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PERCEPTIONS OF COLLABORATION AND IMPEDING FACTORS HELD
BY UNIVERSITY TEACHING STAFF AND THE MALKERNS
RESEARCH PERSONNEL IN SWAZILAND.

By

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ABSTRACT

PERCEPTIONS OF COLLABORATION AND IMPEDING FACTORS HELD BY UNIVERSITY TEACHING STAFF AND THE MALKERNS RESEARCH PERSONNEL IN SWAZILAND.

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The study attempted to determine perceptions of collaboration and impeding factors to collaboration between the University of Swaziland Faculty of Agriculture and the Malkerns Agricultural Research Station held by the incumbent staffs. A self-administered questionnaire was used to collect data from 35 University Teaching Staff and 18 Malkerns Research Personnel. Of the totals, 29 University Teaching Staff and 18 Malkerns Research Personnel responded.

The findings of the study indicated that both University Teaching Staff and Malkerns Research Personnel perceived collaboration between the two institutions to be a sound proposition. Under each aspect of collaboration, they isolated those items they considered to be part of the inter-agency coordination process. Emphasis was placed on the sharing of infrastructures and physical facilities as a framework for building collaboration and to ensure that all research work is in the interest of national development. Respondents singled out those factors they considered to be potential inhibitors to collaboration in an attempt to build up a healthier inter-agency coordination process.

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CHAPTER 1

INTRODUCTION

Swaziland is a landlocked country wedged between South Africa to the north, west, and south, and Mozambique to the east. It has a total area of 17,364 square kilometres (6,704 square miles) with a compact oval shape. The maximum distance from north to south is less than 192 kilometres (120 miles) and 144 kilometres (90 miles) from the east to west. It is situated between the 26th and 27th southern parallels and has four well defined regions-namely: the mountainous Highveld, hilly grasslands of the Middleveld, rolling lowlands of the Lowveld or Bushveld, and the Lubombo escarpment. It has an elevation of 1,862 metres (6,109 feet) the highest and 61 metres (203.3 feet) the lowest from the sea. In 1985, the population was estimated at 600,000. Most people reside in the rural areas. The principal languages are English and Siswati. The majority of the population is christian who belong to various denominations.

The principal products are: (a) agriculture - maize, cotton, rice, sugar, citrus, millet, livestock, forestry; (b) manufacturing and Industry - processed foods, chemicals, wood pulp; and (c) mining - asbestos, iron ore, coal. There is also a railroad of about 220.8 Kilometres (138 miles).

The currency used is Emalangení and the current exchange rate is: one or E1.00 = US \$0.38. Swaziland has a diversified economy marked by social and economic dualism. The modern sector is represented by European-controlled agriculture, forestry, manufacturing and commercial interests. The traditional economy is characterized by subsistence farming.

Swaziland is a monarchy, ruled by the Queen Regent Ntombi after the death of His Majesty King Sobhuza II in 1982. The country gained independence from Britain in September 6, 1968.

For a long time, rural life for a Swazi farm family has been largely drudgery, characterized by poverty, with little hope of an easier and more prosperous way of living. The Department of Land Utilization (1962, p. 10) reported that rural life for a Swazi farmer has been so characterized because of ignorance, the use of small, uneconomic and fragmented holdings. Further, farming has been not regarded as a means of earning a better living.

In recent years, agricultural development has moved toward fundamental changes for a better and more efficient national development system. The Government's primary objective in the agricultural sector has been to improve the standard of living of the Swazi people by increasing productivity, greatly enlarged production of cash products for export and for domestic market, and better supplies of products consumed by Swazis themselves. By attaining this

primary goal, the Government has hoped that for the foreseeable future, the majority of the Swazis might continue to depend on agriculture for their livelihood. In this perspective, more efficient ways to improve the agricultural sector need to be identified and implemented as a matter of urgency.

A widespread advance in the agricultural sector requires a massive effort in the fields of research, training and extension education. According to the Post Independence Development Plan (1969, p. 28), this massive effort might be limited in the short run by the unavailability of trained and experienced staff. For this reason, the Government has set strategies to curb this limitation by: (a) concentrating on the most essential sector, which must be maintained at all costs - namely: research and training of agriculturalists; (b) laying foundations for advance on a broad front in subsequent years, which, inter alia, means giving high priority to the agricultural college and training of farmers; and (c) by concentrating the remaining efforts on those projects likely to have an early impact on the agricultural economy.

The country has further recognized that its economic growth entirely lies in the development of agriculture. For this reason, the Government aims to insure that human and natural resources are judiciously utilized by agricultural institutions. According to the Third National Development Plan (1978-1983, p. 6), a top-down process of decision

making with little involvement of the institutions responsible for agricultural development has been ineffective. In this respect, it becomes necessary to recognize that a bottom-up process, whereby the people serving under the many agricultural institutions be involved. This might lead the way toward a sound economic growth, self-reliance and social justice. In addition, incumbent staffs in the institutions might suggest better ways as to how resources might be deployed.

Swaziland is endowed with tremendous resources. However the richness in resources might not be as critical an issue as is the question of maximum use of these resources. Leistner and Smit (1969, p. 7) attest to this notion. They point out that Swaziland is the most favorably endowed black state in Southern Africa as far as natural resources are concerned. To a greater extent, these resources should be used by the country in the development of the agricultural sector. But, according to the Post-Independence Development Plan (1969, p. 23) Swaziland's agricultural sector has been characterized by serious structural problems which urgently need to be resolved in order to make progress in the utilization of the resources. Some of the problems hampering progress in the agricultural sector include among many others: inadequate education and training, insufficient credit facilities, unsatisfactory marketing machinery for agricultural products and weaknesses in the local authority system. Furthermore, available human and natural resources

are underutilized yet, the country's economic growth depends on the judicious use of these resources.

These impediments to the agricultural sector are complex and interwoven which makes it rather difficult to resolve their direct or indirect impact on the agricultural sector. Nevertheless, some actions need to be taken to help revitalize the agricultural sector. Agriculture is the backbone of the country with over 75 percent of the people earning their living from it. In connection with this view, the Ministry of Agriculture and Cooperatives (MOAC), through its Extension Education Service and the Malkerns Agricultural Research Station (MARS) and the University of Swaziland (UNISWA) - Faculty of Agriculture, have been designated the overall responsibility of monitoring the agricultural sector. The MOAC was established in 1930, the MARS in 1959, and the UNISWA in 1962 as an Agricultural College and Short Course Centre. These institutions, through their collaboration and cooperation, should have a potentially significant impact on the agricultural sector in Swaziland.

The Malkerns Agricultural Research Station

The Research Division was established in 1959. Prior to that time it had existed in the form of a tiny research unit. Its major purpose was exclusively the solving of soil - related constraints to crop production in Swaziland. Particular attention was given to soil fertility and fertilizer use problems. Because of the outgrowth of the

agricultural industry, several other research components were added with a view to ensuring full coverage of the whole range of farming problems by the Research Division.

The Ministry of Agriculture was responsible for the establishment of the central Research Station at Malkerns. The subsidiary research plots include: Mangcongco and Hebron in the Highveld, Luve and Nhlangano in the Middleveld, and at Big Bend in the Lowveld (Figure 1). Establishing a research plot in each region was an attempt to obtain full coverage of the country's four geographical zones. The primary aim was to ensure that research findings relating to each of Swaziland's four widely different agro-ecological zones were produced on sites for greater relevance to the problems of farmers living there.

An outgrowth of the Research Division has increased the scope and dimension of research objectives. According to the Annual Report of 1977-1978 (p. 2), the overall aims have been to: (1) find new methods of improving yield of crops and pastures; (2) reduce the production costs of crops by preventing damage by pests and diseases; and (3) find answers to the more immediate agricultural problems. The addition of the Cropping Systems Research and Extension Training Programme (CSRETP) and the Socio-Economic Units underscores the outgrowth of the Research Division and the attempt to enhance the impact of the Agricultural Research Division on the agricultural industry. However, the potential capability of the research division has not been

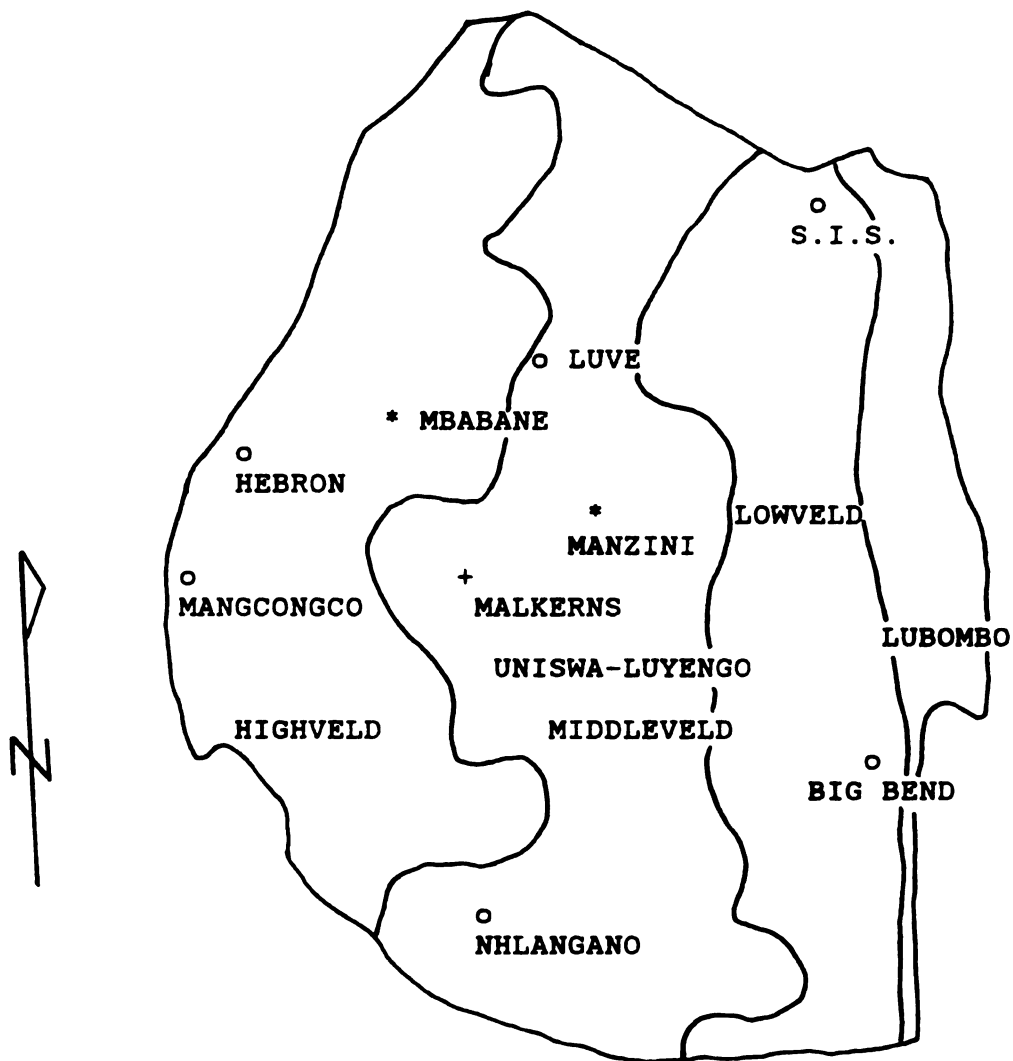


Figure 1.

Main ecological zones with Research Station and plots.

Key:

- + - Major Research Station
- o - Subsidiary Plots
- * - Cities nearest to the Central Research station and the Faculty of Agriculture

attained. According to the Brief Outline Report of the Role and Capabilities of Research in Swaziland (1984, p. 1), there was a need for the Research Division to make the greatest possible contribution to increase food and livestock production by small farmers. In addition, the Research Division needs to highlight the major functions of the various research Units in order to effectively contribute to agricultural development.

The various sections of the Research Division include: (1) Crop Agronomy; (2) Horticulture; (3) Veld and Pasture Management; (4) Dry Land Crop Production; (5) Soil Fertility and Crop Nutrition; (6) Soil Chemistry; (7) Plant Pathology; (8) Entomology; (9) Cotton Breeding; (10) Biometry; (11) Forestry; (12) Pineapple Production; (13) Cotton Entomology; and (14) Soil Physics. Their designated roles are described on Figure 2. On top of these disciplines, a large section - the Cropping Systems Research and Extension Training Programme has been added recently. This was a program under the auspices of the United States Agency for International Development (U.S.A.I.D.).

