Lack of General Understanding and Appreciation of the Role of Extension in Rural Development | 59 | 2.93 | 1.54 | 13 |

extension. The following three variables received the highest ratings and thus were perceived to be the top three problems to the effectiveness of extension: Incentives for Work Done; Availability of Experienced Senior Staff; and Lack of Clear Policy Objectives. Respective mean responses were 4.45, 4.42 and 4.09. The other problem areas in their rank order were: Lack of Continuity of Programs-4.07; Lack of Appropriate Organization and Coordination-4.05; Failure to Provide Educational Programs for the Staff 3.95; Failure to Provide an Effective Balance in the Allocation of Limited Resources-3.86; Availability of Appropriate Technology to Extend to Farmers-3.78; working with the National Research Institution-3.69; Lack of Well Defined Territorial Mandate-3.67; Publishing Field Results-3.63; and Working with the Ministry of Agriculture-3.57. The only factor rated at below the neutral level was Lack of Understanding and Appreciation of the Role of Extension in Rural Development-2.93.

Similarly, Table XVI contains a summary of perceptions regarding the same variables impacting and the extent to which they present problems to the effectiveness of research in institutions selected for this study. The result was that the problems impacting the effectiveness of extension were also problems to research. Rank ordering of these variable indicated that Incentives for Work Done; Availability of Experienced Senior Staff; and Publishing Field and Lab Word Results were the top three variables perceived as impacting in a problematic manner the effectiveness of research with respective means of 4.34;

TABLE XVI

COMBINED PERCEPTIONS OF EXTENT TO WHICH SELECTED FACTORS WERE
PROBLEMS TO THE EFFECTIVENESS OF RESEARCH IN THE SELECTED
AGRICULTURAL HIGHER EDUCATION INSTITUTIONS

| Selected Factors | Number of Respondents | Mean Extent of Prob. | SD | Rank |
|---|---|---|---|---|
| Incentive for Work Done | 51 | 4.34 | 1.33 | 1 |
| Availability of Senior Staff | 62 | 4.16 | 1.20 | 2 |
| Publishing Field and Lab Results | 62 | 3.86 | 1.28 | 3 |
| Failure to Provide Educational Programs for the Staff | 65 | 3.82 | 1.17 | 4 |
| Failure to Provide Balanced Allocation of Limited Resources | 65 | 3.74 | 1.14 | 5 |
| Lack of Clear Policy Objectives | 61 | 3.66 | 1.37 | 6 |
| Lack of Appropriate Organization and Coordination | 66 | 3.53 | 1.42 | 7 |
| Working with the Ministry of Agriculture | 61 | 3.50 | 1.39 | 8 |
| Working With the National Agricultural Research Institute | 62 | 3.48 | 1.40 | 9 |
| Lack of Continuity of Programs | 63 | 3.46 | 1.34 | 10 |
| Lack of Well Defined Territorial Mandate for Operation | 63 | 3.46 | 1.33 | 10 |
| Lack of General Understanding and Appreciation of the Role of Research in Rural Development | 61 | 2.29 | 1.15 | 12 |

4.16, and 3.86. Other factors felt to be negatively impacting the effectiveness of research activities were: Failure to Provide Educational Programs for the Staff-3.82; Failure to Provide Balanced Allocation of Resources-3.74; Lack of Clear Policy Objectives-3.66; Lack of Appropriate Organization and Coordination-3.53; Working with the Ministry of Agriculture-3.50; Working with the National Agricultural Research Institute-3.48; Lack of Continuity of Programs-3.46; Lack of well Defined Territorial Mandate for Operations-3.46. Lack of General Understanding and Appreciation of the Role of Research in Rural Development with a 2.29 mean response was perceived as being not a problem.

The overall level of satisfaction of the respondents regarding current practices in research and extension in their institutions is depicted in Table XVII. Data in this table indicate that the respondents were dissatisfied with the research and extension activities in their institutions. They were more dissatisfied with extension activities than research as indicated by the respective means of 1.97 and 2.49.

The Organization of Research

and Extension

Table XVIII contains a listing of six selected factors that were felt to contribute to setting research priorities in the Agricultural Higher Education Institutions in Ethiopia, and the manner in which these factors were rank ordered by the respondents. The mean rank value

TABLE XVII

THE OVERALL OPINION AND EVALUATION OF THE RESPONDENTS
WITH REGARD TO CURRENT PRACTICES IN THE AREAS
OF RESEARCH AND EXTENSION ACTIVITIES

| Area of Activity | Number of Respondents | Mean | SD | Description |
|---|---|---|---|---|
| Research | 67 | 2.49 | 1.17 | Dissatisfied |
| Extension | 63 | 1.97 | .99 | Dissatisfied |

TABLE XVIII

PERCEIVED RANK ORDER OF SELECTED FACTORS TO BE CONSIDERED
FOR SETTING RESEARCH PRIORITIES IN THE SELECTED
AGRICULTURAL HIGHER EDUCATION INSTITUTIONS

| Selected Factors | Mean Rank | SD | Overall Rank |
|---|---|---|---|
| Research Needs With Impact on National Economy and Income of the Rural Population | 2.19 | 1.34 | 1 |
| The Target Group Which is Intended to Make Use of the New Technology | 2.66 | 1.51 | 2 |
| The Agro-ecological Zones For Urgent Need of Improved Technology | 2.93 | 1.35 | 3 |
| Insure Limited Resources Not to be Spread Over Too Many Activities | 3.86 | 1.40 | 4 |
| Insure Economic Value of the Proposed New Technology | 4.02 | 1.43 | 5 |
| Consider technologies Tested Outside of the Country Rather Than Attempting to Develop New Technologies | 5.26 | 1.26 | 6 |

for each factor was obtained by adding the rank values given by each

respondent and dividing the total sum of these by the number of

respondents who participated in ranking the priority factors. The

top three factors in the ranking list were: Research Needs with

Impact of National Economy and Income of the Rural Population;

the Target Group which is Intended to Make Use of the New

Technology; the Agro-ecological Zones for Urgent need of Improved

Technology; with mean values of 2.19, 2.99 and 2.93 respectively.

The other three factors in their rank order were: Insure Limited

resources not to be spread over too Many Activities-3.86;

Insure the Economic Value of the Proposed New Technology-4.02;

and Consider Technologies Tested Outside of the Country Rather

than Attempting to Develop New Technology-5.26.

Table XIX is a summary of the respondents' opinions as to

who should determine research priorities in the Agricultural

Higher Education Institutions. Forty of the 67 respondents, that

is, 60% of the total, were of the opinion that "A Group or Council

Within the Institutions" should decide on research priorities. "A

National Council" was the choice of another 15, that is, 22% of the

respondents, and "The Research Coordinator/Director" was preferred

by 10, that is, 15% of the respondents.

Research and extension administration was one of the

important organizational issues that this study sought to

address. As one means of addressing this, the perceptions of the

respondents were recorded to determine how they felt research and

TABLE XIX

DISTRIBUTION OF RESPONDENTS AS TO OPINIONS OF WHO SHOULD
DETERMINE RESEARCH PRIORITIES IN
THE RESPECTIVE INSTITUTIONS

| Priority Setting Body | Number of Respondents | Percent |
|---|---|---|
| The Research Coordinator or Director | 10 | 15 |
| Head of the Institution | 0 | 0 |
| A National Council | 15 | 22 |
| A Group or Council Within the Institution | 40 | 60 |
| Others (the Researcher, Office of the Higher Education, etc.) | 2 | 3 |
| Total | 67 | 100 |

extension should be coordinated in the Agricultural Higher Education Institutions.

Table XX is a summary of responses as to whether research and extension should be coordinated by the same or separate office. Forty of the 66 respondents, or 61% wanted research and extension to be coordinated by the same coordinator or director, while 26, 39%, felt separate coordinators or directors was the better approach.

When the respondents were requested to forward their suggestions as to what percent of the institutional budget should be allocated for research, extension, and other duties including teaching, the results depicted in Table XXI were obtained. The respondents suggested that the bulk of the institutional budget, that is 54% was be assigned for teaching and other duties, with 29% being set aside for research and the remaining 17% for extension.

Table XXII is a summary of the levels of agreement of the respondents on some selected research and extension organizational issues. The mean level of agreement was used to arrange the issues in order in the table. The issue with which respondents expressed the highest level of agreement, 4.44 (Agree) was: The Teaching Staff Should Participate in Research and Extension Activities-4.44 (Agree); They also responded at the Agree level (4.28) that Regional Agricultural Colleges/Universities with Research and Extension Included in Their Educational Objectives should be established. Also drawing

TABLE XX

PERCEPTIONS OF RESPONDENTS AS TO HOW RESEARCH AND EXTENSION
SHOULD BE COORDINATED IN THEIR RESPECTIVE INSTITUTIONS

| Coordination Mechanism | Number of Respondents | Percent |
|---|---|---|
| By the Same Coordinator or Director | 40 | 61 |
| By Separate Coordinators or Directors | 26 | 39 |
| Total | 66 | 100 |

TABLE XXI

PERCEPTIONS AS TO PERCENTAGE OF INSTITUTIONAL BUDGET TO BE
ALLOCATED FOR TEACHING AND OTHER DUTIES,
RESEARCH, AND  EXTENSION AS PERCEIVED
BY ALL RESPONDENTS COMBINED

| Activity Area | Percentage of Institutional Budget |
|---|---|
| Research | 29 |
| Extension | 17 |
| Other Duties (Including Teaching) | 54 |
| Total | 100 |

TABLE XXII

RESPONDENTS' LEVELS OF AGREEMENT WITH SOME SELECTED RESEARCH
AND EXTENSION ORGANIZATIONAL ISSUES

| Organizational Issues | Number of Respondents | Mean Levels of Agreement | SD |
|---|---|---|---|
| The Teaching Staff Should Participate in Research and Extension Activities to Some Extent | 68 | 4.44 Agree | 0.76 |
| Regional Agricultural Colleges or Universities With Research and Extension Included in Their Educational Objectives Should be Established | 68 | 4.28 Agree | 0.94 |
| Institutions Should Focus More on Regional Research and Extension Problems | 66 | 3.78 Agree | 1.18 |
| Institutions Should Have Full-time Extension Subject Matter Specialists | 68 | 3.60 Agree | 1.19 |
| Institutions Should have Full-time Researchers With Part-time Extension and Other Duties as Required | 67 | 3.34 Neutral | 1.30 |

mean response of Agree were Institutions Should Focus more
on Regional Research and Extension Activities Problems and
Institutions Should Have Full-Time Extension Subject Matter
Specialists. Numerical mean responses to these were 3.70 and 3.60.
A mean response of Neutral (3.34) was assigned to the issue,
Institutions Should Have Full-Time Researchers with Part-Time
Extension and Other Duties as required.

Table XXIII was constructed to summarize respondents'
perceptions regarding some preferred functions of research and
extension in the Agricultural Higher Education Institutions in
Ethiopia. The respective mean values were used to indicate the
levels of agreement of the respondents. In regard to the
functions of research, the respondents expressed a Strongly Agree
view with the Establishment of Linkages with National and
International Research Centers, Conduct of Interdisciplinary
Applied Research on Stations of Major Agro-Climatic Zones, and
Conduct Basic Applied Research on Main Campus. The respective
mean responses were 4.71, 4.60 and 4.57. The respondents agreed
that research should Tackl Location Specific Problems and the
Evaluation of Varieties or Techniques on Sub-Stations with a mean
response response of 4.33.

As to the functions of extension, the respondents agreed
that Training of Trainers (Development Agents, Teachers of
Farmers Training Centers etc.), Offering Specialized Service
Through Extension Subject Matter Specialists from the Respective
Academic Departments, and Performing Farm Advisory Functions at

TABLE XXIII

RESPONDENT'S EXTENT OF AGREEMENT WITH PREFERRED FUNCTIONS OF
RESEARCH AND EXTENSION IN THE AGRICULTURAL HIGHER
EDUCATION INSTITUTIONS

| Functions | Number of Respondents | Mean Levels of Agreement | | SD |
|---|---|---|---|---|
| **Preferred Functions of Research:** | | | | |
| Conduct Basic and Applied Research on Main Campus | 67 | 4.60 | Stronly Agree | 0.95 |
| Conduct Inter-disciplinary Applied Research on Stations of Major Agro-Climatic Zones | 67 | 4.57 | Stronly Agree | 0.68 |
| Tackle Location Specific Problems and the Evaluation of Varieties or Techniques on Sub-Stations | 66 | 4.33 | Agree | 0.75 |
| Establish Direct Linkages With National and International Research Centers | 68 | 4.71 | Strongly Agree | 0.49 |
| **Preferred Functions of Extension:** | | | | |
| Training of Trainers (Development Agents, Teachers of Farmers Training Centers) | 67 | 4.33 | Agree | 0.81 |
| Farm Advisory Functions at Farm or Community Levels | 66 | 3.91 | Agree | 0.98 |
| Offering Specialized Services Through Extension Subject Matter Specialists From the Respective Academic Departments | 67 | 4.10 | Agree | 0.82 |

Farm or Community Levels should be the functions of extension

with mean values of 4.30, 3.91, and 4.10 respectively.