According to U.S.A.I.D. (1984, p. 1) the purposes of the program were threefold: (1) to assist the MOA to redirect its research efforts toward the Swazi Nation Land (SNL) farmer; (2) to aid the MOA in identifying farm problems, as well as the research trials and recommendations, that will emanate from the identification stage; and (3) to help with staff development program for

localization purposes . Further, the program was envisaged as an attempt to improve the agricultural information service in the MOA through provision of technical assistance training, equipment, vehicles and commodities. Apart from having a greater involvement with the MOA, the project intended to revitalize the functional relationship between the Malkerns Agricultural Research Division and the Faculty of Agriculture.

DISCIPLINE	DESIGNATED ROLE
Crop	1. Introducing field crop
Agronomy	2. Testing crop environment suitability
Horticulture	1. Evaluating vegetable variety
	2. Producing agronomic vegetable
Veld and	1. Introducing plant
Pasture	2. Testing nutritional value of pastures
Management	3. Evaluating pasture management techniques.
Dry Land	1. Developing methods of crop production
Crop	suitable for the management of rain-grown
Production	crops.
	2. Describing methods of crop production
	suitable for the management of rain-grown
	crops.
Soil Fertility	1. Defining crops response to major and minor
&	nutrients throughout Swaziland.
Crop Nutrition	2. Re-appraisal of fertilizer requirements.

DISCIPLINE	DESIGNATED ROLE
Soil	1. Developing soil and plant analysis techniques in order to provide information in more detailed and accurate fertilizer recommendations. 2. Determining interaction between lime application, soil pH and availability of plant nutrients.
Plant	1. Research and Service Functions.
Pathology	2. Providing practical advice to farmers on disease control.
Socio-Economic Section	1. Studying closely all socio-economic related issues (e.g., farmers' inclination to accept and reject innovations). 2. Advising on the socio-economic issues to the Extension Division.
Entomology	1. Compiling and cataloging the pests of major crops. 2. Re-establishing the National insect control. 3. Developing a systematic programme to evaluate economic control of insect pests.
Cotton Breeding	1. Testing and evaluation of overseas varieties. 2. Developing of cultivars suitable for rain-grown production.

DISCIPLINE	DESIGNATED ROLE
Biometry	1. Assisting in the design and analysis of the Division's field trial programme. 2. Providing assistance in Agricultural survey and census work of the MOAC. 3. Providing lectures in biometry within the university.
Forestry	1. Providing a base for the activities of the Forestry Research Unit. 2. Investigating of nursery techniques as an index of nutrition and growth curves of successive rotations.
Pineapple	1. Investigating the production of pineapples.
Cotton Entomology	1. Evaluating economic insect Control Programmes. 2. Formulating of procedures to control the population dynamics of American bollworm.
Soil Physics	1. Evaluating of soil physical structure on crop and pasture production. 2. Describing optimum cultural techniques for the pasture management of various soil types.

Figure 2.

Designated roles of Research Disciplines.

Some Issues on the Agricultural Research Division

Several developments have taken place since the Agricultural Research Division was established. Some of these changes need to be reinforced because of their potential impact upon the agricultural industry in Swaziland. Reinforcement of these changes might help increase the efficiency of the Agricultural Research Division. However, there has been events that have tended to impinge upon the potential impact of the Agricultural Research Division toward the agricultural industry.

Among the many events which have taken place, was the transfer of the responsibility for the Research Division to the University of Botswana, Lesotho and Swaziland (U.B.L.S.) in 1971. The purposes for the transfer; as stated in the Annual Report on Agricultural Research Division (1977-78, p.2) were: (1) to strengthen the University's presence in the country; and (2) to formalize ties between the University's Faculty of Agriculture and the Agricultural Research Division. This relationship lasted for approximately seven years after which the Government called for a retransfer of the Research Division to the MOAC. However, some people would argue that this retransfer transaction was not necessary. Additionally, most people saw the fostered relationship to be beneficial in certain ways.

Some of the perceived benefits included: (1) the review of the First Advisory Bulletin - a resource book on standard agricultural practices; (2) joint staff appointment for

teaching and research; and (3) share of research facilities for both research and instructional purposes and other miscellaneous physical materials. According to records, the fostered relationship was desirable in many aspects. First, it enhanced the original objective of formalizing the ties between the University and the Agricultural Research Division. Second, it allowed the two institutions to share both human and material facilities. Third, this relationship further extended the ties even with the MOAC. Fourth, the availability of a repertoire of research facilities enhanced instruction at the University. In addition, the overall training of the agriculturalists was monitored by all the three institutions- the UNISWA Faculty of Agriculture, the MOAC and the Agricultural Research Station. These benefits underscore the value of the relationship which was established.

Other changes that have emerged in recent years include: (1) the Government's policy to establish professional positions in the Agricultural Research Division; (2) the addition of new Research Disciplines namely: the Socio-Economic Research and the Cropping Systems Research and Extension Training; and (3) the effort to localize the established professional positions. Of the 13 established professional positions only two were said to be filled by Swazis namely: the chief research officer and the rural sociologists positions. The remaining posts will hopefully be filled up when the staff development program by

U.S.A.I.D. matures.

There has been other significant events that have to some degree been perceived as impediments to Agricultural Research in Swaziland. Some of these alleged factors have not been documented. In this respect, it becomes unjustifiable to discuss those which are not documented as evidence. The Annual Report of the Research Division (1977-78, p. 2-3) reflected more on the transfer of the research station's responsibility over to the U.B.L.S. The transfer was envisaged to strengthen the birth of the University and formalize ties between the University and the Agricultural Research Division. However, the retransfer process has led to events which thwarted the effort to enhance the functional relationships between the two institutions. During the retransfer transaction, there was a high loss of staff at all levels of research and it was hard to have the lost staff be replaced immediately.

Staffing has since been one of the major constraints in research. As result of this staff shortage, research has been carried out mainly by expatriate staff. The expatriate staff has been always criticized. According to U.S.A.I.D. (1984,p.4), expatriate researchers have worked toward meeting the needs of estates and the individual tenure farms more than they have toward meeting the needs of farmers living on the SNL. Furthermore, there were apparently insufficient counterparts (local citizens) to the expatriates researchers. For this reason, research has

lagged behind and has not made as great an impact as expected.

Other events that might have some impact on the agricultural industry from the Agricultural Research Division have included: (1) the absence of a research approach that addresses the conditions and constraints faced by small hold Swazi farmers; (2) a limited networking system between the MOA, UNISWA and MARS; and (3) lack in maximum utilization of the limited resources. Another pitfall reported in the Brief Outline Report of the Role and Capabilities of the Agricultural Research Division (1984: p. 2-3) was that: too many researchers tended to assume knowledge of the problems facing the farmer without deliberate and explicit attempts to go to the grassroots level to find out what the real problems are from the farmer himself. This has led to: (1) research which has little or no direct relevance to the real problems of small farmers; and (2) the depletion of the limited financial, material and human resources on research which may give no direct benefit to the people it was meant to serve. The report further states that because of reduced funding in research, the whole agricultural research unit including the staff were becoming greatly underutilized.

The limitations of resources and the lack of an adequate net-working system between the MOAC, UNISWA and MARS, underscored the need for further scientific investigation of potential ways to revitalize the impact of

agricultural research in Swaziland. In this perspective, potential effective strategies needed to be identified through scientific research. One promising approach was to seek a basis for ascertaining how research might be jointly undertaken. The University of Swaziland-Faculty of Agriculture was the immediate institution that shared common interests and goals with the Malkerns Agricultural Research Station. It became imperative to review the background of the University of Swaziland Faculty of Agriculture, particularly its role while it was recognized as the Swaziland Agricultural College and Short Course Centre, up to the present time as a fully fledged University.

The Swaziland Agricultural College and Short Course Centre.

In June 1962, the urgent need for establishing improved agricultural education facilities for the training of government staff, farmers, housewives, teachers, chiefs and head men was recognized. In order to successfully meet this requirement, the Department of Land Utilization (1962, p. 3) proposed that an Agricultural College and Short Course Centre be established. The proposal was welcomed by the Swazi Nation Council and plans were made to begin working on the project.

The initial consideration was to select a site for the institution. Meetings were held to deliberate on the plans and site selection suitable for the Agricultural College. The Malkerns Valley was selected because: (1) it had at

least three important soil types commonly found in the four geographical zones of Swaziland; (2) the land was found to be suitable for both rain grown and irrigated crops; (3) it is in close proximity to the central research station; (4) it has adequate water supply; (5) closeness to the headquarters of the district agricultural officer; and its (6) nearness to the Usuthu Mission. The latter has a School where it was anticipated that in the future agriculture might be taught.

In addition to the Government's staff requirement, there was a need for improved agricultural training for other purposes. Agriculturalists were needed for employment in private enterprises. The education of farmers, housewives, chiefs and head men was envisaged as a means to expedite the extension education services to the Swazi rural people. Further, the Short Course was to be used for refresher courses for the government staff - namely: agricultural administrators, extension agents, home economists and teachers, and for all as part of a continuing and adult education program. These courses were envisaged as having great appeal to the Swazis and would have a pronounced stimulating effect to the agricultural industry. Further, it was anticipated that from direct technical benefits that would accrue to the trainees, should have a social and public relations functions.

Another aspect of consideration was the type of institution required. According to the Department of Land

Utilization (1962, p.8), the institution was to take the form of a bipartite college consisting of an Agricultural College and a Short Course. Young men with at least a junior certificate were to be recruited. These were to be trained in the science and practice of agriculture. Graduates were expected upon successful completion of their studies to join the department of agriculture while others would go back to the land to farm or obtain employment in private sectors. Provision was made for selected candidates to pursue higher training programs in order to make locals eligible for appointment to senior technical positions in the Government sector. It was hoped that as soon as the institution operated smoothly and had competent instructors, women would be recruited for training as rural workers in agriculture and home management.

The Short Course Centre was further expected to vary in duration with type and subject to be taught. It was estimated that at least 300 adults per year would pass through the Centre. The levels of instruction would vary with the group taught. Courses were to have the dual object of providing: (1) technical information; and (2) stimulation of interests. Courses in home management, hygiene, cooking and infant care were expected to have a stronger agricultural bias and were to be offered to Swazi women. It was felt that Swazi women were in a position to exert much influence on rural life. Apart from classroom lectures at the college, the neighboring Malkerns Agricultural Research

was to be used as an information base centre.

It was proposed that full time staffs be assigned to the institution. Some officers from the Department of Agriculture (known as Department of Land Utilization at that time) were expected to assist with training in specialized subjects on part a time basis, while permanent teaching staffs were being trained. The training of permanent staff was to be organized such that: (1) outstanding Swazi candidates were sent to study agriculture with a view to appoint them upon graduation to a staff position; (2) outstanding Swazi candidates were to be sent to study agriculture in England with the idea of an appointment to the lecturer position; and (3) prospective candidates were sent to visit other African Colleges to study teaching methods and facilities that make an agricultural institution conducive to effective teaching. Upon completion of the tour, candidates were to be appointed as lecturers. The Department of Land Utilization (1962, p. 18-19) further reported that plans were made to send candidates to study modern methods of training adults and with emphasis to the use of audio-visual aids.

Some Changes in the Agricultural College and Short Course Centre

The opening of this multipurpose institution filled a long felt need in Swaziland. Its opening, according to Venn (1967, p. 3) was envisaged to have had a considerable impact

on the agricultural industry within a short time. It was perceived as a vehicle to expedite the localization policy and the new extension and rural development programs. In 1967, the Government of Swaziland and the University of Botswana, Lesotho and Swaziland (U.B.L.S.) agreed to associate the Agricultural College with the University hence its new name became Swaziland Agricultural College and University Centre (S.A.C.U.C.). The U.B.L.S. was formed in 1964 as a joint university for Botswana (formerly known as Bechuanaland), Lesotho (former name Basutoland) and Swaziland.

The establishment of the three-state university was an outcome of deliberations reached in principle between the High Commission Territories and the Oblates of Mary Immaculate of Pius XII Catholic University College at Rome in Lesotho. The three countries felt that their needs were not being met by the South African Universities. South African Universities placed restrictions to foreign black students upon university entry. For these reasons, the three countries concluded that studying in South Africa was undesirable and unpleasant for their students. Therefore, they decided to form a joint University in Lesotho.