Table XXIV was developed to depict the actual and preferred

percentages of time distribution for teaching, research and

extension by the respondents. The percentage values were

obtained by summing the percentage scores supplied by each

individual for each category, and dividing the total sum by the

number of observations (respondents) of that particular category.

In this regard, on the average the respondents actually spend 72%

of their time on teaching, 21% on research, and 7% on extension.

However, if given the choice, on the average, they would like to

spend 43% on teaching, 38% on research, and 19% on extension.

Operational Strategies to Link

Research and Extension

Table XXV was constructed to illustrate the extent of agreement

among the respondents regarding selected functional and

organizational ideas as they could contribute to link research and

extension in the Agricultural Higher Education Institutions. The

following results were obtained when the mean levels of agreement of

respondents on the selected variables were computed: The Use of

Integrated On-farm Research and Extension Approaches-4.61

(Strongly Agree); Linkage with Other Organizations of Similar

Interest-4.51 (Strongly Agree); Interdepartmental Joint Research

and Extension Programs (Farming Systems Research)-4.49 (Agree);

The Overall Integrated Functioning of Teaching, Research and

TABLE XXIV

ACTUAL AND PREFERRED PERCENTAGE TIME ALLOCATION
AMONG TEACHING, RESEARCH, AND
EXTENSION BY THE RESPONDENTS

| Area of Activity | Percentage Mean Time Allocation | |
| --- | --- | --- |
| | Actual (N=60) | Preferred (N=66) |
| Teaching | 72 | 43 |
| Research | 21 | 38 |
| Extension | 7 | 19 |
| Total | 100 | 100 |

TABLE XXV

LEVELS OF AGREEMENT OF RESPONDENTS AS TO IDEAS FOR
OPERATIONAL STRATEGIES TO LINK
RESEARCH AND EXTENSION

| Operational Strategies | Number of Respondents | Mean Level of Agreement | | SD |
|---|---|---|---|---|
| The Use of Integrated On-Farm Research and Extension Approaches | 67 | 4.61 | Strongly Agree | 0.55 |
| Linkage With Other Organizations of Similar Interest | 67 | 4.51 | Strongly Agree | 0.56 |
| Interdepartmental Joint Research and Extension Programs (Farming Systems Approach) | 67 | 4.49 | Agree | 0.61 |
| The Overall Integrated Functioning of Teaching, Research and Extension | 67 | 4.42 | Agree | 0.72 |
| The Use of University/College Research and Extension Advisory Council | 67 | 4.22 | Agree | 0.71 |
| The Use of National and Regional Scientific Panels | 67 | 4.15 | Agree | 0.97 |
| The Use of a Regional Committee Consisting of Related Organizations of Research and Extension | 67 | 4.09 | Agree | 0.81 |
| The Use of a Training and Visit Extension Approach | 65 | 3.95 | Agree | 0.94 |

Extension-4.42 (Agree); The Use of University/College Research

and Extension Advisory Council-4.22 (Agree); The Use of National

and Regional Scientific Panels-4.15 (Agree); The Use of a Regional

Committee Consisting of Related of Organizations of Research and

extension-4.09 (Agree); and The Use of the Training and Visit

Extension Approach-3.95 (Agree).

## The Roles of the National Research,
## Extension and Higher Education
## Systems

Table XXVI contains a summary of the extent to which the

respondents agreed regarding desired roles which should be fulfilled

by the National Research, Extension, and Higher Education Systems

pertaining to research and extension activities of the Agricultural

Higher Education Institutions.  Mean responses of Strongly Agree

were determined for the assertion that the National Research System,

"Should Allow the Participation of Agricultural Colleges and

Universities in Research Planning Panels at National and Regional

Levels" and "Cooperate and Support Graduate Research Projects". The

respective mean responses were 4.55 and 4.54. They expressed an

Agree that the Research System should, "Strengthen the Research

Capabilities of Agricultural Universities and Colleges by

Sponsoring Need-Based Research (Contract Research)" as determined

by the 4.35 mean response. Programs receiving 4.27 mean responses

each were the statements that the system should, "Call for Joint

TABLE XXVI

LEVELS OF AGREEMENT OF RESPONDENTS AS TO DESIRED ROLES OF THE
NATIONAL AGRICULTURAL RESEARCH, EXTENSION, AND HIGHER
EDUCATION SYSTEMS IN THE RESEARCH AND EXTENSION
ACTIVITIES OF THE AGRICULTURAL
COLLEGES AND UNIVERSITIES

| Desired Roles (Functions) | Number of Respondents | Mean Response | | SD |
|---|---|---|---|---|
| Roles of the National Agricultural Research System: | | | | |
| Strengthen the Research Capabilities of Agricultural Universities and Colleges by Sponsoring Need-based Research Programs (Contract Research) | 65 | 4.35 | Agree | 0.86 |
| Call for Joint Research Identification With the Agricultural Higher Education Institutions | 65 | 4.27 | Agree | 1.02 |
| Sponsor scientific panels | 67 | 4.27 | Agree | 0.77 |
| Allow the Participation of Agricultural Universities and Colleges in the Research Planning Panes at National and Regional Levels | 67 | 4.55 | Strongly Agree | 0.68 |
| Cooperate and Support Graduate Research Projects Research Projects. | 67 | 4.54 | Sgrongly Agree | 0.68 |
| Roles of the National Extension System: | | | | |
| Sponsor Training Programs Organized by Agricultural Colleges/Universities for its Extension Staff | 66 | 4.49 | Agree | 0.66 |
| Encourage Agricultural Universities/Colleges to Carry out Farm Advisory Functions While it Does the Input Distribution Function | 66 | 4.17 | Agree | 0.89 |
| Roles of the national higher Education System: | | | | |
| Coordinate Inter-College/University Research and Extension Efforts | 66 | 4.18 | Agree | 0.89 |
| Coordinate the National Budget University/College Research and Extension Activities | 67 | 3.70 | Agree | 1.13 |
| Implement National Policies on Agricultural Research and Extension At University/College Levels | 76 | 3.56 | Agree | 1.13 |

Research Identification with the Higher Education Institutions",
and "Sponsor Scientific Panels". Both of these were translated to
Agree responses.

With reference to the National Extension System, respondents
indicated a very Strongly Agre (4.49) that this entity should
"Sponsor Training Programs Organized by Agricultural Colleges and
Universities for its Extension Staff". Their mean response was
Agree, 4.17, that the system should "Encourage Agricultural
Universities and Colleges to Carry out Farm Advisory Functions
While it Does the Input Distribution Functions for the Farmers".
In terms of the desired roles of the National Higher Education
System, an Agree (4.18) response was obtained for the statement
that this group should, "Coordinate Inter-College/University
Research and Extension Efforts". A 3.70 mean response, Agree was
expressed for the belief that Higher Education should,
"Coordinate the National Budget for University/College Research
and Extension Activities". A 3.56 mean response was obtained for
the statement that this system should "Implement National Policies
on Agricultural Research and Extension at College and University
Levels."

Comments and Suggestion by
the Respondents

This part of the findings deal with views and suggestions
provided by the respondents on the open-ended parts of the
instrument. A number of issues were raised by the respondents.

However, for the most part these views and suggestions focused on the research and extension current practices and problems. The following sections provide the researcher' summary of these as well as some specific quotes from respondents.

### Current Practices and Problems to the Effectiveness of Research.

Research problem identification, availability and distribution of funds, coordination and organization of research, research policy problems, facilities and logistics, and miscellaneous views and suggestion were the major points addressed by the respondents. Research problem identification and prioritization was the most important concern of the respondents.

Twenty-five percent (25%) of the total counted views and suggestions regarding current practices and problems of research focused upon the identification and prioritization of research problems. Some specific views and suggestions, paraphrased by the researcher included:

- The prioritization of research has not been critically evaluated in terms of regional and national issues.

- Research should focus on the problems of farmers. Current farmers immediate needs were not addressed.

- Research activities were generated from the wishes of the individuals without the involvement of the users.

- Research problem identification was the major problem in the field of research.

- Research should be area specific oriented to regional problems.

- Current research activities were highly basic in character focused on national issues, ignoring local farmer problems.

- Research problem identification should start from the lively-hood of the farmers

Availability and distribution of funds was the second most important concern of the respondents in this category. The views and suggestions included:

- Research suffered from inadequate fund.

- There was a problem in the distribution of the available fund approved by the annual research review meetings.

- Lots of bureaucracy in obtaining and effectively utilizing funds.

The issue of coordination and organization of research was ranked third in the list. The major concerns of the respondents included:

- Inefficiency in the coordination of research at national level to avoid redundancy.

- Inefficiency in the coordination of research and integrated approach to research problems, and lack of research follow-up at institutional levels.

- The different fields (disciplines) were not addressed equally.

- Research should be well organized and restructured.

The suggestions in the research policy problems included:

- Redefining policy objectives and strategies was necessary.

- There was no research policy or accountability in research works.

- Research was not appreciated by policy makers, rather it was considered a personal benefit.

The views and suggestions concerning research facilities and logistics included:

- Shortage of research materials for designing and executing research works.

- Lack of lab and field facilities.

Miscellaneous types of issues were also suggested in this category. The major ones included:

- Incentives for work done, both moral and material.

- Inadequate qualified manpower on certain fields.

- Lack of exposure to the farming community by the researchers.

- Designing appropriate research strategy and techniques, and encourage linkages with extension.

- Avoiding academic isolation.

Current Practices and Problems to the Effectiveness of Extension. The following areas were the top six views and suggestions by the respondents in order of their frequency of occurrence regarding current practices and problems in extension:

Organization and coordination; funds for operations, operational strategies, policy orientations, incentives, motivation and working atmosphere; and availability of appropriate technology.

The views and suggestions in the organization and coordination of extension included:

- Poor organizational structure, lack of coordination and integrated approach to problems.

- Improper organization and mandate.

- Much work is needed in the organization and control of extension activities.

- Extension did not exist in its true sense and purpose; it needs to be worked out in terms of organizational structure and its linkage with research.

- Poor cooperation among related institutions.

The suggestions concerning funds for operations included:

- Extension was not effective due to budget constraints and budget administration.

The suggestions and views regarding operational strategies

included:

- There should be appropriate mechanism to link researchers with the farmers.

- Most extension activities lack continuity and follow ups.

- There is a wide gap between researchers and extension workers to address the problems of the farmers.

- Problem identification should start from the users, and extension workers should be free from political assignments.

- A great many of the academic staff are neither consulted nor directly involved in extension.

The issues in extension policy included:

- Extension was not considered a noble activity as research.

- No clear extension objectives.

- Lack of government initiation of extension works.

- Extension workers should be free from political assignment.

- Staff lack commitment to render consistent extension services.

The issues concerning incentives, and motivation and

appropriate working conditions included:

- Lack of motivation and security

- No incentives for extension workers.

- Allow conducive working conditions for extension agents.

- Assign staff according to interest.

The views and suggestions concerning the availability of appropriate technology included:

- Rendered technology not readily accepted by farmers.

- In appropriate technology extended to farmers in most cases.

- Lack of researched technology to be communicated with farmers.

A number of views and suggestions regarding the organization and operational strategies research and extension, and on the roles of the Research, Extension, and Higher Education Institutions were forwarded. Many of the views and suggestions were similar to those presented in the previous sections of the study. Therefore, to avoid redundancy in presentation, they are not repeated in this section. However, the following few suggestions were repeatedly expressed by the respondents:

- There should be an active body (liaison) between research and extension that takes full responsibility to link research and extension.

- Enhance positive outlook of extension, and good problem identification approach both in extension and in research.

- Allow the teaching staff to devote more on research and extension with explicit terms of reference.

- Use inspiring leadership.

- Use the experiences of other countries.

- The functions of the National Research System should include Cooperation and support in publishing research results completed by the agricultural Colleges and Universities; provide information on research priorities for national objectives versus farmers felt needs.

- The functions of the National Higher Education System should include establishing a "Research and Extension Council" at a national level; and sponsor scientific panels to research and extension staff primarily from the agricultural colleges and universities to allow them to exchange research and extension experiences.

CHAPTER V

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

The purpose of this chapter is to present a summary of the problem, purpose, objectives, methodology and major findings of the study and finally, to draw conclusions and make recommendations.

## Summary

### Statement of the Problem

The research and extension sub-systems in the Ethiopian Agricultural Higher Education Institutions failed to effectively generate and disseminate new agricultural technologies to bring significant economic, social and cultural impacts on the rural communities in the country.

### Purpose of the Study

The purpose of the research was to study the organization and operational strategies to link research and extension in the Agricultural Higher Education Institutions in Ethiopia, based on the perceptions of the faculty and extension field staff in those institutions, and suggest recommendations for improvement of research and extension activities.

<u>Objectives of the Study</u>

The following objectives were formulated in order to accomplish the purpose of the study.

1. To determine the demographic characteristics of the respondents.

2. To determine perceptions of the faculty with regard to the availability of selected current practices to educators and the influence they have on productivity in both research and extension activities.

3. To ascertain perceptions as to the extent to which selected problems impact upon the effectiveness of research and extension in the Agricultural Higher Education Institutions.

4. To determine appropriate research and extension organizational mechanisms as viewed by those currently engaged in such programs.

5. To determine practitioners' perceptions of operational strategies to promote the linkage between research and extension.

6. To determine perceptions of the roles of the National Research, Extension, and Higher Education Systems in the promotion of research and extension.

7. To make comparison across institutions of perceptions associated with the selected variables studied.

<u>Methodology</u>

A descriptive research method was used for the collection and analysis of the data required for the study. The survey method using

a questionnaire was used to collect the data.

The population of the study consisted of all faculty with Masters' degree and above, and the extension field staff regardless of academic qualifications in the Agricultural Higher Education Institutions conducting an integrated system of teaching, research and extension from each of the different agro-ecological zones of the country. This included the Alemaya University of Agriculture, the Awassa College of Agriculture, and the Jimma Junior College of Agriculture. The total population was 93 out of which 68 or 73% responded to the survey questionnaire.

After the instrument was developed, utilizing a variety of formats, a pilot test was conducted using graduate students from the agricultural university and colleges from Ethiopia currently studying in Oklahoma State University. The instrument was further checked for its content validity and internal consistency. A senior faculty from the Alemaya University of Agriculture was identified to distribute and collect the instrument in the institutions identified for the study.

The data were analyzed using descriptive statistics such as frequencies, percentages, means, and standard deviations. In addition the Kruskal-Wallis one-way analysis of variance was used to make comparison across the institutions for selected variables.

## Findings of the Study

### Demographic Characteristics of the Respondents. The gender classification of the respondents indicated that 94% were males and

only 6% were females. The age profile showed a range between 26 and

55, with an average age of 35. The majority of the respondents above

the average age were from the Alemaya. Of the total respondents, 75%

were lecturers, 21% Assistant Professors, and 4% were Associate

Professors. All the Associate Professors and 77% of the Assistant

Professors belong to the Alemaya University of Agriculture. The

Jimma Junior College of Agriculture had no faculty at these career

stages. Three percent of the respondents hold less

than the Masters degree, 77% hold the Masters degree, and 20% the

Doctorate degree. Eight-seven percent of respondents holding the

Doctorate degree belong to the Alemaya University of Agriculture.

The Jimma Junior College of Agriculture had no faculty at this level

academic qualification. It was also determined that 91% of all the

respondents received their highest degree less ten years prior to

the survey, and the rest 9% between 11 and 25 years. The majority of

the respondents had six to ten years of service in their present

institutions. About 41% did not participate in any type of research

project, and the rest 59% participated in as many as 32 research

projects on individual basis. The finding was similar to those who

completed research projects.

Availability of Selected Current Practices and Their
Influence on the Productivity of the Educators in Both Research
and Extensions Activities. For extension activities, Assigned

Time, Fund for Extension, Consultation in Operational Strategies,

Computer Services, Lab and Field Facilities, Professional

Communications With Peers Outside the Institutions, were perceived to be available to a less than average extent. However, Library Resources, Secretarial Services, Professional Communications With Peers Within the Institutions, Support From Department Heads, and Heads of Institutions were judged by the group to be available to an average extent. The latter two practices were perceived to be available at the highest level.

A similar result was obtained for the availability of current practices for research activities except that "Support From Department Heads for Research" was felt available to researchers at levels above average. "Assigned Time" and "Support From Heads of Institutions" were felt by the respondents to be more available for research than for extension.

The respondents felt that all of the current practices listed were of an above average degree of influence upon their productivity in extension. The order of perceived influence was found to be: Lab and Field Facilities, Funds for Operation, Library Resources, Professional Communications with Peers Within the Institutions, Support from Head of Institutions, Consultation in Operational Strategies, Support from Department Heads, Computer Services, and Secretarial Services.

As was true for extension productivity, all of the current practices were considered to have an above average degree of bearing on what the respondents were able to achieve in the research area. However, these current practices were considered to have a higher degree of influence on research productivity

than was true for the impact of the comparable group of practices on extension productivity.

Problems Impacting Upon the Effectiveness of Research and Extension. Incentive for Work Done; Availability of Experienced Senior Staff; and Lack of Clear Policy Objectives; Lack of Continuity of Programs; Lack of Appropriate Organization and Coordination, in that order, were perceived as presenting the greatest problem to the effectiveness of extension. These received mean ratings ranging from 4.45 to 4.05 on a 5 point scale. Failure to Provide Educational Programs for the Staff; Failure to Provide a Balanced Allocation of Limited Resources; Availability of Appropriate Technology to Extend to Farmers; Working With the National Research Institute; Lack Well Defined Territorial Mandate for Extension; Publishing Field Results; and Working with the Ministry of Agriculture; were the next highest rated problems, receiving ratings ranging from 3.95 to 3.57. Lack of General Understanding and Appreciation of the Role of Extension in Rural Development was the lowest rated at 2.93.

Similarly, Incentive for Work Done; Availability of Senior Staff; and Publishing Field and Lab Results were rated the top three problems impacting the effectiveness of research, and received ratings 4.34, 4.16.and 3.86 respectively. Failure to Provide Educational Programs for the Staff; Failure to Provide Balanced Allocation of Limited Resources; Lack of Clear Policy Objectives; Lack of Appropriate Organization and Coordination; and Working With the Ministry of Agriculture were found to be the

next highest rated problems, with perceived mean responses of 3.82, 3.74, 3.66, 3.53, and 3.50 respectively. Factors grouped near the "Average" or "Neutral" category were Working with the National Agricultural Research Institute; Lack of Continuity of Programs; and Lack of Well Defined Territorial Mandate for Operation, and received ratings 3.48, 3.46, and 3.46 respectively. The lowest rated factor at 2.29, below the average point, was Lack of Understanding and Appreciation of the Role of Research in Rural Development.

The respondents overall were dissatisfied in their opinion and evaluation of current practices for both research and extension activities in their institutions. They were more dissatisfied with extension activities than research.

The Organization of Research and Extension. Research Needs with Impact on National Economy and Income of the Rural People; the Target Group Which is Intended to Make Use of the New Technology; and the Agro-ecological Zones for Urgent Need of Improved Technology ranked as the top three factors to be considered in research prioritization in the Agricultural Higher Education Institutions. Almost two-third of the respondents suggested a "Group of Council Within the Institutions" should determine the research priorities. About the same proportion felt research and extension should be coordinated by the "Coordinator/ Director." The respondents also suggested that 29% of the institutional budget be allocated for Research, 17% for Extension, and the rest, 54% for Teaching and Other Duties.

With respect to organizational issues, respondents expressed that the Teaching Staff should Participate in Research and Extension Activities, Regional Agricultural Colleges or Universities With Research and Extension Included in Their Educational Objectives Should be Established, Institutions Should focus on Regional Research and Extension Problems, and Institutions Should Have Full-time Extension Subject Matter Specialists. The order of magnitude of mean responses to these issues was as they are listed. The respondents were Neutral to the issue that Institutions Should have Full-time Research with Part-time Extension and Other Duties as Required.

Respondents, if given the choice, would like to spend 38% of their time on Research, 19% on Extension and 43% on Teaching. Their actual time allocations were 21%, 7% and 72% for Research, Extension, and Teaching respectively.

Based upon the levels of mean responses, respondents expressed the preference that functions of research in Agricultural Higher Education Institutions should be to Establish Direct Links With National and International Research Centers, Conduct Basic and Applied Research on Main Campus, Conduct Inter-disciplinary Applied Research on Stations of Major Agro-climatic Zones, and Tackle Location-Specific Problems and the Evaluation of Varieties or Techniques on Sub-Stations. The three former preferred functions received Strongly Agree Ratings, with the latter receiving an Agree.

The preferred functions for extension, arranged by levels of mean response were: Training of Trainers (Development Agents,

Teachers of Farmers Training Centers), Offering Specialized
Services Through Extension Subject Matter Specialists from the
Respective Academic Departments, and Farm Advisory Functions at
Farm or Community levels. Each of these proposed functions drew
Agree responses on the average.

Operational Strategies to Link Research and Extension. The
respondents strongly agreed on the Use of On-farm Research and
Extension Approaches, and on the Linkage With other Institutions
of Similar interests as Operational Strategies to Link Research
and Extension. They indicated Agree on Inter-departmental Joint
Research and Extension Programs (Farming Systems Research). The
Overall Integrated Functioning of Teaching, Research and
Extension; The Use of University/College Research and Extension
Advisory Council; The Use of National and Regional Scientific
Panels; The  Use of Regional Committees Consisting of Related
Organizations of Research and Extension; and The Use of a
Training and Visit Extension Approach. These strategies are
listed in the order of their mean ratings.

Desired Roles of the National Research, Extension and Higher
Education Systems on the Development of Campus Research and
Extension Programs. The respondents strongly agreed that as
desired roles, the National Research System should Allow
Participation of Agricultural Colleges and Universities in
Research Planning Panels at National and Regional Levels; and
Cooperate and Support Graduate Research Projects. They responded

at the Agree level that the National Research System should

Strengthen the Research Capabilities of the Agricultural

Universities and Colleges by Sponsoring Need-Based Research

Programs, Call for Joint Research Identification with the

Agricultural Higher Education Institutions, and Sponsor Scientific

Panels.

As to desired roles of the National Extension System, the

respondents indicated Agree on the average that the system should

Sponsor Training Programs Organized by Agricultural Universities/

Colleges for Its Extension Staff, and Encourage Universities/

Colleges to Carry-out Advisory Functions While It Does the Input

Distribution Functions for the Farmers.

The respondents also expressed Agree that desired roles of

the National Higher Education System should be to Coordinate

Inter-University/College Research and Extension Efforts,

Coordinate the National Budget for University/College Research

and Extension Activities, and Implement National Policies

on Agricultural Research and Extension at University/College

Levels.

Comparisons Across The Institutions. The responses of the

participants from the three institutions were statistically

tested for differences in perceptions for all but demographic

variables. The Kruskal-Wallis one way analysis of variance

technique was used for this purpose. In this technique, the

scores of the individual institutions for a given variable were

converted to one overall set of rank. The smallest score was given a

rank of 1, the next smallest, a rank of 2 and so on. Average ranks were given for tied scores. From a total of 122 variables considered for comparison, only 12 were found to be significant. Table XXVII contains a summary of the variables which were significant. This table includes the number of respondents who reacted to a given variable from each institution, rank sums, and rank means. The rank sums were obtained by adding the ranks under each institution for a particular variable. The rank means were obtained by dividing the rank sums by the number of respondents reacted to that particular selected variable. The Kruskal-Wallis test as designated by H-Test in the table was finally evaluated by the probability (p) value at the last column at alpha .05 and .01 levels.

From Table XXVII it can be noted that the following variables were found to be significant at the .01 level: Support from Department Head (for Extension), Support from Head of Institution (for Extension), Support from Head of Institution (for research), The Overall Opinion and Evaluation of Current Practices in Research, Insuring Economic Value of Proposed New Technology as a Factor for Setting Research Priorities, Institutional Budget to be Allocated to Research, and The Overall Integrated Functioning of Teaching Research and Extension.

TABLE XXVII

SUMMARY TABLE OF VARIABLES FOUND TO BE SIGNIFICANT AFTER
COMPARISON ACROSS THE THREE INSTITUTIONS
USING THE KRUSKAL-WALLIS ONE WAY
ANALYSIS OF VARIANCE

| | Rank Sum and Rank Mean Distribution By Institution | | | | | | | | | |
| | Alemaya | | | Awassa | | | Jimma | | | |
| Selected Variables | N | Rank Sum | Rank Mean | N | Rank Sum | Rank Mean | N | Rank Sum | Rank Mean | H-test P |
|---|---|---|---|---|---|---|---|---|---|---|
| Support from Department Head (for Exten) | 32 | 931 | 29 | 16 | 646 | 40 | 12 | 252 | 21 | 9.691 .008* |
| Support from Head of Institution (for Extension) | 33 | 877 | 27 | 16 | 678 | 42 | 12 | 936 | 28 | 9.446 .009* |
| Support from Department Head (for Research) | 31 | 806 | 26 | 13 | 321 | 24 | 12 | 336 | 28 | 8.500 .014** |
| Support from Head of Institution (for Research) | 31 | 806 | 26 | 17 | 697 | 41 | 12 | 336 | 28 | 9.517 .009* |
| The Overall Opinion and Evaluation of Current practices in Research | 35 | 1085 | 31 | 19 | 336 | 44 | 13 | 468 | 36 | 9.690 .008* |
| Lack of Appropriate Organization and Coordination for Research | 35 | 1225 | 36 | 18 | 414 | 23 | 13 | 507 | 39 | 7.330 .025** |
| Insuring Economic Value of Proposed New Technology as a Factor for Setting Research Priority | 30 | 1020 | 34 | 16 | 512 | 32 | 12 | 180 | 15 | 11.924 .003* |
| Institutional Budget to be Allocated for Teaching and Other Duties | 26 | 598 | 23 | 17 | 527 | 31 | 12 | 432 | 36 | 6.612 .037** |
| Institutional Budget to be Allocated for Research | 26 | 910 | 35 | 17 | 374 | 22 | 11 | 187 | 17 | 13.861 .001* |
| The Use of Full-Time Researchers With Part-Time Extension and Teaching Duties | 35 | 1330 | 38 | 20 | 480 | 24 | 12 | 456 | 38 | 8.226 .016** |
| Higher Education System Should Coordinate Inter-College/University Research and Extension Efforts | 34 | 1020 | 30 | 20 | 640 | 32 | 13 | 624 | 48 | 9.087 .011** |
| The Overall Integrated Functioning of Teaching, Research, and Extension | 34 | 1020 | 30 | 20 | 555 | 28 | 13 | 614 | 47 | 10.25 .006* |

 * Significant at P=.01
** Significant at P=.05

The variables which were significant at the .05 level included: Support from Department Head (for Research), Lack of Appropriate Organization and Coordination for Research, Institutional Budget to be Allocated to Teaching and Other Duties, The Use of Full-time Research with Part-Time Extension and Teaching Duties, and Higher Education System Should Coordinate Inter-University/College Research and Extension Efforts.