The association of the Swaziland Agricultural College with the Malkerns Agricultural Research was another worthwhile action. It was envisaged that the association would improve the impact of the two institutions on agricultural development. It has already been pointed out that this

transfer was specifically an attempt to strengthen the presence of the University and formalize the relationship between the two institutions. This formalized functional relationship between the institutions did not last long. Reasons for the retransfer have not been clearly established. Whether or not the speculations that the University changed the primary focus of the Research Division was true has not been established. There is no documentation to attest to that speculation. The retransfer was said to be an attempt to align the focus of the Research Division.

The tremendous growth of the U.B.L.S. was marked by the inception of new programs namely: a diploma in Home Economics-Extension and Education components, Animal Production and Health and Agricultural Education. On top of the certificate and Diploma General Agricultural programs, two degree programs have been added. These additions have had some dimensional impact in terms of teaching staff, lecture halls, and other miscellaneous teaching facilities necessary for effective teaching. The shortage of miscellaneous facilities remains one of the most critical issues that needed to be resolved in order to allow the faculty of agriculture to have a greater impact on the agricultural sector in Swaziland by training more and competent agricultural technicians.

Upon independence, the three countries began to look more closely at their joint University arrangement. It was

decided that a University centre should be established in each country. The first to take action was Lesotho. Botswana and Swaziland later formed the University of Botswana and Swaziland (U.B.S.). Later, these countries implemented the plan of establishing a University centre in each country, which was ultimately followed by nationalization of each University. Hence in 1982, Swaziland had its own University designated as The University of Swaziland (UNISWA). The Faculty of Agriculture formed part of the UNISWA and is located approximately 24 kilometres (15 miles) from the main administration campus. As a result of the nationalization process, there was a significant loss of staff, teaching facilities, and a host of other facilities that were necessary for the efficient functioning of an educational institution.

The University calendar of (1984-85, p. 14-16) indicated that the Faculty of Agriculture had been under the leadership of a Swazi for approximately five years. It had a population of thirty-five teaching staff including those who were away for further education. There are however teaching positions that were vacant. The student population had been estimated at over three hundred. The teaching faculty was supposed to be housed in the faculty apartments. However, due to the limited available faculty apartments, not all the teaching faculty was living within the campus. The University was made up of five departments-namely: Home Economics, Agricultural Economics, Extension and Education,

Crops and Soil Sciences, Animal Health and Production and Land Use and Mechanization. A one year Certificate program had been reinstated and was a joint program by the Faculty of agriculture and the MOAC.

This briefly highlights several changes that have evolved up to 1986. The institution had grown from a small college to a full-fledged University. However, the shortage of miscellaneous facilities that were necessary for effective teaching underscored the need for further improvement of the institution. The notion that both human and natural resources have become scarce, signified that better ways to use these limited resources needed to be identified and implemented as a matter of urgency. The potential impact of the University on the agricultural sectors has not been reached.

Summary:

In recent years, the government of Swaziland has realized that for the foreseeable future, agriculture will play an important role in the lives of the Swazi people. In this respect, it became imperative for the government of Swaziland to constantly review its policies in order to ensure that policies were geared toward improving the agricultural sector. A widespread advance in the agricultural sector required a massive effort in: research and production of high and middle level manpower in agriculture.

Because of the limited human and natural resources, the

need for selecting ways to maximize the use of these resources became a real challenge. A policy that may attempt to urge all agricultural institutions to cooperate might not suffice without the incumbent staffs' willingness to collaborate. It was from this perspective that opinions of staff members from both institutions became essential in an effort to promote cooperation and collaboration between the University of Swaziland-Faculty of Agriculture and the Malkerns Agricultural Research Station.

The background information on the growth of these institutions has shown a remarkable expansion over a short period of time. Despite their rapid growth, the general feeling of many people has been that the institutions have not reached their potential impact on agricultural development. People have expressed that the production of middle and high-level manpower in agriculture and solid research in agriculture are the corner-stone of agricultural development. It was necessary to use reknown strategies like the inter-agency coordination approach as a basis for helping these institutions consolidate the limited resources and optimize their use. Perceptions held by incumbent staffs of these institutions became essential for they are the ones who can suggest most effective ways of building an institutional approach and nurturing the inter-agency coordination process.

Statement of the Problem

The problem is that the University of Swaziland-Faculty

of Agriculture and the Malkerns Research Station have worked together to some extent, however, at certain times this may not have been adequate. The need for these institutions to work together in order to optimize the use of resources has been critical, particularly when both human and natural resources have become scarce.

Purpose of the Study

The study was designed to determine perceptions held by the University of Swaziland Teaching Staffs and the Malkerns Agricultural Research Personnel regarding the possibilities for greater collaboration between the two institutions with the intention of maximizing the use of resources.

Objectives of the Study

Specifically, the objectives of the study were to:

1. Determine perceptions held by the University of Swaziland-Faculty of Agriculture Teaching Staff and the Malkerns Agricultural Research Personnel between the two institutions in terms of the following:

- a) identification of research problems
- b) securing of research funds
- c) advancement of academic staff
- d) training of students in various agricultural disciplines
- e) sharing of infrastructure and physical resources.

2. Determine their perceptions of factors which may impede collaboration between the University of Swaziland-Faculty of Agriculture and the Malkerns Agricultural

Research Station.

3. Elicit general comments and/or suggestions from the University Teaching Staff and the Malkerns Agricultural Research Personnel relative to ways the two institutions might improve their working relationships.

4. Provide the University of Swaziland and the Malkerns Agricultural Research Station with additional information on which to build cooperation between the two institutions.

Importance of the Study

The traditional roles of each institutions were clearly defined - namely: teaching of agricultural technicians to the Faculty of Agriculture and Research to the Agricultural Research Division. Despite the differences in their traditional roles, they have common features in terms of ultimate goals - to have a greater impact on agricultural development. In addition, teaching and research often blend very well. These institutions also are organizations composed of human and natural resources which have become very scarce. In this perspective, it becomes imperative that the two institutions find an effective way that might help them optimize the use of these limited human and natural resources in order to have a greater impact on agricultural development. A study of perceptions held by the Teaching Staff and the Research Personnel can provide a valuable source of information relative to collaboration between these institutions.

Definition of Terms

1. Conflict: interpersonal disagreements over substantive issues, that which arises out of indifferences in interests.
2. University Teaching Staff: All the academic lecturing persons in the Faculty of Agriculture.
3. Malkerns Agricultural Research Personnel: All those individuals who have professional research assignments at the research station.
4. Overlapping: Extending over, and covering part of in a complementary and appreciative way.
5. Organization: A total institution consisting of group activities, accomplishment of objectives, structure for coordinating and Control of people, and relationship among people and groups of people.
6. Organizing: The process of grouping activities and responsibilities and establishing relationships that will enable people to work together most effectively in determining and accomplishing the objectives of an enterprise.
7. Interfacing: A process by which human beings/ organizations confront common areas of concern, engage in meaningful related dialogue, actively search for solutions to mutual problems, and cope with these

solutions purposefully.

8. Stakeholders: Interest groups, potential gainers or losers of a program or a project.
9. Theory: A set of assumptions, concepts and principles that are applicable for dealing with specific problems at a particular point in time.
10. Concept: An abstraction formed by generalization from particulars.
11. Development: Increasing effectiveness and maximizing the use of resources.

CHAPTER 2

DATA COLLECTION

Method of Investigation

The study employed a descriptive method of research using a questionnaire. A self-administered questionnaire was designed with items and questions developed from several literature sources including: Banathy and Duwe (1978); Contant (1984); Gautum et al (1970); Idachaba (1980); Mulford and Klonglan (1979); Wu (1978). These literature sources provided background information on aspects and barriers to cooperation within and between organizations. With respect to items structuring, scales and appearance of questionnaire, the format recommended by Fink and Kosecoff (1985, pp.23-52) was adopted with slight modifications.

The questionnaire was pre-tested with candidates studying at Michigan State University. These candidates were selected on the following criteria: (1) a graduate student in the College of Agriculture; (2) worked either at an Agricultural Teaching Institution or at an Agricultural Research Station in his/her own country; and (3) were all from Africa. Ten graduates were selected also on the basis of their willingness to participate in the pre-testing.

Seven Professors were asked to look at the questionnaire for improving it. These professors were selected on the basis of having had an international experience preferably with Agricultural Teaching and/or Agricultural Research Institutes in Africa.

After pre-testing, the questionnaires were mailed to a lecturer in the University of Swaziland. The lecturer in turn, distributed 35 questionnaires to the teaching faculty and 30 to the research personnel in the Malkerns Agricultural Research Station. Completed questionnaires (72.3%) were returned to the lecturer who, in turn, forwarded them to the investigator for analysis.

The target populations were:

1. All University Teaching Staff in the Faculty of Agriculture.
2. All Malkerns Agricultural Research Staff.
3. The entire population of University Teaching Staff and Malkerns Research Personnel.

Treatment of Data

Data were organized and analyzed in the following way:

1. Data were summarized as to frequencies, means, percentages and standard deviation using the Agricultural and Extension Education Department STAT PAC Computer Facilities.
2. Used a key of: $\bar{X}=1.00-2.50$ as indicating agreement; $\bar{X}=2.51-3.50$ considered to indicate indecision; and $\bar{X}=3.51-5.00$ considered to indicate disagreement. The

scaling was adopted from Fink and Kosecoff (1985) and was modified for this study.

3. Data were tabulated and interpreted in narrative form.

Limitations of the Study

The study was limited to the University of Swaziland - Faculty of Agriculture Teaching Staff and the Malkerns Agricultural Research Personnel. Documents for background information were not readily available. Further, the study assumed that it is through cooperation that the two institutions might optimize their use of resources in order to have a significant impact on agricultural development.

CHAPTER 3

LITERATURE REVIEW

Introduction:

For many decades, agriculture has been widely recognized as a source of food and fiber and a renewable wealth for all nations. For this reason, all agricultural institutions have been urged to play a significant role in the production of food and fiber. In this case, Agricultural Universities and Agricultural Research Institutions were the target institutions that played a significant role in the production of food and fiber. Despite the scarcity of resources, these institutions are expected to strive to optimize the use of the available resources. In addition, it was imperative that these institutions consider the adoption of effective management of resources.

The pervasive constraint relative to both human and natural resources underscores the need for all agricultural institutions to consider working together as a means to maximize the use of resources. In that context, it became necessary to briefly define the concept of a theoretical construct for the study and review of primary functions of the agricultural institutions in question along with the literature review. These functions were used as a

guide for this research exercise.

Theory:

The term 'theory' has been widely defined. These many definitions have been worded, phrased and structured differently. However, the overall meaning and connotation of the word has been the same.

According to Kerlinger (1964, p. 11), theory refers to: A set of interrelated constructs, (concepts) definitions, and propositions that presents a systematic view of phenomena by specifying relations among variables with a purpose of explaining and predicting the phenomenon. Clearly, this definition has presented the notion that a set of propositions consisting of explicit, measurable and interrelated concepts can be made on a particular phenomenon. These propositions can be used to predict and describe a given phenomenon. This view is congruent with Borg and Gall (1983, p. 20) relative to their view that a theory is necessary to be used as a tool to: (1) describe; (2) predict; (3) control; and (4) explain a given phenomenon. Furthermore, they strongly believed that a theory should be science based, sound and be used in appropriate situations.

Einstein and Infed (1938, p. 3) defined theory as: (1) A set of facts and concepts leading to a specific point in time; (2) A set of facts and concepts that will allow researchers to arrive at complete solution of problem in

time; and (3) A set of explanation consistent with the clues already discovered. They wrote that these facts and concepts can be tentatively accepted until they are verified. In Owen's view (1970, p. 35), the term theory refers to a process of thinking about reality. Both definitions have the notion of theory as a tool that might be used to describe a phenomenon. This makes a sound theory to be used as basis for scientific inquiry. He further characterized theory as a tool that should: (1) help researchers organize collected data into a systematic orderly body; and (2) provide a guide to researchers.

Summary:

Briefly, this introduction and the definitions of theory has underscored the importance of a sound theory as a guide to scientific inquiry. The importance of this study as a continuous effort to improve the impact of agricultural institutions cannot be overemphasized. Establishing a theoretical construct as a basis for such a study becomes a necessity. The theory can be used as a baseline for generalizations of the findings.

Theories Related to Institution Building, Effectiveness, Impacts and Options:

Gautum et al. (1970, p. 3); Cleland and King (1983, p. 21); Mulford and Klonglan (1979, p. 4-5) have developed related models that have been used by social scientists in

helping organizations to have a greater impact. The demand for such models have been increased by the desire for organizations to perform their jobs efficiently. This eagerness in organizations to know how well they are doing their job was confirmed by Hall (1972, p. 10-11).