In order to identify the institutions which respondent perceptions were different from each other with regard to a given significant variable, the Kruskal-Wallis test was repeated by using only two institutions at a time. Tables XXVIII, XXIX, and XXX were constructed for this purpose. They show differences between Alemaya and Jimma, Awassa and Jimma, and Alemaya and Awassa respectively. The results from the Kruskal-Wallis test were found to be consistent when compared with the score means for each variable and for the individual institutions. For further comparison purposes, these score means are given in Appendix C.

Based on the above comparison procedures, the following differences were observed: Respondents from the Awassa College of Agriculture received a higher level of Support from Department Heads and Support from Head of the Institution for both research and extension activities than their colleagues from Alemaya and Jimma. No differences were observed between Alemaya and Jimma in this regard. Perceptions as to The overall Opinion and Evaluation of Current Practices in research of respondents from Awassa was significantly different from their colleagues from Alemaya and

TABLE XXVIII

KRUSKAL-WALLIS ONE WAY ANALYSIS OF VARIANCE
COMPARISON BETWEEN ALEMAYA AND JIMMA OF
VARIABLES FOUND TO BE SIGNIFICANT

| Selected Variables | Rank Sum and Rank Mean Distribution By Institution | | | | | | H-Test | P |
|---|---|---|---|---|---|---|---|---|
| | Alemaya | | | Jimma | | | | |
| | N | Rank Sum | Rank Mean | N | Rank Sum | Rank Mean | | |
| Support from Department Head (for Extension) | 32 | 768 | 24 | 12 | 216 | 18 | 246.5 | .130 |
| Support from Head of Institution (for Extension) | 33 | 759 | 23 | 12 | 288 | 24 | 187.5 | .782 |
| Support from Department Head (for Research) | 31 | 713 | 23 | 13 | 273 | 21 | 223.5 | .550 |
| Support from Head of Institution (for Research) | 31 | 682 | 22 | 12 | 276 | 23 | 171.5 | .686 |
| The Overall Opinion and Evaluation of Current Practices in Research | 35 | 805 | 23 | 13 | 364 | 28 | 177.0 | .222 |
| Lack of Appropriate Organization and Coordination for Research | 35 | 840 | 24 | 13 | 351 | 27 | 201.5 | .533 |
| Insuring Economic Value of Proposed New Technology as a Factor for Setting Research Priority | 30 | 750 | 25 | 12 | 144 | 12 | 292.5 | .001* |
| Institutional Budget to be Allocated for Teaching and Other Duties | 26 | 442 | 17 | 12 | 312 | 26 | 84.5 | .023** |
| Institutional Budget to be Allocated for Research | 26 | 598 | 23 | 11 | 110 | 10 | 235.5 | .002* |
| The Use of Full-Time Researchers With Part-Time Extension and Teaching Duties | 35 | 840 | 24 | 12 | 288 | 24 | 213.5 | .929 |
| Higher Education System Should Coordinate Inter-College/University Research and Extension Efforts | 34 | 714 | 21 | 13 | 455 | 35 | 108.0 | .005* |
| The Overall Integrated Functioning of Teaching, Research, and Extension | 34 | 714 | 21 | 13 | 403 | 31 | 131.0 | .012** |

* Significant at P=.01
** Significant at P=.05

TABLE XXIX

KRUSKAL-WALLIS ONE-WAY ANALYSIS OF VARIANCE
COMPARISON BETWEEN AWASSA AND JIMMA OF
VARIABLES FOUND TO BE SIGNIFICANT

| Selected Variables | Rank Sum and Rank Mean Distribution By Institution | | | | | | H-Test | P |
|---|---|---|---|---|---|---|---|---|
| | Awassa | | | Jimma | | | | |
| | N | Rank Sum | Rank Mean | N | Rank Sum | Rank Mean | | |
| Support from Department Head (for Extension) | 16 | 288 | 18 | 12 | 120 | 10 | 155.0 | .005* |
| Support from Head of Institution (for Extension) | 16 | 272 | 17 | 12 | 132 | 11 | 144.0 | .021** |
| Support from Department Head (for Research) | 16 | 304 | 19 | 13 | 143 | 11 | 161.0 | .009* |
| Support from Head of Institution for Research | 17 | 306 | 18 | 13 | 143 | 11 | 152.0 | .019** |
| The Overall Opinion and Evaluation of Current Practices in Research | 19 | 342 | 18 | 13 | 195 | 15 | 148.5 | .319 |
| Lack of Appropriate Organization and Coordination for Research | 18 | 234 | 13 | 13 | 260 | 20 | 64.5 | .032** |
| Insuring Economic Value of Proposed New Technology as a Factor for Setting Research Priority | 16 | 288 | 18 | 12 | 120 | 10 | 156.5 | .004* |
| Institutional Budget to be Allocated for Teaching and Other Duties | 17 | 238 | 14 | 12 | 204 | 17 | 76.5 | .251 |
| Institutional Budget to be Allocated for Research | 17 | 272 | 16 | 11 | 143 | 13 | 114.5 | .313 |
| The Use of Full-Time Researchers With Part-Time Extension and Teaching Duties | 20 | 280 | 14 | 12 | 252 | 21 | 67.0 | .035** |
| Higher Education System Should Coordinate Inter-College/University Research and Extension Efforts | 20 | 280 | 14 | 13 | 286 | 22 | 65.5 | .010* |
| Integrated Functioning of Teaching, Research, and Extension | 20 | 260 | 13 | 13 | 299 | 23 | 48.5 | .001* |

* Significant at P=.01
** Significant at P=.05

TABLE XXX

KRUSKAL-WALLIS ONE-WAY ANALYSIS OF VARIANCE COMPARISON
COMPARISON BETWEEN ALEMAYA AND AWASSA

| Selected Variables | Rank Sum and Rank Mean Distribution By Institution | | | | | | | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | Alemaya | | | Awassa | | | H-Test | P |
| | N | Rank Sum | Rank Mean | N | Rank Sum | Rank Mean | | |
| Support from Department Head (for Extension) | 32 | 672 | 21 | 16 | 496 | 31 | 156.5 | .023** |
| Support from Head of Institution (for Extension) | 33 | 693 | 21 | 16 | 528 | 33 | 130.0 | .003* |
| Support from Department Head (for Research) | 31 | 620 | 20 | 16 | 496 | 31 | 141.5 | .013** |
| Support from Head of Institution (for Research) | 31 | 620 | 20 | 17 | 544 | 32 | 132.5 | .003** |
| The Overall Opinion and Evaluation of Current Practices in Research | 35 | 805 | 23 | 19 | 684 | 36 | 165.0 | .001* |
| Lack of Appropriate Organization and Coordination for Research | 35 | 1085 | 31 | 18 | 360 | 20 | 443.0 | .014** |
| Insuring Economic Value of Proposed New Technology as a Factor for Setting Research Priority | 30 | 720 | 24 | 16 | 352 | 22 | 266.0 | .531 |
| Institutional Budget to be Allocated for Teaching and Other Duties | 26 | 494 | 19 | 17 | 442 | 26 | 153.0 | .080 |
| Institutional Budget to be Allocated for Research | 26 | 676 | 26 | 17 | 255 | 15 | 334.0 | .004* |
| The Use of Full-Time Researchers With Part-Time Extension and Teaching Duties | 35 | 1120 | 32 | 20 | 420 | 21 | 501.0 | .007* |
| Higher Education System Should Coordinate Inter-College/University Research and Extension Efforts | 34 | 918 | 27 | 20 | 580 | 29 | 311.0 | .582 |
| Integrated Functioning of Teaching, Research, and Extension | 35 | 1015 | 29 | 20 | 500 | 25 | 383.5 | .393 |

* Significant at P=.01
** Significant at P=.05

Jimma, marked by a higher level of rank mean, indicating that the respondents from this college had higher positive perceptions towards the research activities in their institutions than the respondents from Alemaya and Awassa. No significant difference was observed between Alemaya and Jimma in this regard. The rank mean for perceptions regarding the problem of Lack of Appropriate Organization and Coordination of Research for Awassa was significantly lower than Alemaya and Jimma, indicating that this problem was more serious in Alemaya and Jimma than in Awassa. With regard to Insuring the Economic Value of the Proposed New technology as a Factor for Setting Research Priorities, perceptions of the participants from Jimma were different from both Awassa and Alemaya, marked by low rank mean. There was no difference between Alemaya and Awassa in this regard. Perceptions as to Institutional Budget to be Allocated for Teaching and Other Duties for respondents at Jimma were significantly different from Alemaya, marked by a higher rank mean. No difference was observed between Alemaya and Awassa, and between Awassa and Jimma. Likewise, the respondents from Alemaya perceived Institutional Budget to be Allocated for Research at higher level than the respondents from Awassa and Jimma with a significant higher rank mean. No difference was observed between Awassa and Jimma in this regard. Regarding the Use of Full-time Researchers With Part-time Teaching and Extension Duties, the respondents from Awassa expressed lower perceptions for this issue than their colleagues from Alemaya and Jimma. There was no significant difference between Alemaya and Jimma in this regard. A

Significant higher rank mean was observed for The Higher Education System to coordinate Inter-College/University Research and Extension Efforts for respondents from Jimma than for Alemaya and Awassa. Despite high rank means, the respondents from Alemaya and Awassa had less support for this idea than the respondents from Jimma. No significant difference was observed between Alemaya and Awassa. The respondents from Jimma expressed greater support for the idea of Integrated Functioning of Teaching, Research and Extension than their colleagues from Alemaya and Awassa, marked by higher significant rank mean. No significant difference was observed between Alemaya and Awassa in this regard.

## Conclusions

1. The survey results indicated that a very large proportion of the faculty in the Agricultural Higher Education Institutions were male. With only 6% female faculty participation, the potential for them to contribute to research and extension to the same extent as their male counterparts is limited.

2. The overwhelming majority of the respondents surveyed were young in the age range between 26 and 38. This indicates that, relative to the ages of the institutions surveyed, the older and the more experienced faculty do not choose to stay in their institutions.

3. Comparison of the career stages (academic rank) of the faculty with their academic qualifications, number of years since obtained highest degree, and number of research projects completed

by the respondents indicated that either the academic promotions of the faculty have been neglected, or the standards for the promotion have been set so high that they were difficult to achieve.

4. The number and level of qualifications of the academic staff in the surveyed institutions provides a promising prospect to conduct effective research and extension programs. Given adequate technical support and proper working environment, these professionals can successfully conduct effective research and extension programs in the regions where the institutions are located.

5. Although the availability of resources to run effective research and extension programs in the surveyed institutions were not totally discouraging, the following current practices were perceived to require rehabilitation. For extension activities: Assigned time, funds for operations, consultation in operational strategies, computer services, lab and field facilities, and professional communications with peers outside the institutions. For research activities: Consultations in statistics, consultations in research design, lab and field facilities, funds for operations, computer services, professional communications with peers outside the institutions, consultations in research proposals, and library resources.

6. All current practices reported to be available below average extent were perceived to have high influence on the productivity of the respondents both in research and extension activities. Thus, there is an inverse relationship between the availability of selected

current practices and their influence upon productivity of professionals.

7. Analysis of perceptions of the extent to which selected factors were problems to the effectiveness of research and extension indicated that incentives for work done and availability of experienced senior staff were the top two perceived problems both for research and extension activities. The extent of problems related to policy and organizational issues were perceived at different levels for research and extension. However, lack of general understanding and appreciation of the role of research and extension in rural development was singled out to be not a problem in both areas of research and extension.

8. Although respondents were dissatisfied with both research and extension activities of their respective institutions, they were more dissatisfied with extension than research. This may infer an institutional bias favoring research activities to extension.

9. The focus of research efforts need to be upon projects which will impact the national economy and income of rural population. Attention should also be given to target groups who will be making use of new technology. This would include investigating economic considerations. As viewed by the respondents, this can best be achieved by forming a group or council in each institution to set research priorities, and the efforts of both research and extension should be coordinated by a single coordinator or director. Also, it is considered important that institutional teaching staff participate in research and extension activities, and that the

majority of institutional funding should be allocated to teaching

and other duties rather than to research and extension activities.

10. In the opinions of the respondents, centralized systems for

research and extension are not workable. The primary responsibility

for research and extension are considered to rest on regional

agricultural colleges/universities and these functions should be

included in the institutional plans. The focus of efforts should be

more on regional research and extension problems.

11. Conducting location specific basic and applied research,

and establishing direct linkages with national and international

research centers are considered the important functions of research,

whereas, extension should perform the functions of in-service

training, farm advisory, and offering specialized services through

the extension subject matter specialists.

12. The use of integrated on-farm research and extension

approach, and linkages with other organizations of similar interest

were found to be the most important extension research linkage

mechanisms. Other operational strategies for this purpose should

include interdepartmental joint research and extension approach

(farming systems research and extension), an overall integrated

function of teaching research and extension, the use of advisory

councils, scientific panels, regional committees, and the training

and visit extension approach.

13. National systems of agricultural research, extension, and

higher education are perceived to have a positive impact upon the

research and extension efforts of the Agricultural Higher Education

Institutions. Allowing agricultural colleges and universities in the research planning panels at national and regional levels, and cooperating and supporting graduate research projects were perceived to be the most important functions of the national agricultural research system. Also perceived to be the functions of this system are, sponsoring need based research, calling for joint research problem identification, and sponsoring scientific panels. Sponsoring in-service training programs organized by the agricultural colleges/universities, and encouraging these institutions to carry-out farm advisory programs are perceived to be the functions of the national extension system. Also perceived to be the important functions of the national higher education system are coordinating inter-college/university research and extension efforts, coordinating the national budget for college/university research and extension activities, and implementing national policies on agricultural research and extension at college and university levels.

14. Demographic comparisons across the three institutions which participated in this study indicated that the Alemaya University of Agriculture had more qualified and experienced faculty, and more research projects than the Awassa and Jimma colleges. However, the respondents from this university were found to be the most dissatisfied group with the research and extension activities in their institution, and demanded more budget particularly for research activities than the two other colleges. Further statistical comparison of perceptions of selected variables revealed

that these institutions had similar resource base, problems in implementing research and extension programs, and views towards the integrated system of teaching, research, and extension. Differences were observed in the extent of support from institutional leadership for research and extension activities, and a few other organizational factors. However, these differences did not lead to any valid generalizations regarding the use of an integrated system of teaching, research, and extension in the Agricultural Higher Education Institutions.

## Recommendations

Based on the findings of the study, the following recommendations were drawn for the Agricultural Higher Education Institutions in Ethiopia.

1. There is a need for policy objectives that will promote continuity and give the agricultural colleges and universities full responsibility for conducting region-wide research and extension programs. The policy is required to indicate government commitments to the programs, and explicitly explain the inter-organizational relationships between the agencies involved in agricultural development programs in the country.

2. There is a need for more agricultural colleges and universities with research and extension sub-systems in their organizational set-up for a wide-spread organized action of research and extension programs throughout the country.

3. Reorganizing the existing research and extension sub-systems with a strong resource and organizational base is essential. In this regard it is thought that:

a. The research sub-system should be re-organized with proper incentive and reward programs for the researchers, appropriate research funding policies, and a net-work of experiment stations and sub-stations.

b. The extension sub-system should be re-organized as an independent technology transfer unit rather than using this sub-system as an additional component grafted to any other department.

4. Steps to recruit more females into research and extension and to encourage older, more experienced faculty to remain at institutions. Attention should be given to standards for promotion and to provide incentives for work accomplished.

5. Increase availability of all current practices to both researchers and extension staff.

6. Bring extension to same level and status as research.

7. Agricultural Higher Education Institutions should maintain proper linkages with all agricultural development organizations in the country.

8. These institutions need to adapt effective operational strategies to link and extension programs.

9. Further research is deemed necessary in the following areas:

a. Research in the inter-organizational relationships among the agencies involved in agricultural research and extension programs in the country.

b. Research in research and extension policy.

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APPENDIXES

APPENDIX A

THE QUESTIONNAIRE

*Dear Colleague,*

*This questionnaire, which should take only a few minutes of your time, will provide the necessary information for developing and narrowing the gap between research and extension in the Agricultural Institutions of Higher Education in Ethiopia.*

*The information which you provide will be utilized for making a study of the organization and operational strategies to link research and extension in the Agricultural Institutions of Higher Education in Ethiopia, and eventually, write a Doctoral Dissertation about the study.*

*Because there are only a few educators with your experience, skill and knowledge, your input to the study is very valuable. Thank you for your time, consideration and cooperation, and feel free to comment on any of the questions and views at the back of this material.*

*Sincerely Yours,*

*Teffera Betru*
*Graduate Student*
*Oklahoma State University, U. S. A.*

# A STUDY OF THE ORGANIZATION AND OPERATIONAL STRATEGIES TO LINK RESEARCH AND EXTENSION IN THE AGRICULTURAL INSTITUTIONS OF HIGHER EDUCATION IN ETHIOPIA.

## I. GENERAL INFORMATION

1. Name of Your Institution: _____

2. Your Gender: (Circle One)      Male    or    Female

3. Your Age: _____

4. Your Present Career Stage: (Check One)
   - _____ Professor
   - _____ Associate Professor
   - _____ Assistant Professor
   - _____ Lecturer
   - _____ Other (Please Specify _____ )

5. Highest Degree Earned: (Check One)
   - _____ Doctorate
   - _____ Masters
   - _____ Bachelors
   - _____ Other (Please Specify _____ )

6. Please indicate the number of years since obtained highest degree. _____ years.

7. How long have you been serving in your present institution? _____ years.

8. During the past two years, what percentage of your time has been spent on the following?
   _____% Teaching _____% Research _____% Extension
   Is this the same as your employment agreement?   Yes    No    (Circle one.)
   If No, then what percentages were you hired to perform?
   _____% Teaching _____% Research _____% Extension

9. Please indicate the number of ongoing research projects in which you currently participate.____

10. Please indicate the number of research studies you have completed (published or unpublished) _____

II. a. PLEASE INDICATE YOUR PERCEPTION OF THE FOLLOWING CURRENT PRACTICES IN YOUR INSTITUTION AS TO THEIR AVAILABILITY TO YOU AND THEIR INFLUENCES ON YOUR PRODUCTIVITY IN <u>EXTENSION</u>.

1 = VERY LOW          5 = VERY HIGH
(Please circle one from each category)

| Availability To You (Circle One) | Current Practices | Influences On Your Productivity (Circle One) |
|---|---|---|
| 1  2  3  4  5 | Library Resources | 1  2  3  4  5 |
| 1  2  3  4  5 | Lab and Field Facilities | 1  2  3  4  5 |
| 1  2  3  4  5 | Assigned Time for Extension | 1  2  3  4  5 |
| 1  2  3  4  5 | Support from Department Head | 1  2  3  4  5 |
| 1  2  3  4  5 | Support from Head of Institution | 1  2  3  4  5 |
| 1  2  3  4  5 | Professional Communication With Peers Outside the Institute | 1  2  3  4  5 |
| 1  2  3  4  5 | Professional Communication With Peers in your Institute | 1  2  3  4  5 |
| 1  2  3  4  5 | Consultation in Operational Strategies | 1  2  3  4  5 |
| 1  2  3  4  5 | Secretarial Service | 1  2  3  4  5 |
| 1  2  3  4  5 | Computer Service | 1  2  3  4  5 |
| 1  2  3  4  5 | Funds for Operation | 1  2  3  4  5 |

II. b. PLEASE INDICATE YOUR PERCEPTION OF THE FOLLOWING CURRENT PRACTICES IN YOUR INSTITUTION AS TO THEIR AVAILABILITY TO YOU AND THEIR INFLUENCES ON YOUR PRODUCTIVITY IN RESEARCH.

1 = VERY LOW          5 = VERY HIGH
(Please circle one from each category)

| Availability To You (Circle One) | Current Practices | Influences On Your Productivity (Circle One) |
|---|---|---|
| 1  2  3  4  5 | Library Resources | 1  2  3  4  5 |
| 1  2  3  4  5 | Lab and Field Facilities | 1  2  3  4  5 |
| 1  2  3  4  5 | Assigned Time for Research | 1  2  3  4  5 |
| 1  2  3  4  5 | Support from Department Head | 1  2  3  4  5 |
| 1  2  3  4  5 | Support from Head of Institution | 1  2  3  4  5 |
| 1  2  3  4  5 | Professional Communication With Peers Outside the Institute | 1  2  3  4  5 |
| 1  2  3  4  5 | Professional Communication With Peers in the Same Institute | 1  2  3  4  5 |
| 1  2  3  4  5 | Consultation in Statistics | 1  2  3  4  5 |
| 1  2  3  4  5 | Consultation in Research Design | 1  2  3  4  5 |
| 1  2  3  4  5 | Consultation in Research Proposal | 1  2  3  4  5 |
| 1  2  3  4  5 | Secretarial Service | 1  2  3  4  5 |
| 1  2  3  4  5 | Computer Service | 1  2  3  4  5 |
| 1  2  3  4  5 | Funds for Operation | 1  2  3  4  5 |

II. c. PLEASE INDICATE THE EXTENT TO WHICH EACH OF THE FOLLOWING WAS A PROBLEM TO THE EFFECTIVENESS OF RESEARCH AND EXTENSION AT YOUR INSTITUTION DURING THE PAST TWO YEARS.

(Please check one from each category)

1 = Not A Problem At All          5 = A Serious Problem

PROBLEM TO RESEARCH                                        PROBLEM TO EXTENSION

| 1 | 2 | 3 | 4 | 5 | | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|---|---|---|---|---|
|   |   |   |   |   | 1. Lack of appropriate organization and coordination. |   |   |   |   |   |
|   |   |   |   |   | 2. Lack of continuity of programs. |   |   |   |   |   |
|   |   |   |   |   | 3. Failure to provide an effective balance in the allocation of limited resources. |   |   |   |   |   |
|   |   |   |   |   | 4. Lack of clear policy objectives. |   |   |   |   |   |
|   |   |   |   |   | 5. Lack of general understanding and appreciation of the role of research/extension in rural development. |   |   |   |   |   |
|   |   |   |   |   | 6. Failure to provide education programs (in service, workshops, etc.) for the staff. |   |   |   |   |   |
|   |   |   |   |   | 7. Availability of experienced senior staff. |   |   |   |   |   |
|   |   |   |   |   | 8. Working with the National Research Institute. |   |   |   |   |   |
|   |   |   |   |   | 9. Working with the Ministry of Agriculture. |   |   |   |   |   |
|   |   |   |   |   | 10. Publishing field and lab work results. |   |   |   |   |   |
|   |   |   |   |   | 11. Availability of appropriate technology to extend to farmers. |   |   |   |   |   |
|   |   |   |   |   | 12. Lack of well defined territorial mandate for operation. |   |   |   |   |   |
|   |   |   |   |   | 13. Incentives for work done. |   |   |   |   |   |
|   |   |   |   |   | 14. Other (Please Specify) _____ |   |   |   |   |   |

15. What is your overall opinion and evaluation of the current practices in the area of: (Circle one.)

    a. Research: 1   2   3   4   5                1 = Very Dissatisfied
    b. Extension: 1   2   3   4   5               2 = Dissatisfied
                                                  3 = Neutral
                                                  4 = Satisfied
                                                  5 = Very Satisfied

16. Do you have any comments on the current practices in the area of:

    Research: _____

    _____

    _____

    _____

    Extension: _____

    _____

    _____

    _____

## III. ON THE ORGANIZATION OF RESEARCH AND EXTENSION

1. Please rank the following factors in order of their importance as they contribute for setting research priorities in your institution.

    _____ The target group which is intended to make use of the new technology.
    _____ The agro-ecological zones for urgent need of improved technology.
    _____ Research needs with impact on national economy and income of rural population.
    _____ Insure limited resource not to be dispersed over too many activities.
    _____ Consider technologies tested outside of the country rather than attempting to develop new technology.
    _____ Ensure economic value of proposed new technology.

2. Who should determine research priorities for your institution? (Check One)

    _____ The research coordinator/director
    _____ Head of the institution
    _____ A National Council
    _____ A group of body or council in your institute.
    _____ Other (please specify:_____)

3. What percent of the institutional budget should be allocated for:

    Teaching and other duties _____%
    Research _____%
    Extension _____%

Please indicate your level of agreement with the following statements.

| | | |
|---|---|---|
| 1. Strongly Disagree | 4. Agree |
| 2. Disagree | 5. Strongly Agree |
| 3. Neutral | |

| | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|
| 4. In general, I support the idea of establishing regional agricultural Colleges or Universities with research and extension included in their educational objectives. | | | | | |
| 5. I support the fact my Institution focuses more on regional research and extension problems. | | | | | |
| 6. I recommend full-time researchers for my Institution with part-time extension or teaching duties as required. | | | | | |
| 7. I recommend full-time extension subject matter specialists for my Institution. | | | | | |
| 8. I recommend the teaching staff in my Institution participate in research and extension activities to some extent. | | | | | |
| 9. The function of research in my institution should be: | | | | | |
| a. Conduct basic and applied research on main campus | | | | | |
| b. Conduct inter-disciplinary applied research on stations of major agro-climatic zone. | | | | | |
| c. Tackle location specific problems and the evaluation of varieties or techniques on sub-stations. | | | | | |
| d. Establish direct links with national and international research centers. | | | | | |
| e. Other functions (Please specify) _____ | | | | | |
| 10. The function of extension in my institution should be: | | | | | |
| a. Training of trainers (Development agents and teachers of farmers training centers). | | | | | |
| b. Farm advisory function at farm or community level. | | | | | |
| c. Offering specialized services through extension subject matter specialists from the respective academic departments. | | | | | |
| d. Other functions (Please specify) _____ | | | | | |

## IV. ON THE OPERATIONAL STRATEGIES TO LINK RESEARCH AND EXTENSION IN YOUR INSTITUTION.

Please indicate your level of agreement with the following ideas as they contribute to link research and extension in your institution.