Gautum et al. (1970, p. 3) used a diagram to present a model which they believed would be an approach to 'institution building.' This institution building approach consists of two variables - - institution and environment. The diagram below presents this model in perspective (Figure 3). They elucidated that this model can be useful in building innovative institutions. The institution variables should interact with the environmental variables so that an institution can establish a functional relationship with the environment. It is from this perspective that this model can be used as a vehicle for measuring each institutions' effect relative to the use of resources. Additionally, this model can be used by an organization to determine its functional relationship with other institutions.

However, this model has been criticized as being incomplete by social scientists. Their criticism has been twofold. First, they have argued that the institution-building approach does not present in perspective how should an institution relate to its environment and other institutions once each institution's variables have been identified. Second, they have pointed out that this approach needs complimentary models which can reinforce efforts with

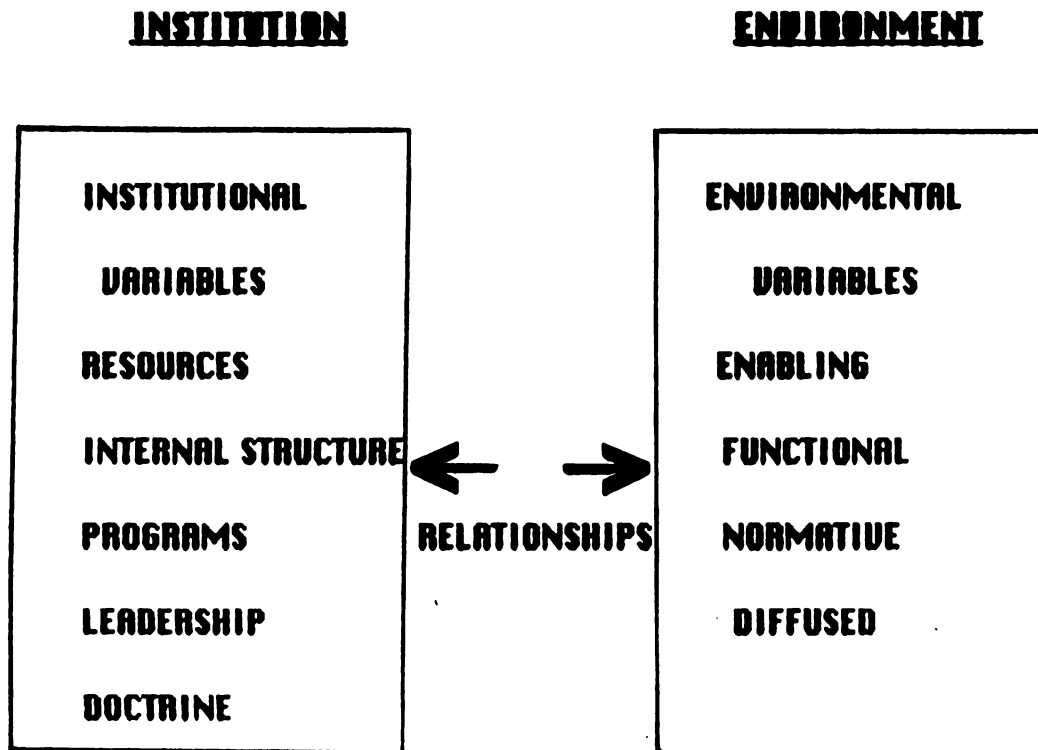
respect to building cooperation. In addition, they have asserted that this approach focus to a single organization, yet, the need for establishing inter-agency coordination requires models which will put in perspective better ways of nurturing collaboration. Therefore, this model was considered to be deficient.

Cleland and King (1983, p. 21) have provided an abstract system model as a better version of how organizations should function. This model (Figure 4) exhibits an organization as a process of interaction between inputs and outputs in order to achieve the organizations' set goals. They described the process of interaction between inputs and outputs as a measure that can be used to ascertain how efficient and effective organizations use available resources. These could be either human or natural resources, sometimes both.

The diagram below illustrates the model even much better. The interaction between inputs and outputs is weighed by the two key terms 'effectiveness feedback' and 'efficiency feedback.' They wrote that this model can be adopted by an organization or a group of organizations in order to determine how they are using available resources. In this respect, their model seems to be an extension of the one proposed by Gautum (1970). Both models were geared toward helping organizations to be more effective and innovative.

The work of Mulford and Klonglan (1979, p. 4-5) in

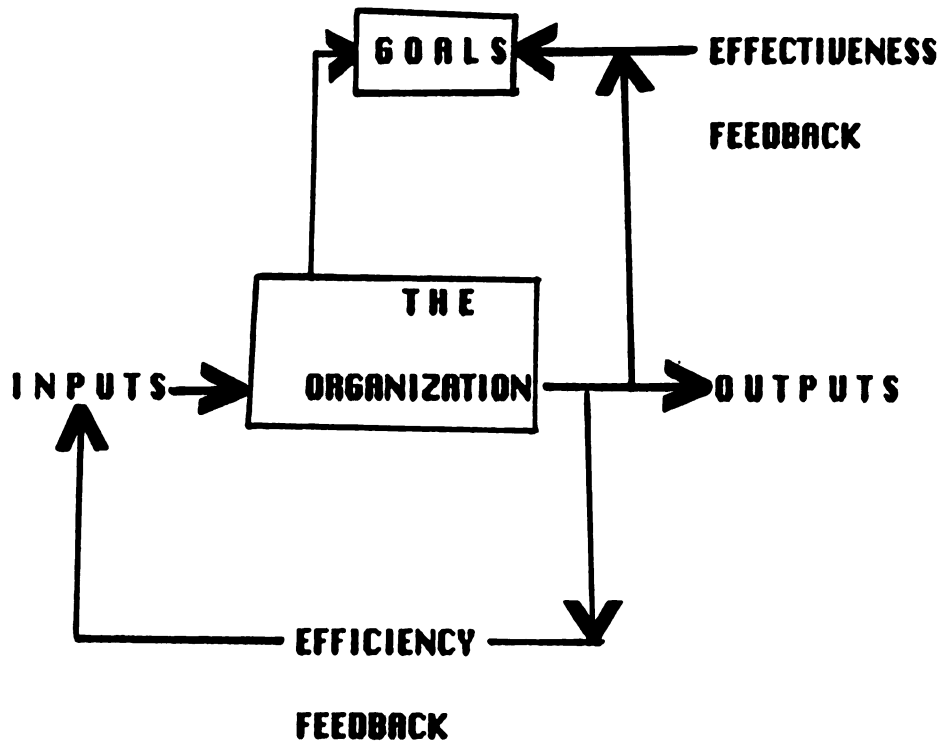
THEORETICAL FRAMEWORK OF STUDY

THE INSTITUTION -BUILDING UNIVERSE

GAUTUM et al. (1970, p.3)

Figure 3

THE ABSTRACT SYSTEMS MODEL OF ORGANIZATIONS



CLELAND AND KING (1983, P. 21)

Figure 4

designing another model to be used as a theoretical framework relative to inter-agency coordination has been a great contribution. They proposed a coordination impact model (Figure 5a and 5b). This coordination impact model shows two aspects. First, what happens when an organization is working alone. Second, what happens when organizations are working together. The difference is clearly observed from the model. The model assumes that this kind of impact is relevant to organizations pursuing the same goal. They further presented a coordination option model with some examples of activities that can be central to coordination (Figure 6).

Summary:

These theoretical constructs clearly indicate how organizations should operate individually and in team approaches. Their functioning individually and/or in group efforts relative to optimizing the use of the limited available resources cannot be overemphasized. In this century, resources have become scarce, yet organizations are still expected to provide quality services or goods. It is from this perspective that these theoretical framework were identified and briefly described as a basis for this study. The theme the researcher inferred from these related models was the articulation of organizational effectiveness relative to the use of resources and increasing impact of organizations through team efforts. This became a necessity

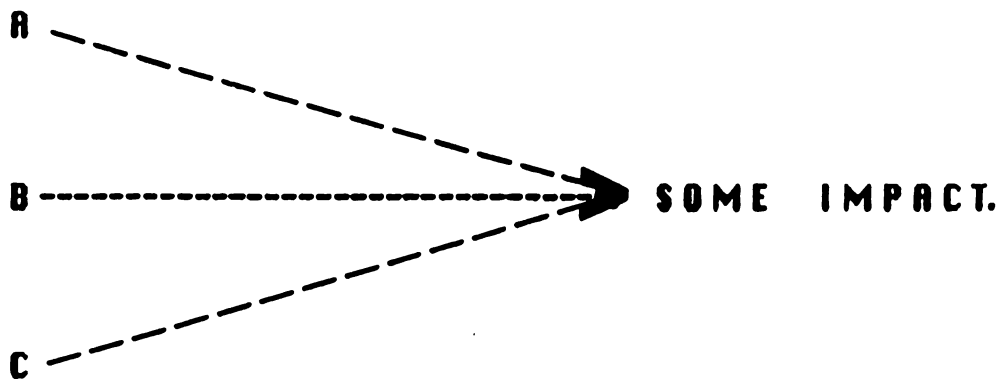
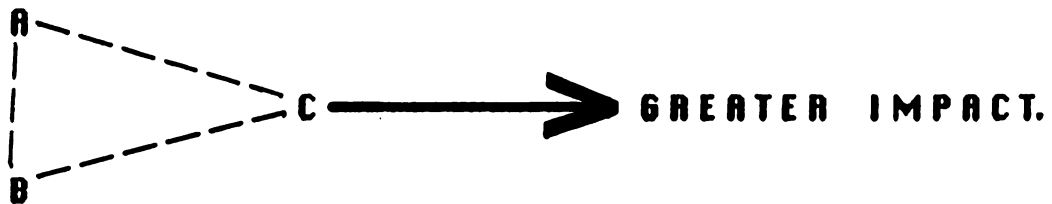
COORDINATION OPTIONS

OPTIONS	ACTIVITIES
*****	*****
++ VOLUNTARY	++ PLANNING
++ VOLUNTARY WITH	
FORMAL AGREEMENTS	++ ACTION
++ MANDATED	++ EVALUATION

MULFORD AND KLONGLAN (1979, P. 5)

Figure 6

COORDINATION IMPACTS

a. WHEN AN ORGANIZATION IS WORKING ALONE:**b. WHEN ORGANIZATIONS ARE WORKING TOGETHER :****MULFORD AND KLONGLAN (1979, P. 4)****Figure 5**

as a framework of the study of perceptions of collaboration between the University of Swaziland Faculty of Agriculture and the Malkerns Agricultural Research Station held by the University Teaching Staff and the Malkerns Research Personnel in Swaziland.

The Importance of Collaboration in Institutional Effectiveness:

Collaboration within and between organizations, particularly those with mutual goals and interests, has been widely recognized as a potential means of helping them to have a greater impact. In this century, when resources have become very scarce, the need for organizations to engage in a collaborative effort has become inevitable. Banathy and Duwe (1978, p. 4) delineated four reasons why organizations should collaborate. They wrote that cooperation can be: (1) cost effective especially when budgets have taken an ever-rising toll; (2) helpful in allowing institutions engaged in the partnership to share facilities and resources; (3) useful in providing more bargaining power for funds; and (4) helpful in providing each institution the opportunity to benefit from the other's expertise. Their recommendation of collaboration was a result of a consultance experience they had with public and private schools in California relative to cooperation between public and private schools; between schools and business industries and between schools and labor organizations.

Because of the complexity and difficulty in establishing collaboration, they described key steps to be followed by those institutions planning to engage in a partnership. They described these steps as follows - Each institution should: (1) clearly define its area of interest; (2) specify territories; (3) identify relevant organizational goals; (4) establish inter-organizational commitment to the areas of interest; (5) agree on goals with area of interest; (6) agree and be committed on means to be used to accomplish goals; (7) formulate negotiated agreement; (8) implement; and (9) evaluate the successes of the collaborative process. These steps seem to underscore the importance of each institution to be fully committed in the process of cooperation.

In a restricted paper, Cooper and Ploor (1984, p. 4) asserted that cooperation in this century is necessary to achieve increased innovation and productivity. They pointed out that increased productivity frequently requires participation of more than one sector. Their strong contention was that a systematic process to accelerate the building of collaborative long-term relationships among various sectors is extremely important. In this respect, they postulated that multisector and long-term relationships have always been necessary to address today's complex issues. In addition, they wrote that a connections program that might bring together representatives from business, industry, university, government, and other sectors to work

together on opportunities of mutual interest is paramount.