1. Strongly Disagree     4. Agree
2. Disagree     5. Strongly Agree
3. Neutral

| | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|
| 1. The use of a regional committee consisting of related organizations for research and extension. | | | | | |
| 2. The use of national and regional scientific panels. | | | | | |
| 3. The use of University/College research and extension advisory council. | | | | | |
| 4. Linkage with other organizations of similar interest. | | | | | |
| 5. The use of integrated on farm research and extension approaches. | | | | | |
| 6. The use of a Training and Visit extension approach. | | | | | |
| 7. Interdepartmental joint research and extension programs (Farming Systems approach). | | | | | |
| 8. The overall integrated functioning of teaching, research and extension. | | | | | |

9. Please respond to either statement A or B.

_____ A.  There should be only one Coordinator/Director for both research and extension activities in my institution.

_____ B.  There should be separate Coordinators/Directors for research and extension activities in my institution.

10. If given a choice, in what proportion would you like to perform each of the following functions:

Teaching _____ %
Research _____ %
Extension _____ %

11. What operational strategies do you recommend for your institution for the effective coordination of research and extension? _____

_____

_____

V. THE ROLE OF THE NATIONAL AGRICULTURAL RESEARCH, AGRICULTURAL EXTENSION, AND HIGHER EDUCATION SYSTEMS ON YOUR CAMPUS RESEARCH AND EXTENSION DEVELOPMENT.

The following statements represent opinions. Kindly check your position on the agreement - disagreement scale as the statement first impresses you.

1. Strongly Disagree     4. Agree
2. Disagree           5. Strongly Agree
3. Neutral

| | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|

1. The National Agricultural Research Institutes should:

   a. Strengthen the research capabilities of agricultural Universities and Colleges by sponsoring need based research programs. (contract research)

   b. Call for joint research identification with the agricultural higher education institutions.

   c. Sponsor scientific panels.

   d. Allow the participation of agricultural universities and colleges in the research planning panels at national and regional levels.

   e. Cooperate and support graduate research projects

   f. Any other function (please specify _____

   _____

   _____

2. The National Agricultural Extension System should:

   a. Sponsor training programs organized by agricultural colleges/universities for its extension staff.

   b. Encourage agricultural universities/colleges to carry out farm advisory function while it does the input distribution function for the farmers.

   c. Any other function (please specify _____

   _____

   _____

3. The Higher Education System should:

| | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|

    a. Coordinate inter-college/university research and extension efforts.

    b. Coordinate the national budget for university/college research and extension activities.

    c. Implement national policies on agricultural research and extension at university/college level.

    d. Any other function (please specify _____

_____

_____

Thank You For Your Cooperation!

APPENDIX B


CORRESPONDENCE

**OSU**

# Oklahoma State University

OFFICE OF INTERNATIONAL PROGRAMS

STILLWATER, OKLAHOMA 74078-0437
307 CITD
405-744-6535
TELEX: 160274 OSU UT
709606 OSU INTL PROG
FAX: 405-744-7529

June 2, 1992

Dr. Mitiku Haile
Acting President and V. Pres. Academic Affairs
Alemaya University of Agriculture
P.O. Box 138
Dire Dawa Ethiopia

Dear Dr. Mitiku Haile:

This correspondence will introduce Ato Teferra Betru, a doctoral candidate in Agricultural Education-Extension at Oklahoma State University. Ato Teferra is a graduate of Alemaya University and is a former Dean of the Ambo Junior College of Agriculture.

Ato Teferra is planning to write his thesis from data collected in Ethiopia. For this purpose he is in need of a list of names of all persons at Alemaya University and Dbre Zeit with academic backgrounds of PhD and MS degrees in Agriculture and agriculture related fields. Ato Teferra would also like the names of persons at Alemaya University who are involved with Extension on full time regardless of academic background.

Your assistance in providing this list will greatly expedite the information gathering and is greatly appreciated.

Sincerely,

Conrad L. Evans, Associate Director

**Oklahoma State University**

OFFICE OF INTERNATIONAL PROGRAMS

STILLWATER, OKLAHOMA 74078-0437
307 CITD
405-744-6535
TELEX: 160274 OSU UT
709606 OSU INTL PROG
FAX: 405-744-7529

June 2, 1992

Dr. Asefa Gebre-Amlak, Dean
Awassa College of Agriculture
Awassa, Ethiopia

Dear Asefa Gebre-Amlak:

This correspondence will introduce Ato Teferra Betru, a doctoral candidate in Agricultural Education-Extension at Oklahoma State University. Ato Teferra is a graduate of Alemaya University and is a former Dean of the Ambo Junior College of Agriculture.

Ato Teferra is planning to write his thesis from data collected in Ethiopia. For this purpose he is in need of a list of names of all persons at Awassa College of Agriculture with academic backgrounds of PhD and MS degrees in Agriculture and agriculture related fields. Ato Teferra would also like the names of persons at Awassa College of Agriculture who are involved with Extension on full time regardless of academic background.

Your assistance in providing this list will greatly expedite the information gathering and is greatly appreciated.

Sincerely,

Conrad L. Evans, Associate Director

**OSU**

## Oklahoma State University

OFFICE OF INTERNATIONAL PROGRAMS

*STILLWATER, OKLAHOMA 74078-0437*
*307 CITD*
*405-744-6535*
*TELEX: 160274 OSU UT*
*        709606 OSU INTL PROG*
*FAX: 405-744-7529*

June 2, 1992

Ato Mohammad Ahmad
Jimma Junior College of Agriculture
Jimma, Ethiopia

Dear Ato Mohammad Ahmed:

This correspondence will introduce Ato Teferra Betru, a doctoral candidate in Agricultural Education-Extension at Oklahoma State University. Ato Teferra is a graduate of Alemaya University and is a former Dean of the Ambo Junior College of Agriculture.

Ato Teferra is planning to write his thesis from data collected in Ethiopia. For this purpose he is in need of a list of names of all persons at Jimma College of Agriculture with academic backgrounds of PhD and MS degrees in Agriculture and agriculture related fields. Ato Teferra would also like the names of persons at Jimma College of Agriculture who are involved with Extension on full time regardless of academic background.

Your assistance in providing this list will greatly expedite the information gathering and is greatly appreciated.

Sincerely,

Conrad L. Evans, Associate Director

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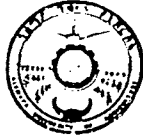
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ALEMAYA UNIVERSITY OF AGRICULTURE

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| ።Box | Dire Dawa | Tel 111400 | Alemaya | Ethiopia |

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Ref. No

ቀን __July 14, 1992_
Date

Mr. Conrad L. Evans
Associate Director
Office of International Programs
Oklahoma State University
USA

Re:  Request for list of academic staff members

Dear Mr. Evans:

Attached herewith please find the list of names of our staff members
with PhD and MSc degrees. I hope this will be of assistance to the
requirements of Ato Tefera Betru.

Hope to hear from you soon.

Yours,

ምትኩ ኃይሌ (ዶ/ር)
የአካዳሚክ ም/ፕሬዚዳንት
MITIKU HAILE, ( Dr. )
Academic Vice - President

ADDIS ABABA UNIVERSITY

AWASSA COLLEGE OF AGRICULTURE
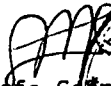
14/07/92

Mr. Conrad L. Evans,
Associate Director,
Office of International Programs


Dear Mr. Evans,

    Attached please find list of names of person at
Awassa College of Agriculture with Ph.D. and M.Sc.
degrees in Agriculture and related fields.


                              Yours Sincerely

                              Assefa Gebre Amlak
                              Dean
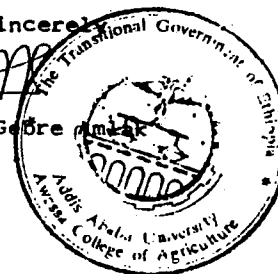

AG/ay

1504/ 3-2/92 ·
June 22 /92 ·

Mr. Conrad L. Evans,
Associate Derector,
Oklahoma State University
Office of International Programs-

Dear Mr. Evans,

This refers to your letter, dated June 2, 1992, about
the information Ato Tefera Betru wants to get from our
College. Currently the folowing instructors are working
in the College:-

|     |     |
| --- | --- |
| 1.  | MSc in Crop Protection |
| 2.  | MSc in Agronomy |
| 3.  | MSc in Weed Science |
| 4.  | MSc in Agronomy |
| 5.  | MSc in Soil Science |
| 6.  | MSc in Plant Breeding |
| 7.  | MSc in Animal Nutrition |
| 8.  | DVM- in Vet. Science |
| 9.  | MSc in Animal Breeding |
| 10. | MSc in Dairy Prod. |
| 11. | MSc in Animal Nutrition |
| 12. | MSc in Post Harvest Tech. |
| 13. | MSc in Agri. Economics |
| 14. | MSc in Economics |
| 15. | MSc in Development Economics |
| 15. | MSc in Biology |

Since our Extension service to the Community around the
College is not that strong   Only Ato Teshome Kebede and
myself are mainly involoved in

...12

.2.

However, most of the instructors participate in their areas of specialization whenever they are needed. At the moment, the College has an extension programme that is assisted by UNESCO and addressed to rural women-.
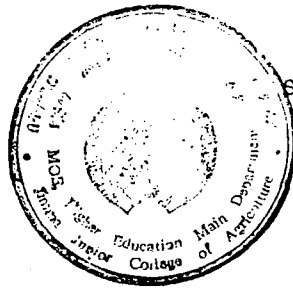
Sincerely Yours,

MOHAMMED AHMED
DEAN

APPENDIX C


VARIABLE SCORE MEANS BY INSTITUTION

TABLE XXXI

PERCEPTIONS OF EXTENT TO WHICH SELECTED CURRENT PRACTICES WERE AVAILABLE
TO RESPONDENTS FOR EXTENSION BY INSTITUTION

| Selected Current Practices | Perceived Mean Availability by Institution | | | | | | | | |
| | Alemaya | | | Awassa | | | Jimma | | |
| | N | $\bar{X}$ | SD | N | $\bar{X}$ | SD | N | $\bar{X}$ | SD |
|---|---|---|---|---|---|---|---|---|---|
| Library Resources | 33 | 2.67 | 1.05 | 16 | 2.67 | 0.95 | 13 | 2.62 | 1.04 |
| Lab and Field Facilities | 33 | 2.03 | 0.98 | 16 | 2.50 | 1.21 | 13 | 1.85 | 1.35 |
| Assigned Time for Extension | 33 | 1.82 | 0.95 | 14 | 1.50 | 0.65 | 11 | 2.09 | 1.44 |
| Support From Head of Institution | 33 | 2.79 | 0.13 | 16 | 3.94 | 0.85 | 12 | 2.90 | 1.67 |
| Support From Department Head | 32 | 3.31 | 1.06 | 16 | 4.00 | 1.09 | 12 | 2.83 | 0.94 |
| Professional Communications With Peers Outside the Institution | 33 | 2.03 | 0.98 | 16 | 2.31 | 0.95 | 12 | 2.08 | 1.38 |
| Professional Communications With Peers Within the Institution | 33 | 3.00 | 1.30 | 16 | 3.25 | 0.78 | 12 | 2.67 | 1.40 |
| Secretarial Services | 33 | 2.55 | 1.20 | 16 | 2.94 | 1.27 | 13 | 2.62 | 1.35 |
| Computer Services | 33 | 1.73 | 0.88 | 15 | 2.60 | 1.40 | 13 | 2.08 | 1.44 |
| Funds for Operations | 32 | 1.75 | 1.11 | 15 | 2.00 | 1.13 | 13 | 2.31 | 1.65 |

TABLE XXXII

PERCEPTIONS OF EXTENT TO WHICH SELECTED CURRENT PRACTICES WERE
AVAILABLE TO THE RESPONDENTS FOR RESEARCH BY INSTITUTION

| Selected Current Practices | Perceived Mean Availability by Institution | | | | | | | | |
| | Alemaya | | | Awassa | | | Jimma | | |
| | N | $\overline{X}$ | SD | N | $\overline{X}$ | SD | N | $\overline{X}$ | SD |
|---|---|---|---|---|---|---|---|---|---|
| Library resources | 32 | 2.44 | 1.05 | 17 | 2.60 | 1.06 | 13 | 2.39 | 1.33 |
| Lab and field facilities | 32 | 1.97 | 0.97 | 17 | 1.37 | 1.32 | 13 | 1.92 | 1.32 |
| Assigned time for research | 31 | 2.85 | 1.29 | 16 | 2.94 | 1.29 | 12 | 2.67 | 1.56 |
| Support from department head | 33 | 3.58 | 0.92 | 16 | 4.31 | 0.95 | 13 | 3.31 | 1.03 |
| Support from head of institution | 31 | 3.58 | 0.92 | 17 | 4.24 | 0.83 | 12 | 3.25 | 1.14 |
| Professional communication with peers out side the institution | 32 | 2.25 | 1.05 | 17 | 2.35 | 1.17 | 13 | 2.31 | 1.38 |
| Professional communications with peers within the institution | 32 | 3.44 | 0.95 | 17 | 3.53 | 0.94 | 13 | 2.77 | 1.17 |
| Consultation in statistics | 31 | 1.61 | 1.02 | 15 | 2.20 | 1.08 | 12 | 1.67 | 1.16 |
| Consultation in research design | 32 | 1.78 | 1.04 | 16 | 2.13 | 0.89 | 12 | 1.75 | 1.42 |
| Consultation in research proposal | 32 | 2.34 | 1.23 | 16 | 2.50 | 1.15 | 11 | 1.91 | 1.22 |
| Secretarial services | 32 | 2.41 | 0.95 | 16 | 3.00 | 1.16 | 13 | 2.77 | 1.54 |
| Computer services | 32 | 1.94 | 1.08 | 16 | 2.69 | 1.10 | 12 | 2.00 | 1.41 |
| Funds for operations | 30 | 2.20 | 1.24 | 16 | 2.06 | 0.99 | 13 | 2.00 | 1.29 |