The paper was directed to the United States environment with particular reference to the state of Michigan. They drew heavily on other research studies on cooperation to support their paper. The concept of cooperation is not indigenous to the state of Michigan but can be transplanted to other cultures. In summary, they recommended that managers of organizations, university professors or administrators should: (1) develop short-term to long-term working relations; (2) look at other sectors more as resources rather than barriers; (3) seek areas of collaboration rather than competition; (4) promote openness to ideas, people and processes rather than formation of early judgment; and (5) initiate cross-boundary relationships rather than waiting for others to do so.

In another effort to rationalize collaboration within and between organizations, Scott and Mitchell (1972, p. 5) wrote that in this 20th century, the scarcity of resources has been the most driving force. In their opinion, organizations should consider themselves as carriers of material resources, technologies, human skills and values. In this respect, they should aim at optimizing these resources by assembling and transforming them into utilities. While acknowledging the shortage of resources, they pointed out that organizations should collaborate even when they have resources in abundance in order to provide more services and goods. They have quoted Mooney and Riley

to have defined coordination as an orderly arrangement of group effort to provide unity of action in the purpose of common purpose.

It becomes very clear that the concept of collaboration has been widely recognized. So far, the general benefits from cooperation have been described along with key steps to be followed in establishing the process. However, this may reflect the establishment of collaboration as a smooth process. Wren (1969, p. 5) alluded to the difficulties faced in establishing an inter-organizational process. His remark was: what happens when different organizations each relatively autonomous to its own objectives and organizational culture, must cooperate to serve a large system? In responding to this statement, he succinctly pointed out that this might result in a unique and problematic inter-organizational coordination.

Rossi et al. (1982, p. 9) confirmed that most organizations favor the idea of working in isolation. They elucidated that organizations usually prefer to operate under separate and distinct legal mandate and funding resources. Other organizations might have the desire to work under: (1) individual administrative structure; (2) geographical boundaries; and (3) specific objectives. These notions present the view that establishing collaboration within and between organizations was a real challenge. In this perspective, it became necessary to explore some of the potential barriers to collaboration.

Numerous issues have been identified as potential impeding factors to collaboration between organizations. According to Wu (1978, p. 4), conflict has always been the number one cause preventing organizations to engage in a collaborative effort. He defined conflict as a phenomenon arising over substantive issues among organizations. He elucidated that these issues might include: (1) policies; (2) organizational structures; (3) goals pursued by each institution; and (4) practice of each organization. In addition, he wrote that conflict in organizations is inevitable and should be dealt with when it arises.

Banathy and Duwe (1978, p. 5); Wu (1978, p. 4); Mulford and Klonglan (1979, p. 9-10) enumerated some specific examples of factors that might inhibit collaboration: (1) fear of losing autonomy; (2) the amount of time required and energy to maintain a linkage process; (3) fear of potential to cloud accountability for successes or failures; (4) the need to exactly determine the benefits; and (5) fear of exposure of organizational weaknesses.

According to Mulford and Klonglan (1979, p. 9-10), other impeding factors to collaboration might include: (1) threat to organizational autonomy; (2) professional staff fears; (3) client representativeness; (4) disagreements among resource providers; (5) multiple governments and private organizations; (6) lack of domain consensus; (7) different expectations from federal, state and local levels; (8) coordination perceived as a low priority; (9) costs and

benefits being undetermined; and (10) fear due to the scarcity of resources. Mulford and Klonglan (1979, p. 7-8) added to the list of potential impeding factors. These could be: (1) fiscal in terms of joint budgeting and application for funds; (2) fund transfer and purchasing of services; (3) personnel practices such as consolidated personnel administration, joint use of staff, staff transfers, staff-out stationing and collation; (4) planning and programming in terms of development of policies, information sharing and joint evaluation; and (5) administrative support regarding record keeping, grants, management and central control.

Despite these eloquent potential inhibiting factors, tremendous benefits have been identified to be inexhaustible. According to Rossi et al. (1982, p. 12-13), inter-agency coordination can help: (1) improve staff effectiveness; (2) change the image of an organization to the public; (3) improve accessibility to clients; (4) reduce fragmentation of services; and (5) result in greater efficiency. Levine and White (1961, p. 583) wrote that cooperation can help appraise the relationship within and between organizations and be used as a means to encourage all institutions involved to jointly procure necessary resources.

In a study of inter-agency coordination, Tropman (1974, p. 144-145) enunciated that most social scientists have envisaged inter-agency coordination as: (1) a practical technique in trying to develop better relationships between

institutions; (2) a means to develop neighborhood cohesion; and (3) a vehicle to develop a mechanism that can alleviate the underutilization of resources. Aiken and Hage (1972, p. 236-259) studied the causes and consequences of organizational interdependence among health and welfare organizations. Their study confirmed that the emphasis in organizational interdependence has been for the purpose of exchanging resources. In addition, they concluded that this exchange and sharing of resources can be a mechanism for enhancing the inter-agency coordination process and an arena for the inputs and outputs linkage.

Summary:

This review has outlined the importance of collaboration relative to institutional effectiveness. Collaboration has been described as a vehicle that might be used to enhance the impact of organizations. Both advantages and problems associated with collaboration within and between organizations and key steps to alleviate fears were delineated. In this century, the scarcity of resources has constrained many organizations to have a greater impact and to perform their designated functions efficiently. From this perspective, it became necessary to address collaboration relative to the institutions studied - - - the University of Swaziland Faculty of Agriculture and the Malkerns Agricultural Research Station in Swaziland as key institutions to agricultural development.

Problems of Agricultural Production

In recent years, the shortage of food and fiber has become a topical issue. Many governments have shown great concern over the food crisis. Governments of developing countries have been most concerned because of their countries' high vulnerability to the food shortage. According to Axinn and Sudhaker (1972, p. 3); Clausen (1983, p. 2), the shortage of food has presented a dimensional dilemma to the developing nations. The gap between man and his food has kept increasing. In this respect, the governments of developing nations should find effective ways for improving the food situation.

The causes of the food shortage have left governments with mixed feelings. Some believe that the escalating populations of developing nations, severe droughts and the scarcity of resources have all aggravated the food deficit. McNamara (1972, p. 38); Clausen (1983, p. 9) have attested to some of these factors, particularly population growth, drought and the scarcity of resources. Their strong argument was that population in developing countries has increased at a faster pace than the production of food. They wrote that drought has also constrained the production of food and might be the most difficult factor to control.

Other scholars argue that the shortage of food in many developing nations have been caused by a conglomeration of factors. According to Lele (1972, p. 186-187), some of the forces include: (1) underdevelopment of human resources; (2)

political fragility; (3) insecurely rooted and ill-suited institutions; and (4) inefficient utilization of resources. Clausen (1983, p. 130-131) wrote to add more factors which have aggravated food deficit in Sub-Saharan Africa. He pointed out that the lack of administrative procedures to manage agricultural production and the lack of institutions and competent personnel to monitor the process of food production have contributed to the shortage of food and fiber.

Because of the shortage of food and fiber, researchers have been urged to explore effective ways of improving the food deficit. Deliberations on the causes of the food deficit may not be the best approach and solution. In this context, what can researchers do to help agricultural institutions to have a greater impact the production of food? What should governments do to create environments which will be conducive to the production of more food for the nations? Additionally, what should those institutions responsible for the production of food do to more fully help meet needs and interests of people in agriculture?

Summary:

Clearly, the food deficit has created a dilemma and some action should be taken to improve the production of food and fiber. Some of the problems mentioned in the review cannot be resolved immediately by an individual institution. Because some of the forces aggravating the food deficit have

been identified and documented, the need for formulating solutions becomes inevitable. While all the forces are equally important, the inefficient utilization of resources might be one of the most appropriate target that could be enhanced through inter-agency coordination within and between all agricultural institutions. In this context, it became necessary to examine the role of Agricultural Institutions in the production of food with an overview of their primary functions.

The Role of Collaboration in Agricultural Institutions Effectiveness:

At a food security conference held in Swaziland, Contant (1984, p. 1) proposed that faculties of agriculture and agricultural research institutes should cooperate. He enunciated that through cooperation, these institutions might have a greater impact on the production of food and fiber. Specifically, he claimed that collaboration can be a means to help these institutions to: (1) discuss and work together, share tasks and complement each other; (2) make better use of scarce human resources; and (3) exploit the many areas of complementary and avoid duplication. His strong contention was that: educational institutions can benefit from agricultural research institutions in many ways. At the same time, agricultural research institutions can equally benefit from the agricultural education institutions. It was from this point of view that he

concluded that these institutions should collaborate.

He proceeded to delineate specific kinds of benefits that each institution can get from the collaborative arrangement. Faculties of agriculture can benefit from help given by the research institutes in: teaching, tutoring students, supervision of thesis projects, and from the access of the infrastructure of the research institutes. On the other hand, the research institutes can benefit from the educational institutions' specialized resources. These resources might include: (1) laboratories; (2) library facilities; (3) concentrated pool of students that might be used as a vehicle for short-term assignments; (4) a pool of experts; and (5) from the education institutions' ability to attract funding.

In his paper, he assumed that these institutions would be automatically attracted to adopt the collaborative process. He did not provide a theoretical framework around which to build cooperation. His paper lacked the support of a sound theory based on scientific inquiry. However, his articulation of the need for these institutions to cooperate and complement each other whenever possible underscores the concern with food security. His paper has reminded many governments to push for inter-agency coordination within and between agricultural institutions.

The World Bank Agricultural Sector Policy Paper (1981, p. 24-25) revealed several issues regarding agricultural institutions and their management. First, the paper

revealed that there has been a pervasive inadequate appreciation by many governments particularly in the developing nations of the roles that these institutions can play in agricultural development. This has resulted in low priority in terms of budgetary and manpower support. Second, there has been deficient organizational structures for research, extension and teaching (training). As a result of the deficiencies in organizational structures and networking systems, efforts by these institutions have had little impact on agricultural development. The needs and interests of people in agriculture have not been more fully met. The reports unfolded in this paper, were based on practical lessons from developing countries Sub-Saharan Africa being one of them. Wandira (1983, p. 13) affirmed the issue of low budgets of agricultural institutions. He succinctly pointed out that many African institutions' budgets have not grown at a comparable rate as has been the pressure on them to offer additional services.

Idachaba (1980, p. 11) reviewed the evolution and the achievement made by agricultural research in Nigeria. He first examined the allocation of resources to agricultural research. His findings showed an alarming uneven allocation of funds and facilities between agricultural universities and the research institutes. In addition, he concluded that the decline of research to agricultural production was attributed to: (1) lack of research funding; (2) instability in research due to fluctuations; (3) inadequate staff to

conduct research; (4) staff turn-over; (5) lack of research materials and equipment; (6) factors related to socio-political environment; (7) lack of proper research management skills; and (8) lack of effective delivery of research results (p. 26-27). In this perspective, it becomes evident that the impact of reduced funding has been very extensive. It has not only constrained research alone, but has affected other agricultural institutions - - namely: agricultural universities and extension education.

After his elaborate review, he came to the conclusion that there was a need in Nigeria to: (1) improve funding of agricultural research, (2) train more research personnel, (3) build up research capabilities, (4) optimize the use of equipment, and (5) ensure that resources were managed efficiently (p. 29). He also asserted that there was a need to establish a closer functional relationship between research institutes and faculties of agriculture. He envisaged this closer working relationship to be a lead-way toward maximizing the use of resources. He ended his paper by pointing out that deliberations between faculties of agriculture and agricultural research institutes resulted in specific aspects of collaboration. These aspects were pretty much similar to those identified by Contant (1984, p. 4). These notions lead to the next aspect of this literature review - the primary functions of agricultural universities and agricultural research institutes.

Summary:

This brief review has described why and how collaboration between agricultural institutions can be important. With respect to faculties of agriculture and agricultural research institutes, through cooperation, these institutions might be able to enhance their impact on the agricultural sector. They might be able to share resources and complement each other and curtail duplication of efforts. Any overlapping could be appreciative as long as these institutions have established a functional relationship. In the process of working out a formular to help these agricultural institutions to have a greater impact, it became necessary to review their functions.

Overview of Functions of Agricultural Universities and Agricultural Research Institutes:

To understand the dynamics of modern Agricultural Universities and Agricultural Research Institutions and their traditional functions has become a necessity. Otherwise, the researcher may lose sight of the significant roles these institutions can play in agricultural development. Their primary missions have become extremely important. Additionally, the researcher might underestimate pertinent information which could impede these institutions from performing their traditional functions efficiently.

Agricultural Universities have been primarily responsible for the training of agriculturalists; while

Agricultural Research Institutes have specialized in research work. In this century, their functions have increased particularly in faculties of agriculture. Agricultural Universities have come to realize that they cannot confine themselves to the granting of degrees and conduction of ad hoc research. Instead, they now should consider themselves to be committed to the people they are meant to serve as instruments of rural and national development. The need for these institutions to attempt under the constraint of resources to more fully help meet the needs of the people is very critical. Despite the budgetary constraint, Wandira (1981, p. 13) insisted that the university teacher and the research should practice a noble and honest art that of brokerage of ideas, skills and work as a team.

According to the University of Agricultural Science Miscellaneous Series (1971, p. 1) in India, agricultural universities should primarily provide: (1) higher education (training) in the middle areas of agriculture and allied sciences; (2) furtherance of knowledge through systematic research in all agricultural disciplines; and (3) act as a resource base of knowledge gained through research for adoption. Gautum et al. (1972, p. 8) reiterated the same functions and added that agricultural universities should even go beyond the university peripherals to more fully help people with their needs and interests in agriculture.

Regarding Agricultural Research Institutes, Gautum et

al. (1972, p. 17) wrote that these institutes should be entirely responsible for: (1) testing varieties evolved at the central research station and (2) working on coordinated projects pertaining to the area to be covered even by substations. Additionally, Research Institutes should: conduct research in livestock, soil sciences and carry out research work in all facets of agriculture. Results on all the research work should in turn be made available to the extension agents for disseminating the information to the farm families.

Clearly, these institutions have separate functions, however, they are closely related. Research has proved to be complementary to the teaching or training of agricultural technicians using up to date information. At the same time, training of agricultural technicians can help provide more manpower required to conduct research. Because of the significant role that these institutions should play, Stevenson (1981, p. 23) has urged that agricultural institutions should be given a high priority in funding. Admittedly, these institutions do need extra funding, however, speculations are that if they work in isolation, their impact might not be significant. There has been adequate evidence that these institutions have a common mission, agricultural development. They should therefore work toward a systems approach that will make their impact on agricultural and rural development greater.

In recent years, these institutions have received

criticisms that they are not effective as expected. The general feeling has been that they have not made a significant impact on the agricultural sector as they should have. The root cause for these institutions not making as great an impact as expected has been poor management of resources. According to Clausen (1981, p. 9) the mismanagement of resources includes a host of issues such as: inadequate allocation of funds by governments; underdeveloped human resources; political fragility; insecurely rooted and ill-suited institutions and a climate and geography hostile to development. The same issues were underscored by the Ceres Food and Agricultural Organization Review issue (1985, p. 15-17) when it pointed out that agricultural research systems in the third world countries have not only been constrained by the shortage of resources. On top of the limitation of resources, it elaborated that the fragmentation of responsibilities among several ministries and excessive dispersion of resources has always been the cause of these institutions to have a weaker than expected impact on agricultural development. As a result, it has been difficult for these institutions to adopt an intersectorial approach and curtail duplication of efforts.

Lopes (1985, p. 17) shared the same concern on the impact of these agricultural institutions on agricultural development when he reported on the 'Assessment of the Brazilian Experience.' He wrote that when research is undertaken by the research institutes, other federal

agencies, universities and private organizations, it has tended to be loose and have unsystematic intercoordinations. His major concern was the optimum use of resources. He concluded that: uncoordinated research work between institutions would cause resources to be depleted or wasted. In addition, he reiterated that agricultural universities should be actively involved in research along with their primary role of training agricultural technicians. His contention was that: if these institutions can try to coordinate their work, both teaching and research, they might have a greater impact on the agricultural sector.

Summary:

Briefly, the reviewed literature has addressed the concept of a 'theory' as a framework tool in research. Second, three theoretical constructs were identified as a basis for building inter-agency coordination between the University of Swaziland Faculty of Agriculture and the Malkerns Agricultural Research Station. These models emphasize the need for organizations pursuing similar goals to work together in order to have a greater impact.

Third, a general proposition of inter-agency coordination was described. Both advantages and fears in collaboration were extensively covered along with ways which can be adopted to minimize some of the fears and potential barriers to collaboration. Fourth, the subject of inter-agency coordination was narrowed down to the institutions

studied - agricultural institutions. An overview of their primary functions and some criticisms were described.

Finally, this literature review pointed out that a study of these agricultural institutions relative to how they might attempt to enhance their impact on the agricultural industry became necessary. Resources have become very scarce, yet, people are still asking these institutions to more fully meet their needs and interest in agriculture.

CHAPTER 4

RESULTS

In Swaziland, agriculture has remained important as a supply of food and fiber and a source of renewable wealth. As a result of the importance of the agricultural sector, people have asked agricultural institutions to more fully help meet their needs in agriculture. However, because of the scarcity of resources, agricultural institutions have been unable to adequately help people meet their needs and interests in agriculture. Consequently, the government of Swaziland has urged all agricultural institutions to collaborate and work together wherever possible with the intent of optimizing the use of resources. The mode of cooperation and options have not been prescribed for the agricultural institutions to follow.

This study was designed to determine perceptions held by the University Teaching Staff and the Malkerns Research Personnel relative to the possibility for greater cooperation. It was anticipated that an awareness of perceptions of the two staffs may unfold strengths, insights to enhance cooperation and help determine factors that might impede collaboration, and thus, provide additional information upon which healthier collaboration may be built.

Survey results and the researcher's interpretation of the data are presented in a tabular and narrative form in this chapter. The study population was 35 University of Swaziland Faculty of Agriculture Teaching Staff and 30 Malkerns Agricultural Research Personnel; making a total study population of 65. A total of 47 usable questionnaires (72.3 percent) were returned and used in the analysis of the study.

Data were analyzed using the STAT PAC Computer Facilities of the Agricultural and Extension Educational Department of Michigan State University to determine frequencies, means, standard deviations and percentages.

Responses were assigned number values from 1 (Strongly Agree) to 5 (Strongly Disagree). For interpretation purposes, mean values between 1.00 to 2.50 should be considered as indicating agreement. Mean values between 2.51 to 3.50 should be considered as indicating indecision and mean values between 3.51 to 5.00 should be considered as indicating disagreement.

Perceptions of Joint Identification of Research Problem Areas

As can be observed from data in Table 1, nine items were identified under the joint identification of research problem areas to be rated. These items were to be rated by indicating the extent to which the incumbent staffs agreed or disagreed with each statement to being part of the joint

venture in the identification of research problems.

The data in Table 1 indicate that University Teaching Staff and Malkerns Research Personnel were in agreement that: (1) establishing research priorities; (2) distinguishing between basic and applied research; (3) establishing a research committee for the identification of research problems; (4) stipulating completion time frame for research projects; (5) determination of costs of undertaking identified research projects; (6) considering research problems through a problem approach; (7) identifying successful completed projects in other countries; and (8) scheduling regular meetings for considering proposed research projects can be a joint venture under the team effort in the identification of research problem areas. Both institutions' staffs put emphasis on the establishment of research priorities and scheduling regular meetings for considering proposed research projects.

Considering research projects by using a discipline approach and identification of successful completed projects as a basis for setting research priorities, there was a split of opinions. The University Teaching Staff agreed in both cases that these can be part of a joint effort in the identification of research problem areas. While the Malkerns Personnel showed indecision in both cases. Both the University Teaching and the Malkerns Personnel were in agreement overall except for considering research by using discipline approach where they were undecided.

Table 1. Perceptions of Joint Identification of Research Problems as a Possible Area of Collaboration between the University of Swaziland-Faculty of Agriculture (UNISWA) and the Malkerns Agricultural Research Station (MARS) Held by the University Teaching Staff and the Malkerns Research Personnel in Swaziland (N=47).

ITEMS RATED	UNISWA N = 29		MARS N = 18		OVERALL N = 47	
	$\bar{X}$	SD	$\bar{X}$	SD	$\bar{X}$	SD
1. establish research priorities	1.41	0.86	1.56	0.51	1.46	0.74
2. distinguish between basic and applied research in order to ensure that there is a balance	1.82	0.75	2.05	0.93	1.91	0.83
3. establish a joint research committee for identification of research problems	1.41	0.82	2.16	1.29	1.70	1.08
4. stipulate completion time for each research project as a basis for identification of future research projects	1.86	0.83	2.11	0.75	1.95	0.80
5. determine costs of undertaking identified research projects	1.79	0.90	2.38	1.95	2.02	1.05
6. consider research projects by using						
(a) problem approach	1.62	0.82	2.11	1.07	1.80	0.94
(b) discipline approach	2.41	0.90	3.00	1.08	2.63	1.09
7. identify successfully completed research as basis for setting research priorities	1.72	0.92	2.61	1.24	2.06	1.13
8. determine relevant research projects conducted in other countries to be used as basis for identifying research problem areas	2.27	0.99	2.00	0.97	2.17	0.98
9. schedule regular meetings for considering proposed research projects	1.37	0.72	1.94	0.99	1.59	0.87

$\bar{X}$: 1.00 - 2.50 = Agreement; $\bar{X}$: 2.51 - 3.50 = Indecision;
 $\bar{X}$: 3.51 - 5.00 = Disagreement.

Perceptions of Joint Securing of Funds

Data related to the University Teaching Staffs' and the Malkerns Research Personnel's perceptions of joint securing of funds as a possible area of collaboration between the University of Swaziland Faculty of Agriculture and the Malkerns Research Station are presented in Table 2.

Respondents agreed that a joint effort in securing of funds can be achieved by: (1) a joint establishment of a research fund; (2) joint allocation of funds on the basis of research priorities; (3) appointment of a committee for soliciting funds from private industries and international financial institutions; (4) defining procedures for applying for research funds; (5) presenting reports on research spending; (6) ensuring that research projects undertaken are in the interests of national development; (7) establishing links with financial institutions; (8) determining local government funding; and (9) establishing links with similar foreign institutions in order to import desirable funding procedures.

It can be observed from the data in Table 2 that the institutions' incumbent staffs have placed a greater concern over the issue of securing funds as a joint venture. In the table, it can be also noted that both institutions were in agreement with the item that in the event of joint securing of funds, there is a need for the institutions to ensure that research projects for which funds may be asked for, should be in the interest of national development.

Table 2. Perceptions of Joint Securing of Funds as a Possible Area of Collaboration between the University of Swaziland-Faculty of Agriculture (UNISWA) and the Malkerns Agricultural Research Station (MARS) Held by the University Teaching Staff and the Malkerns Research Personnel in Swaziland (N=47).

ITEMS RATED	UNISWA N = 29		MARS N = 18		OVERALL N = 47	
	$\bar{X}$	SD	$\bar{X}$	SD	$\bar{X}$	SD
1. establish a research fund	1.75	1.05	2.05	0.99	1.87	1.03
2. allocate funds on the basis of research priorities	1.41	0.62	1.94	1.05	1.61	0.84
3. appoint a committee for soliciting funds from:						
(a) private industries	1.65	1.01	2.22	0.94	1.87	1.01
(b) international finance institutions	1.72	1.22	1.83	0.70	1.76	1.04
4. define procedures for applying for research funds	1.69	1.00	2.16	1.04	1.87	1.03
5. present regular reports on research spending	1.44	0.78	1.50	0.51	1.46	0.68
6. ensure that research projects are in the interest of national development	1.24	0.57	1.22	0.42	1.23	0.52
7. establish links with international financing institutions	1.48	0.68	1.55	0.70	1.48	0.68
8. determine local government funding as basis for determining the need for extra funding	1.69	0.76	1.94	0.87	1.78	0.80
9. establish links with similar foreign institutions (faculties of agriculture and Research institutions) in order to import desirable funding procedures	1.65	0.72	2.11	0.90	1.83	0.81

$\bar{X}$: 1.00 - 2.50 = Agreement; $\bar{X}$: 2.51 - 3.50 = Indecision;
 $\bar{X}$: 3.51 - 5.00 = Disagreement.

Perceptions of Advancement of Staff

The University Teaching Staff and the Malkerns Personnel were asked to respond to sixteen items concerning their perceptions of the advancement of staffs as a joint effort by the University and the Malkerns Research Station. They were asked to indicate whether they strongly agreed; agreed, undecided, disagreed or strongly disagreed with each of the sixteen items.