TABLE XXXIII

PERCEIVED INFLUENCE OF SELECTED CURRENT PRACTICES ON PRODUCTIVITY OF
THE RESPONDENTS IN EXTENSION BY INSTITUTION

| Selected Current Practices | Perceived Mean Influence by Institution | | | | | | | | |
| | Alemaya | | | Awassa | | | Jimma | | |
| | N | $\bar{X}$ | SD | N | $\bar{X}$ | SD | N | $\bar{X}$ | SD |
|---|---|---|---|---|---|---|---|---|---|
| Library resources | 33 | 3.88 | 1.14 | 15 | 3.53 | 1.19 | 13 | 3.62 | 1.33 |
| Lab and field facilities | 33 | 4.03 | 1.40 | 15 | 4.13 | 0.99 | 13 | 3.39 | 1.66 |
| Assigned time for extension | 32 | 2.75 | 1.32 | 13 | 3.62 | 1.56 | 11 | 3.09 | 1.38 |
| Support from department head | 30 | 3.27 | 1.39 | 15 | 3.87 | 0.83 | 12 | 3.41 | 1.24 |
| Support from head of institution | 32 | 3.28 | 1.57 | 15 | 4.00 | 0.93 | 12 | 3.67 | 1.56 |
| Professional communications with peers out side the institutions | 32 | 3.50 | 1.41 | 15 | 3.80 | 0.94 | 12 | 3.67 | 1.37 |
| Professional communications with peers within the institution | 32 | 3.41 | 1.48 | 15 | 3.93 | 0.70 | 12 | 3.50 | 1.45 |
| Consultation in operational strategies | 30 | 3.47 | 1.46 | 14 | 3.64 | 0.93 | 12 | 3.25 | 1.60 |
| Secretarial services | 31 | 3.26 | 1.41 | 15 | 3.67 | 0.72 | 13 | 3.00 | 1.41 |
| Computer services | 31 | 3.23 | 1.71 | 15 | 4.07 | 1.22 | 12 | 3.17 | 1.57 |
| Funds for operation | 31 | 4.00 | 1.57 | 13 | 3.92 | 1.26 | 13 | 3.62 | 1.60 |

TABLE XXXIV

PERCEIVED INFLUENCE OF SELECTED CURRENT PRACTICES ON THE PRODUCTIVITY OF
THE RESPONDENTS IN RESEARCH BY INSTITUTION

| Selected Current Practices | Perceived Mean Influence by Institution | | | | | | | | |
| | Alemaya | | | Awassa | | | Jimma | | |
| | N | $\overline{X}$ | SD | N | $\overline{X}$ | SD | N | $\overline{X}$ | SD |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Library resources | 32 | 4.09 | 1.05 | 15 | 4.13 | 1.87 | 13 | 3.62 | 1.44 |
| Lab and field facilities | 32 | 4.44 | 0.88 | 15 | 4.27 | 1.10 | 13 | 3.46 | 1.66 |
| Assigned time for research | 31 | 3.97 | 1.25 | 16 | 4.00 | 0.82 | 12 | 3.58 | 1.24 |
| Support from department head | 31 | 3.48 | 1.22 | 15 | 4.00 | 0.85 | 13 | 3.31 | 1.82 |
| Support from head of institution | 31 | 3.58 | 1.31 | 16 | 4.04 | 0.77 | 12 | 3.50 | 1.31 |
| Professional communications with peers from out side the institution | 32 | 3.94 | 1.16 | 15 | 4.13 | 0.92 | 13 | 3.46 | 1.27 |
| Professional communication with peers within the institution | 32 | 3.53 | 1.12 | 16 | 3.88 | 0.88 | 13 | 3.46 | 1.27 |
| Consultation in statistics | 31 | 3.68 | 1.30 | 15 | 3.73 | 1.22 | 12 | 3.25 | 1.66 |
| Consultation in research design | 32 | 3.47 | 1.39 | 15 | 4.13 | 0.83 | 12 | 3.33 | 1.78 |
| Consultation in research proposal | 32 | 3.63 | 1.34 | 14 | 4.07 | 0.73 | 11 | 3.18 | 1.60 |
| Secretarial services | 32 | 3.41 | 1.26 | 13 | 3.62 | 0.87 | 13 | 3.08 | 1.50 |
| Computer services | 32 | 3.75 | 1.14 | 13 | 4.00 | 1.29 | 12 | 3.25 | 1.60 |
| Funds for operations | 31 | 4.23 | 1.31 | 13 | 4.46 | 0.78 | 13 | 3.62 | 1.61 |

TABLE XXXV

PERCEPTIONS OF THE EXTENT TO WHICH SELECTED FACTORS WERE PROBLEMS TO THE
EFFECTIVENESS OF EXTENSION BY INSTITUTION

| Selected Current Practices | Mean Level of Problem by Institution | | | | | | | | |
| | Alemaya | | | Awassa | | | Jimma | | |
| | N | $\overline{X}$ | SD | N | $\overline{X}$ | SD | N | $\overline{X}$ | SD |
|---|---|---|---|---|---|---|---|---|---|
| Lack of appropriate organization and coordination | 34 | 3.79 | 1.22 | 16 | 4.31 | 0.79 | 12 | 4.42 | 1.08 |
| Lack of continuity of program | 33 | 4.03 | 1.10 | 12 | 4.03 | 1.17 | 11 | 4.18 | 1.17 |
| Failure to provide effective balance in the allocation of limited resource | 33 | 4.06 | 0.89 | 14 | 3.57 | 1.16 | 12 | 3.67 | 1.07 |
| Lack of clear policy objective | 32 | 4.03 | 1.20 | 13 | 3.85 | 1.14 | 11 | 4.55 | 0.67 |
| Lack of general understanding and appreciation of the role of extension in rural development | 32 | 3.03 | 1.56 | 16 | 2.67 | 1.49 | 11 | 3.00 | 1.67 |
| Failure to provide educational programs for the staff | 33 | 3.94 | 1.17 | 16 | 4.00 | 1.03 | 11 | 3.91 | 1.22 |
| Availability of experienced senior staff | 32 | 4.53 | 0.92 | 15 | 4.07 | 1.34 | 10 | 4.60 | 0.84 |
| Working with the national research institute | 31 | 3.94 | 1.24 | 16 | 3.25 | 1.39 | 9 | 3.67 | 1.80 |
| Working with the Ministry of Agriculture | 32 | 3.95 | 1.16 | 15 | 3.53 | 1.51 | 11 | 3.55 | 1.44 |
| Publishing field and lab results | 31 | 3.97 | 1.08 | 14 | 3.14 | 1.46 | 11 | 3.27 | 1.42 |
| Availability of appropriate technology to extend to farmers | 32 | 3.81 | 1.20 | 16 | 3.44 | 1.46 | 12 | 4.58 | 0.67 |
| Lack of well defined territorial mandate | 33 | 3.67 | 1.43 | 13 | 3.30 | 1.43 | 12 | 4.08 | 0.99 |
| Incentive for work done | 33 | 4.52 | 1.00 | 15 | 4.20 | 1.01 | 12 | 4.58 | 1.17 |

TABLE XXXVI

PERCEPTIONS OF EXTENT TO WHICH SELECTED FACTORS WERE PROBLEMS TO THE
EFFECTIVENESS OF RESEARCH BY INSTITUTIONS

| Selected Current Practices | Perceived Mean Availability by Institution | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Alemaya | | | Awassa | | | Jimma | | |
| | N | $\overline{X}$ | SD | N | $\overline{X}$ | SD | N | $\overline{X}$ | SD |
| Lack of appropriate organization and coordination | 35 | 3.57 | 1.29 | 18 | 2.56 | 1.42 | 13 | 3.77 | 1.42 |
| Lack of continuity of programs | 35 | 3.74 | 1.21 | 16 | 2.81 | 1.42 | 13 | 3.54 | 1.33 |
| Failure to provide effective balance in the allocation of limited resource | 35 | 4.00 | 1.03 | 17 | 3.35 | 1.37 | 13 | 3.54 | 1.05 |
| Lack of clear policy objectives | 34 | 3.85 | 1.30 | 15 | 2.93 | 1.44 | 12 | 4.00 | 1.21 |
| Lack of general understanding and appreciation of the role of research in rural development | 32 | 3.06 | 1.56 | 17 | 2.88 | 1.36 | 12 | 2.58 | 1.56 |
| Failure to provide inservice programs for the staff | 35 | 3.86 | 1.14 | 17 | 3.88 | 1.11 | 13 | 3.62 | 1.39 |
| Availability of experienced senior staff | 33 | 4.42 | 0.87 | 17 | 3.47 | 1.51 | 12 | 4.42 | 1.68 |
| Working with the national research institute | 33 | 3.79 | 1.19 | 17 | 2.88 | 1.45 | 12 | 3.50 | 1.68 |
| Working with the Ministry of Agriculture | 34 | 3.65 | 1.23 | 17 | 3.29 | 1.57 | 10 | 3.40 | 1.71 |
| Publishing field and lab results | 34 | 4.21 | 0.95 | 16 | 3.25 | 1.44 | 12 | 3.67 | 1.61 |
| Availability of appropriate technology | 32 | 3.96 | 1.23 | 16 | 3.56 | 1.46 | 11 | 4.36 | 1.03 |
| Lack of well defined territorial mandate | 35 | 3.51 | 1.31 | 16 | 3.13 | 1.46 | 12 | 3.75 | 1.29 |
| Incentive for work done | 35 | 4.46 | 1.12 | 17 | 4.06 | 1.09 | 13 | 4.39 | 1.33 |

TABLE XXXVII

RESPONDENTS' OVERALL OPINION AND EVALUATION OF CURRENT PRACTICES IN THE
AREAS OF RESEARCH AND EXTENSION IN THEIR RESPECTIVE INSTITUTIONS

| Selected Current Practices | Opinions Expressed by Institution | | | | | | | | |
| | Alemaya | | | Awassa | | | Jimma | | |
| | N | $\overline{X}$ | SD | N | $\overline{X}$ | SD | N | $\overline{X}$ | SD |
|---|---|---|---|---|---|---|---|---|---|
| Research | 35 | 2.08 | 1.05 (D) | 19 | 3.11 | 1.05 (N) | 13 | 2.70 | 1.49 (N) |
| Extension | 35 | 1.79 | 0.88 (D) | 16 | 1.81 | 0.54 (D) | 13 | 2.61 | 1.45 (N) |

D = Dissatisfied
N = Neutral

TABLE XXXVIII

DISTRIBUTION OF RESPONDENTS BY INSTITUTION AS TO
OPINION OF WHO SHOULD DETERMINE
RESEARCH PRIORITIES

| Priority Setting Body | Distribution by Institution | | | | | | T O T A L | |
|---|---|---|---|---|---|---|---|---|
| | Alemaya | | Awassa | | Jimma | | | |
| | N | % | N | % | N | % | N | % |
| The Research Coordinator or Director | 5 | 14 | 1 | 5 | 4 | 33 | 10 | 15 |
| Head of the Institution | – | – | – | – | – | – | – | – |
| A National Council | 9 | 26 | 5 | 25 | 1 | 8 | 15 | 22 |
| A Group of Gody in the Institution | 19 | 54 | 14 | 70 | 7 | 59 | 40 | 60 |
| Others (Office of Higher Education etc.) | 2 | 6 | – | – | – | – | 2 | 3 |
| Total | 35 | 100 | 20 | 100 | 12 | 100 | 67 | 100 |

**TABLE XXXIX**

DISTRIBUTION OF RESPONDENTS BY INSTITUTION AS TO
HOW RESEARCH AND EXTENSION
SHOULD BE COORDINATED

| Coordination Mechanism | Distribution by Institution | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Alemaya | | Awassa | | Jimma | | Total | |
| | N | % | N | % | N | % | N | % |
| By the Same Coordinator or Director | 18 | 53 | 16 | 80 | 6 | 50 | 40 | 61 |
| By Different Coordinators or Directors | 16 | 47 | 4 | 20 | 6 | 50 | 26 | 39 |
| Total | 34 | 100 | 20 | 100 | 12 | 100 | 66 | 100 |