Responses dealing with the advancement of staff as a possible area of collaboration are presented in Table 3. Both incumbent staffs were in agreement with all the sixteen statements that they can be aspects of a joint advancement of staffs. The University Teaching Staff indicated more emphasis to: (1) encouraging beginning professionals to read journals and other research reports; (2) scheduling joint workshops for reporting research results; and (3) rewarding staff for distinguished teaching and research as critical issues for a joint advancement of staff.

The Malkerns Research Personnel expressed more emphasis on: (1) joint training of potential staff; (2) encouraging beginning professionals to read journals and other research reports; (3) encouraging professionals to publish locally and in international journals; (4) providing opportunities to staff members to visit other teaching or research institutions outside Swaziland; scheduling joint workshops for reporting research results, and assigning beginning professionals with more experienced individuals.

Table 3. Perceptions of Advancement of Staff as a Possible Area of Collaboration between the University of Swaziland-Faculty of Agriculture (UNISWA) and the Malkerns Agricultural Research Station (MARS) Held by the University Teaching Staff and the Malkerns Research Personnel in Swaziland (N=47).

ITEMS RATED	UNISWA N = 29		MARS N = 18		OVERALL N = 47	
	$\bar{X}$	SD	$\bar{X}$	SD	$\bar{X}$	SD
1. joint training of potential staff	2.03	0.98	1.44	0.78	1.80	0.94
2. joint selection of criteria for staff development	2.13	1.09	2.27	0.82	2.19	0.99
3. joint authorship (i.e. research papers)	1.86	0.83	1.83	0.98	1.85	0.88
4. joint presentation of research results	1.75	0.78	1.83	0.78	1.78	0.77
5. assigning beginning professionals with more experienced individuals	1.62	0.67	1.72	0.82	1.66	0.73
6. encouraging beginning professionals to read journals and other research reports	1.27	0.45	1.50	0.61	1.36	0.52
7. encouraging professionals to publish locally and in international journals	1.48	0.82	1.50	0.61	1.48	0.74
8. joint staff performance evaluation	2.37	1.14	2.16	0.78	2.29	1.02
9. establishing standard procedures for conducting research studies	2.10	1.14	2.22	0.87	2.14	1.04
10. chairing research reporting meetings on rotational basis	2.00	0.88	2.11	0.75	2.04	0.83
11. identifying individual professional interests in research	1.62	0.57	2.11	0.90	1.80	0.79
12. providing opportunities to staff members to visit other teaching and research institutions outside Swaziland	1.48	0.63	1.50	0.78	1.48	0.68
13. scheduling joint workshops for reporting research results	1.31	0.54	1.56	0.58	1.44	0.61
14. joint staff development programmes	1.93	0.79	2.38	0.91	2.10	0.86
15. encouragement of team projects as opposed to individual undertakings	2.00	1.03	2.00	1.13	2.00	1.06
16. rewarding staff for distinguished						
(a) teaching service	1.41	0.73	1.94	0.72	1.61	0.76
(b) research service	1.34	0.72	1.77	0.54	1.51	0.71

$\bar{X}$: 1.00 - 2.50 = Agreement; $\bar{X}$: 2.51 - 3.50 = Indecision;
 $\bar{X}$: 3.51 - 5.00 = Disagreement.

The University Teaching Staff recorded their lowest mean on encouraging beginning professionals to read journals and other research reports. While the Malkerns Research Personnel were in strong agreement with the need to engage in a joint training of potential staff as a mechanism of the advancement of staff.

Perception of Training of Students in Various Agricultural Disciplines

Training of students in various agricultural disciplines was identified as a possible area of collaboration between the University of Swaziland and the Malkerns Agricultural Research Station, the primary purpose being to help enhance the impact of these institutions on agricultural development. Seventeen items were identified and respondents were asked to rate these items according to their individual opinions.

Information contained in Table 4 reflects opinions of University Teaching Staff and Malkerns Research Personnel regarding a joint effort in training students in various agricultural disciplines. Data show that respondents consider the training of students in various agricultural disciplines at varying degrees. The University Teaching Staff consider the following items to be most critical: (1) Helping students identify dissertation topics; (2) Holding agricultural seminars. While the Malkerns Research Staff also considered the holding of agricultural seminars as most

appropriate for the joint effort in training students in various agricultural disciplines.

The University Staff also considered; (1) teaching of some courses; (2) tutoring degree students; (3) supervising students' dissertations; (4) using degree students to collect data during field training; (5) supervision of students during field training; (6) conducting demonstrations; (7) writing research papers; (8) developing professionals in agriculture; and (9) attending oral examinations by degree students to be extremely essential as a mechanism for a joint effort in training students in various agricultural areas.

Information in Table 4 indicates that the Malkerns Research Personnel considered the following as essential aspects of a collaborative effort in training agricultural students: (1) teaching some courses; (2) helping identify dissertation topics; (3) supervising students' dissertations; (4) using degree students to collect data during their field training course; (5) supervising students during field training; (6) conducting agricultural demonstrations; (7) curriculum review; (8) writing research papers; and (9) developing professionals in agriculture.

As can be observed in the table, both institutions' staffs were indecisive regarding: (1) Setting of final examinations and (2) Reviewing students academic records. The University Teaching Staff was also undecided whether or not screening candidates planning to enroll in agriculture

Table 4. Perceptions of Training of Students in Various Agricultural Disciplines as a Possible Area of Collaboration between the University of Swaziland-Faculty of Agriculture (UNISWA) and the Malkerns Agricultural Research Station (MARS) Held by the University Teaching Staff and the Malkerns Research Personnel in Swaziland (N=47).

ITEMS RATED	UNISWA N = 29		MARS N = 18		OVERALL N = 47	
	$\bar{X}$	SD	$\bar{X}$	SD	$\bar{X}$	SD
1. teaching some courses	1.89	1.04	1.72	0.59	1.83	0.89
2. tutoring degree students	1.79	0.81	2.38	1.03	2.02	0.94
3. helping students identify dissertation topics	1.34	0.48	1.88	0.96	1.55	0.74
4. supervising students' dissertation projects	1.75	0.91	1.83	0.70	1.78	0.83
5. using degree students to collect data during field extension training	1.79	0.72	1.77	0.64	1.78	0.69
6. supervising students during field extension training	1.89	1.01	1.77	0.64	1.85	0.88
7. conducting agricultural demonstrations	1.62	0.90	1.77	1.00	1.68	0.93
8. (a) reviewing curriculum	2.27	1.61	1.94	0.72	2.14	1.02
(b) designing curriculum	2.41	1.18	2.00	0.68	2.25	1.03
(c) developing curriculum	2.24	1.21	2.00	0.76	2.14	1.06
9. holding agricultural seminars	1.37	0.49	1.44	0.51	1.40	0.49
10. writing short research papers	1.51	0.63	1.50	0.51	1.51	0.58
11. developing professionals in agriculture	1.65	0.72	1.77	0.73	1.70	0.72
12. attending oral examination (thesis defense by degree students)	1.72	1.06	2.33	1.02	1.97	1.08
13. setting final examinations	2.89	1.34	2.94	0.99	2.91	1.21
14. identifying potential teaching & research staff	2.13	0.99	2.22	0.73	2.17	0.89
15. screening candidates applying to enroll in agriculture	3.06	1.25	2.50	1.09	2.85	1.21
16. advising degree students	2.10	0.77	2.33	0.76	2.19	0.77
17. reviewing students' academic records	3.20	1.14	2.72	1.79	3.02	1.17

$\bar{X}$: 1.00 - 2.50 = Agreement; $\bar{X}$: 2.51 - 3.50 = Indecision;
 $\bar{X}$: 3.51 - 5.00 = Disagreement.

should be part of the joint effort plan in training students in agricultural areas. Overall, both institutions' staffs underscored the holding of agricultural seminars as an important aspect of training agricultural students. Data show that they had doubts about setting final examinations and reviewing students academic records. Screening candidates also stood at the edge of questionable aspects of joint effort in training agricultural students.

Perceptions of Sharing of Infrastructure and Physical Facilities

Both infrastructure and physical facilities which can be shared by the University of Swaziland Faculty of Agriculture and the Malkerns Agricultural Research Station were compiled. University Teaching Staff and Malkerns Research Personnel were asked to respond to these items by indicating to what extent they agreed or disagreed with each statement as a means of inter-agency coordination between the Faculty of Agriculture and the Agricultural Research Station in Swaziland.

Data in Table 5 present the responses of the two institutions' staffs. University Teaching Staffs agreed that the following infrastructure and physical facilities can be shared as a basis for collaboration: (1) laboratory; (2) Library; (3) land; (4) farm Machinery and Equipment; (5) livestock; (6) data analysis facilities; (7) soil analysis facilities; (8) visual and audio-visual equipment; (9)

Table 5. Perceptions of Sharing Infrastructure and Physical Facilities as a Possible Area of Collaboration between the University of Swaziland-Faculty of Agriculture (UNISWA) and the Malkerns Agricultural Research Station (MARS) Held by the University Teaching Staff and the Malkerns Research Personnel in Swaziland (N=47).

ITEMS RATED	UNISWA N = 29		MARS N = 18		OVERALL N = 47	
	$\bar{X}$	SD	$\bar{X}$	SD	$\bar{X}$	SD
1. laboratories						
(a) equipment	1.41	0.78	2.11	1.13	1.68	0.98
(b) miscellaneous laboratory facilities	1.34	0.61	2.00	0.97	1.59	0.82
2. library						
(a) documentation equipment	1.24	0.51	2.00	0.97	1.53	0.80
(b) storing facilities	1.82	1.07	2.22	1.00	1.97	1.05
3. transportation						
(a) trucks	2.72	1.22	3.27	1.27	2.93	1.25
(b) vans	2.69	1.25	3.22	1.35	2.89	1.30
(c) buses	2.72	1.25	3.00	1.23	2.83	1.23
4. land						
(a) farm plots	2.20	1.14	2.44	1.14	2.29	1.14
(b) experimental plots	2.03	1.05	2.38	0.97	2.17	1.02
(c) museum plots	2.06	0.92	2.55	0.84	2.25	0.96
(d) grazing land	2.55	1.15	2.72	1.34	2.60	1.22
5. farm machinery and equipment	2.04	0.98	2.44	1.09	2.19	1.03
6. buildings						
(a) staff houses	2.75	1.18	3.38	1.09	3.00	1.80
(b) offices	2.82	1.03	3.00	1.13	2.89	1.06
(c) lecture halls	2.17	0.84	2.50	1.24	2.29	1.02
7. livestock for						
(a) experimental purposes	2.06	0.94	2.33	1.18	2.17	1.04
(b) demonstration purposes	1.89	0.90	2.22	1.35	2.02	1.09
8. data analysis facilities	1.31	0.54	1.77	1.06	1.48	0.80
9. soil analysis equipment	1.48	0.82	1.88	1.07	1.63	0.94
10. labourers						
(a) secretarial services	2.96	1.05	3.61	1.29	3.21	1.17
(b) unskilled services	2.96	1.01	3.50	1.33	3.17	1.16
11. visual and audio visual equipment	1.79	0.861	2.16	0.92	1.93	0.89
12. irrigation equipment	2.31	1.31	2.55	1.24	2.04	1.28
13. miscellaneous						
(a) researching software	1.69	0.80	2.83	1.20	2.12	1.15
(b) teaching software	1.72	0.79	2.66	1.18	2.08	1.06
14. professional staff personnel	1.69	0.85	2.11	0.96	1.85	0.90
15. recreational facilities	1.89	0.93	2.05	1.21	1.95	1.04

$\bar{X}$: 1.00 - 2.50 = Agreement; $\bar{X}$: 2.51 - 3.50 = Indecision;
 $\bar{X}$: 3.51 - 5.00 = Disagreement.

professional staff; and (10) recreational facilities.

Malkerns Research Staff also agreed with the same items to be basis for establishing an inter-agency coordination process between the University and the Malkerns Research Station. They differed on the sharing of land-museum; irrigation equipment and miscellaneous research and teaching software. The University Teaching Staff agreed that: (1) museum plots; (2) irrigation equipment; and (3) miscellaneous research and teaching software can be shared. While the Malkerns Research Personnel were undecided about the sharing of both: (1) museum plots and (2) irrigation equipment. With respect to the sharing of miscellaneous research and teaching software, Research Personnel disagreed that this can be a basis of collaboration between the two institutions.