TABLE XL

PERCENTAGE OF INSTITUTIONAL BUDGET TO BE ALLOCATED FOR TEACHING AND
OTHER DUTIES, RESEARCH, AND EXTENSION AS PERCEIVED BY THE
RESPONDENTS FROM RESPECTIVE INSTITUTIONS

| Activity Area | Percentage Allocation by Area and by Institution | | | | | | | | |
| | Alemaya | | | Awassa | | | Jimma | | |
| | N | $\overline{X}$ | SD | N | $\overline{X}$ | SD | N | $\overline{X}$ | SD |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Research | 26 | 34.81 | 10.72 | 17 | 26.65 | 7.15 | 11 | 20.00 | 12.65 |
| Extension | 26 | 18.46 | 10.56 | 17 | 17.24 | 7.67 | 11 | 15.46 | 10.80 |
| Teaching and other duties | 26 | 47.70 | 15.37 | 17 | 56.06 | 13.26 | 12 | 67.90 | 23.79 |

TABLE XLI

RESPONDENTS LEVEL OF AGREEMENT WITH SELECTED RESEARCH AND EXTENSION
ORGANIZATIONAL ISSUES

| | Alemaya | | | Mean Level of Agreement by Institution Awassa | | | Jimma | | |
|---|---|---|---|---|---|---|---|---|---|
| | N | X̄ | SD | N | X̄ | SD | N | X̄ | SD |
| Establish Regional Agricultural Colleges and Universities with Research and Extension Included in Their Objectives | 35 | 4.11 | 0.90(A) | 20 | 4.35 | 1.14(A) | 13 | 4.62 | 0.65(SA) |
| Focus More on Regional Research and Extension Problems | 34 | 3.38 | 1.37(N) | 19 | 4.05 | 0.71(A) | 13 | 4.00 | 1.00(A) |
| The Use of Full-Time Researchers with Part-Time Extension and Teaching Duties | 35 | 3.67 | 1.37(A) | 20 | 2.60 | 1.31(A) | 12 | 3.67 | 1.23(A) |
| The Use of Extension-Subject Matter Specialists from the Respective Departments | 35 | 3.51 | 1.29(A) | 20 | 3.90 | 1.12(A) | 13 | 3.39 | 0.96(A) |
| Let the Teaching Staff Participate in Research and Extension Activities | 35 | 4.40 | 0.85(A) | 20 | 4.45 | 0.69(A) | 13 | 4.54 | 0.66(A) |
| The Function of Research Should be to: Conduct Basic and Applied Research on Main Campus | 34 | 3.71 | 1.00(A) | 20 | 4.10 | 0.85(A) | 13 | 3.92 | 0.95(A) |
| Conduct Interdisciplinary Applied Research on Stations of Major Agro-Climatic Zones | 34 | 4.71 | 0.52(SA) | 20 | 4.45 | 0.76(A) | 13 | 4.39 | 0.87(A) |

TABLE XLI (Continued)

| | Alemaya | | | Mean Level of Agreement by Institution Awassa | | | Jimma | | |
|---|---|---|---|---|---|---|---|---|---|
| | N | $\overline{X}$ | SD | N | $\overline{X}$ | SD | N | $\overline{X}$ | SD |
| Tackle Location Specific Problems on Substations | 33 | 4.27 | 0.84(A) | 20 | 4.40 | 0.68(A) | 13 | 4.39 | 0.65(A) |
| Establish links With National and International Research Centers | 35 | 4.80 | 0.41(SA) | 20 | 4.55 | 0.61(A) | 13 | 4.69 | 0.48(SA) |
| The Function of Extension Should be to: The Training of Trainers (Development Agents, Teachers of Farmers Training Centers etc.) | 35 | 4.37 | 0.69(A) | 20 | 4.45 | 0.69(A) | 12 | 4.00 | 1.20(A) |
| Farm Advisory Functions at Farm and Community Levels | 34 | 3.74 | 1.05 | 20 | 4.30 | 0.66(A) | 12 | 3.67 | 1.07(A) |
| Offering Specialized Services Through Extension Subject Matter Specialists | 34 | 4.18 | 0.68 | 20 | 3.75 | 1.07(A) | 13 | 4.15 | 0.69(A) |

A  = Agree
SA = Strongly Agree
N  = Neutral

TABLE XLII

RESPONDENTS' ACTUAL AND PREFERRED EXTENT OF PERCENTAGE
PROPORTION OF TIME ALLOCATION AMONG TEACHING,
RESEARCH AND EXTENSION BY INSTITUTION

| Area of Activity | Respondets' Mean Percentage Allocation of Time by Institution | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Alemaya | | Awassa | | Jimma | | Overall Mean | |
| | Actual | Preferred | Actual | Preferred | Actual | Preferred | Actual | Preferred |
| Teaching | 60 | 42 | 77 | 49 | 78 | 39 | 72 | 43 |
| Research | 33 | 40 | 22 | 34 | 10 | 38 | 21 | 38 |
| Extension | 7 | 18 | 1 | 17 | 12 | 23 | 7 | 19 |
| Total | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 |

TABLE XLIII

LEVEL OF AGREEMENT OF RESPONDENTS AS TO SELECTED OPERATIONAL
STRATEGIES TO LINK RESEARCN AND EXTENSION BY INSTITUTION

| Selected Operational Strategies | Mean Level of Agreement by Institution | | | | | | | | |
| | Alemaya | | | Awassa | | | Jimma | | |
| | N | X | SD | N | X | SD | N | X | SD |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| The Use of a Regional Committee Consisting of Related Organization for Research and Extension | 34 | 4.24 | 0.65(A) | 20 | 3.85 | 0.75(A) | 13 | 4.08 | 1.19(A) |
| The Use of National and Regional Scientific Panels | 34 | 4.15 | 1.08(A) | 20 | 3.95 | 0.99(A) | 14 | 4.46 | 0.52(A) |
| The Use of College/ University Research and Extension Advisory Council | 34 | 4.01 | 0.75(A) | 20 | 4.35 | 0.67(A) | 13 | 4.38 | 0.65(A) |
| Linkages With Other Organizations of Similar Interest | 34 | 4.41 | 0.61(A) | 20 | 4.50 | 0.51(A) | 13 | 4.77 | 0.44(SA) |
| The Use of Integrated on Farm Research and Extension Approach | 34 | 4.56 | 0.61(SA) | 20 | 4.60 | 0.50(A) | 13 | 4.77 | 0.44(SA) |
| The Use of Training and Visit Technique | 34 | 3.77 | 1.02(A) | 18 | 4.22 | 0.65(A) | 13 | 4.01 | 1.04(A) |
| Interdepartmental Joint Research and Extension Program (Farming Systems Techniques) | 34 | 4.47 | 0.61(A) | 20 | 4.40 | 0.68(A) | 13 | 4.69 | 0.48(SA) |
| The Overall Integrated Functioning of Teaching, Research and Extension | 34 | 4.32 | 0.84(A) | 20 | 4.25 | 0.55(A) | 13 | 4.92 | 0.28(SA) |

A  = Agree
SA = Strongly Ageee

TABLE XLIV

LEVELS OF AGREEMENT OF RESPONDENTS AS TO DESIRED ROLES OF THE
NATIONAL AGRICULTURAL RESEARCH, EXTENSION, AND HIGHER
EDUCATION SYSTEMS IN THE RESEARCH AND EXTENSION
ACTIVITIES OF THE AGRICULTURAL COLLEGES
AND UNIVERSITIES BY INSTITUTION

| | | | | Distribution By Institution | | | | | |
| | Alemaya | | | Awassa | | | Jimma | | |
| Desired Roles (Functions) | N | $\bar{X}$ | SD | N | $\bar{X}$ | SD | N | $\bar{X}$ | SD |
|---|---|---|---|---|---|---|---|---|---|
| Roles of the National Agricultural Research System: | | | | | | | | | |
| Strengthen the Research Capabilities of Agricultural Universities and Colleges by Sponsoring Need-based Research Programs (Contract Research) | 34 | 4.32 | 0.97(A) | 19 | 4.21 | 0.79(A) | 12 | 4.67 | 0.49(SA) |
| Call for Joint Research Identification With the Agricultural Higher Education Institutions | 34 | 4.27 | 1.02(A) | 20 | 4.25 | 0.97(A) | 13 | 4.31 | 1.18(A) |
| Sponsor Scientific Panels | 34 | 4.18 | 0.38(A) | 20 | 4.20 | 0.77(A) | 13 | 4.62 | 0.51(SA) |
| Allow the Participation of Agricultural Universtity and Colleges in the Research Planning Panels at National and Regional Levels | 34 | 4.47 | 0.79(A) | 20 | 4.20 | 0.77(A) | 13 | 4.77 | 0.44(SA) |
| Cooperate and Support Graduate Research Projects Research Projects | 34 | 4.59 | 0.78(SA) | 20 | 4.40 | 0.59(A) | 13 | 4.62 | 0.51(SA) |
| Roles of the National Extension System: | | | | | | | | | |
| Sponsor Training Programs Organized by Agricultural Colleges/Universities for its Extension Staff | 34 | 4.44 | 0.79(A) | 20 | 4.45 | 0.50(A) | 12 | 4.67 | 0.55(SA) |
| Encourage Agricultural Universities/ Colleges to Carry out Farm Advisory Functions While it Does the Input Distribution Function | 34 | 4.03 | 0.96(A) | 20 | 4.34 | 0.81(A) | 12 | 4.25 | 0.75(A) |
| Roles of the National Higher Education System: | | | | | | | | | |
| Coordinate Inter-College/University Research and Extension Efforts | 34 | 3.68 | 1.22(SA) | 20 | 3.85 | 1.09(A) | 13 | 4.54 | 1.13(SA) |

TABLE XVIV (Continued)

| Desired Roles (Functions) | Distribution By Institution | | | | | | | | |
| | Alemaya | | | Awassa | | | Jimma | | |
| | N | $\bar{X}$ | SD | N | $\bar{X}$ | SD | N | $\bar{X}$ | SD |
|---|---|---|---|---|---|---|---|---|---|
| Coordinate the National Budget for University/College Research and Extension Activities | 34 | 3.62 | 1.13(A) | 20 | 3.75 | 0.96(A) | 13 | 3.85 | 1.41(A) |
| Implement National Policies on Agricultural Research and Extension At University/College Levels | 34 | 3.56 | 1.08(A) | 20 | 3.70 | 1.13(A) | 13 | 3.59 | 1.45(A) |

A  = Agree
SA = Strongly Agree

VITA  𝓵

Teffera Betru

Candidate for the Degree of

Doctor of Education

Thesis: A STUDY OF THE ORGANIZATION AND OPERATIONAL STRATEGIES TO
LINK RESEARCH AND EXTENSION IN THE AGRICULTURAL HIGHER
EDUCATION INSTITUTIONS IN ETHIOPIA

Major Field: Agricultural Education

Biographical Data:

Personal: Born on August 28, 1952, in Gammo Goffa, Ethiopia,
the son of Captain Betru Mekuria and Bekelech Haile
Sellassie. Married with three children.

Education: Received Bachelor of Science degree in Agriculture
(Agricultural Education) from the Addis Ababa University,
College of Agriculture at Alemaya, in Ethiopia in May,
1977; completed requirements for the Master of Science
degree in Agricultural Economics from the University of
Leipzig in Germany in April, 1985; completed requirements
for the Doctor of Education degree from Oklahoma State
University in May, 1994.

Professional Experiences (in Ethiopia): 1986-90, Dean, Ambo
Junior College of Agriculture; 1985-86, Senior Expert and
Coordinator of Agricultural Education Programs in the
Commission for Higher Education; 1977-82, Deputy Dean and
Head of the Department of Agricultural Economics at the
Jimma Junior College of Agriculture.

Professional Memberships: Member of the International
Agricultural Extension and Education Society in the United
States; member of the Honor Society of Agriculture; Gamma-
Sigma-Delta at Oklahoma State University.

OKLAHOMA STATE UNIVERSITY
INSTITUTIONAL REVIEW BOARD
FOR HUMAN SUBJECTS RESEARCH

Proposal Title: _A STUDY OF THE ORGANIZATION AND OPERATIONAL STRATEGIES TO_

_LINK RESEARCH AND EXTENSION IN THE AGRICULTURAL HIGHER EDUCATION INSTITUTIONS IN_
ETHIOPIA
Principal Investigator: _Dr. Robert Terry/Teffera Betru_

Date: _November 24, 1992_ _____ IRB # _AG-93-008_ _____

---------------------------------------------------------------------

This application has been reviewed by the IRB and

Processed as: Exempt [x] Expedite [ ] Full Board Review [ ]

             Renewal or Continuation [ ]

Approval Status Recommended by Reviewer(s):

             Approved [x]              Deferred for Revision [ ]

             Approved with Provision [ ]     Disapproved [ ]


Approval status subject to review by full Institutional Review Board at
next meeting, 2nd and 4th Thursday of each month.

---------------------------------------------------------------------

Comments, Modifications/Conditions for Approval or Reason for Deferral or
Disapproval:

Signature: _Marcia L. Tilley_    Date: _11/24/92_ _____
       Chair of Institutional Review Board