Regarding the sharing of: transport, buildings and laborers, both the University Teaching Staffs and the Malkerns Research Personnel indicated indecision. As can be observed in the table, the Malkerns Research Personnel ruled out the idea of sharing secretarial services and undecided about sharing of unskilled laborers. In both cases, the University Teaching Staffs were undecided.

Overall, the respondents more or less maintained the same pattern of agreements, indecision and split of opinions. Irrigation equipment and sharing of miscellaneous research and teaching software were the only ones which tended to shift more toward agreement, yet the incumbent

staffs had a split in opinions. Information in Table 5 shows that both institutions' staffs were in agreement that under buildings, lecture halls can be shared.

Perceptions of Impeding Factors to Collaboration

The difficulty faced by organizations wanting to engage in an inter-agency coordination process has been widely recognized. In this context, seventeen potential inhibitors were identified and respondents were asked to indicate as to what extent they perceived these seventeen identified forces as potential impeding factors to collaboration between the University and the Research Station in Swaziland.

Information in Table 6 presents the responses of the two institutions' incumbent staffs. As can be observed from the data in the table, the University Teaching Staffs and the Malkerns Research Personnel hold more or less similar opinions on many and different opinions on others.

University Teaching Staff and Malkerns Research Personnel agreed that the following issues can impede effort for inter-agency coordination between the Faculty of Agriculture and the Research Station: (1) Differences in institutional policies; (2) Lack of joint frequent meetings; (3) Lack of sharing short and long-term teaching and research objectives; (4) Differences in staff allegiance; (5) Political consideration; (6) Lack of joint united front for pushing team efforts; (7) Differences in terms of employment and benefits conditions; (8) Difficulty in joint

Table 6. Perceptions of Impeding Factors to Collaboration between the University of Swaziland-Faculty of Agriculture (UNISWA) and the Malkerns Agricultural Research Station (MARS) Held by the University Teaching Staff and the Malkerns Research Personnel in Swaziland (N=47).

ITEMS RATED	UNISWA N = 29		MARS N = 18		OVERALL N = 47	
	$\bar{X}$	SD	$\bar{X}$	SD	$\bar{X}$	SD
1. physical distance between the institutions	3.65	1.37	3.16	1.20	3.46	1.31
2. differences in institutional policies	2.13	1.21	2.38	1.45	2.23	1.18
3. staff turn-over	2.20	1.01	2.61	0.97	2.36	1.00
4. lack of frequent joint meetings	2.34	1.23	2.05	0.99	2.23	1.14
5. lack of sharing						
(a) short term teaching & research objectives	2.34	1.23	2.05	1.05	2.23	1.16
(b) long term teaching & research objectives	2.17	1.13	2.05	0.99	2.12	1.07
6. fear of loss of autonomy	2.41	1.08	2.55	1.42	2.46	1.21
7. differences in staff allegiance	2.41	1.15	2.27	1.27	2.36	1.18
8. political considerations (e.g. unnecessary government interference)	2.34	1.07	2.33	1.18	2.34	1.10
9. institutional territories (turf)	2.72	1.03	2.55	1.09	2.66	1.04
10. lack of a joint united front for pushing team efforts (e.g. government policy)	2.34	0.97	2.27	0.95	2.31	0.95
11. difficulty in identifying research problem areas in the interest of both institutions	3.10	1.11	2.38	1.24	2.84	1.20
12. international influences in terms of funding	3.03	1.05	2.33	1.18	2.76	1.14
13. parallels between teaching and research	2.79	1.01	2.55	1.24	2.70	1.10
14. conflicting interest groups	2.48	1.09	2.55	1.24	2.51	1.14
15. differences in terms of						
(a) employment conditions	2.27	1.16	1.77	1.11	2.08	1.15
(b) benefits conditions	2.37	1.20	1.77	1.14	2.14	1.19
16. difficulty in joint appointment	2.31	1.00	2.00	1.02	2.19	1.01
17. professional						
(a) biases	2.41	0.82	2.05	1.16	2.27	0.97
(b) stereotypes	2.41	0.86	2.22	1.16	2.34	0.98

$\bar{X}$: 1.00 - 2.50 = Agreement; $\bar{X}$: 2.51 - 3.50 = Indecision;
 $\bar{X}$: 3.51 - 5.00 = Disagreement.

appointment; and (9) Professional biases and stereotypes.

Data in the table show that both the University Teaching Staff and the Malkerns Research Personnel were indecisive as to whether or not institutional territories or turf and parallels between teaching and research can impede collaboration. They differed on the question of physical distance being an impeding factor. The University Teaching Staff disagreed that physical distance can be an inhibitive factor. Malkerns Research personnel were indecisive on this issue.

The University Teaching Staff were in agreement that staff-turn-over can curtail collaboration. The Malkerns Research Personnel expressed indecision. Regarding fear of loss of autonomy, there was a split in opinions. University Teaching Staffs felt that this can be an impeding factor while Malkerns Research Staff indicated undecidedness.

As can be observed in Table 6, there was a split of opinions regarding: (1) difficulty in identifying research problem areas in the interest of both groups; (2) international influences in terms of funding; and (3) conflicting interest groups. University Teaching Staff were undecided whether or not identification of research problem areas and international financing institution can impede collaboration. While with the conflicting interest groups, University Teaching Staff were in agreement that this factor might inhibit collaboration.

The Malkerns Research Personnel were in strong

agreement that the difficulty in identifying research problem areas which can be in the interest of both institutions and international influences in terms of funding can make it difficult for the two institutions to collaborate. They further agreed that conflicting interest groups can be a hindrance to collaboration.

Overall, the data in the table, show that University Teaching Staff and Malkerns Research Personnel were in agreement on most factors as inhibitive to collaboration, fewer indecision and one disagreement.

In addition to the data presented in tables 1-6, participants in this study were encouraged to offer comments and/or suggestions for the design of some efforts which might help strengthen the two institutions' working relationship. Their comments and/or suggestions were edited and are individually presented in appendices F and G. Following is a brief description of these comments and/or suggestions.

University Teaching Staff: Most teaching staff considered the proposition of cooperation between the University of Swaziland and the Malkerns Research Station to be of fundamental importance. A recommendation was made that a workshop should be initiated and involve the Faculty of Agriculture, Malkerns Research Station and donor agencies to discuss some of the bottlenecks and to sensitize all incumbent staffs to the necessity for inter-agency coordination. One respondent commented that there is a need

to carefully orient funding institutions about institutional policies. Some teaching staffs recommended that there is a need to consider positive achievements which were made during the time when the two institutions had established a linkage. "Capitalizing on the negative encounters, cannot be of any help," remarked one teaching staff. University Teaching Staff expressed that cooperation might help students to relate theory to real life situation. Furthermore, they expressed more desire to see a closer working relationship which in turn, might even help in the revision of curriculum.

Many teaching staff expressed a need to dove-tail the goals of the University's Faculty of Agriculture and the Malkerns Agricultural Research Station in order to aim for a joint venture that will make these institutions to have a greater impact. A comment was raised that the Government of Swaziland need to intervene and give more financial support to both institutions in order to reduce outside dependence because international developmental agencies might have an unwelcome influence.

The need for the two institutions to work out a formula that will meet the Government's demand for the judicious utilization of resources by agricultural institutions was expressed. University Teaching Staff considered the sharing of infrastructure and physical facilities to be a possible framework for building up inter-agency coordination. The will of all incumbent staffs in both institutions to work

toward collaboration was regarded as most critical. In addition, some Teaching Staff commented that it would be necessary to have each institution send a representative to attend institutional meetings.

Malkerns Research Personnel: Most of the Malkerns Research Personnel perceived the idea of collaboration as an invaluable venture between the University of Swaziland and the Research Station. A suggestion was made to the effect that potential interest groups such as private sectors should be involved in funding research projects. One person recommended that a coordinating individual should be appointed to oversee the networking between the University and the Research Station. Encouraging students to write their dissertations using current information from on going research was suggested.

Malkerns Research Personnel forwarded that: emphasis should be placed also on person to person collaboration and that it is necessary to carefully decide what facilities might be shared by the two institutions. One person commented that there are no uglier fights than to fight over such items as cars, money and teaching or research facilities. Some Staffs remarked on the need to have an inventory of resources each institution has so that any planned sharing cannot end up being a fight over resources.

A suggestion was made that there is need to build up a manpower or capital base in order to strengthen the proposed linkage. The need for the top administrative sections - the

Ministry of Agriculture and Cooperatives and the Ministry of Education to dialogue on this subject was underscored. The need for working out a formula that will enhance a joint relationship was considered to be essential for the identification of replacement staff and that a networking system might help facilitate working on cooperative research trial initiation, management and analysis.

CHAPTER 5

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

Summary:

This study was designed to: (1) determine the perceptions of potential collaboration on selected areas between the University of Swaziland Faculty of Agriculture and the Malkerns Agricultural Research Station in Swaziland; (2) determine impeding factors to collaboration; (3) elicit comments and/or suggestions from University Teaching Staff, and to (4) provide additional information on which to build cooperation between the University's Faculty of Agriculture and Malkerns Research Station so that these institutions can have a greater impact on agricultural development.

The descriptive method of research using the questionnaire technique was used in this study. Questionnaires were developed following a literature review in order to meet the objectives of the study. One type of questionnaire was prepared and mailed to a lecturer in the University of Swaziland Faculty of Agriculture who in turn, distributed the questionnaires to 35 University Teaching Staffs and 30 Malkerns Research Personnel. Questionnaires were subsequently returned by 47 of the respondents (29 University Teaching Staffs and 18 Malkerns Research

Personnel) which was 72.3 percent.

Data were analyzed using the STAT PAC Computer facilities of the Agricultural and Extension Education Department at Michigan State University to determine frequencies, means, percentages and standard deviations.

Findings of the Study

Findings of the study are summarized as follows:

1. University Teaching Staffs and Malkerns Research Personnel agreed that joint identification of research problem areas can be a potential approach to building collaboration between the University of Swaziland Faculty of Agriculture and the Malkerns Agricultural Research Station.
2. University Teaching Staffs tended to strongly agree on most items under joint identification of research problems and were somewhat in agreement with: (1) considering research projects by discipline approach and (2) determining relevant research projects conducted in other countries to be used as a basis for identifying research problem areas.
3. Malkerns Research Personnel exhibited somewhat agreement with most statements and were indecisive about: (1) considering research by discipline and (2) identifying successfully completed research projects as a basis for setting research priorities under joint identification of research projects.
4. Perceptions of respondents regarding the sharing of

funds as a means to collaboration, indicate that:

- a. Both University Teaching Staffs and Malkerns Personnel were in strong agreement with: ensuring that all research projects should be in the interest of national development with their means at 1.24 and 1.22 respectively.
 - b. University Teaching Staff tended to strongly agree on all items with their means below 2.00.
 - c. Malkerns Research Personnel shifted more toward strongly agreeing.
5. University Teaching Staff and Malkerns Research Personnel more strongly agreed with most statements listed under advancement of academic staff as a joint venture with fewer somewhat agreements. Both institutions' incumbent staffs indicated more emphasis in: scheduling a joint workshop for reporting research results that it can be an innovative way of academic staff growth and an effective means of collaboration. Furthermore, each group had its own emphasis. University Teaching Staff underscored:
- a. the need to encourage beginning professionals to read journals and other research reports.
 - b. providing opportunities to staff members to visit other teaching and research institutions outside Swaziland.
 - c. rewarding staff for distinguished teaching or research services.

Malkerns Research Personnel, emphasized:

- a. joint training of potential staff.
 - b. the need to encourage beginning professionals to read journals and other research reports.
 - c. providing opportunities to staff members to visit other teaching and research institutions outside Swaziland.
6. University Teaching Staff and Malkerns Research Personnel recorded their opinions to be in agreement with the adoption of training of students in various agricultural disciplines as an effort toward building collaboration between the University of Swaziland and Malkerns Agricultural Research Station. Holding joint agricultural seminars was considered by both institutions to be the best training method and can enhance the proposed joint venture.
7. With regard to sharing of infrastructures and physical facilities, respondents felt that:
- a. there are infrastructures and physical facilities which can be shared and there are those which may not be easy to share.
 - b. it is sometimes not easy to share transport, laborers and buildings.
8. Where University Teaching Staff felt ready and eager to share certain infrastructures and physical facilities, Malkerns Research Personnel indicated reluctance. There were items where both incumbent staffs were not decided

whether or not to share those infrastructures or physical facilities.

9. Malkerns Research Personnel felt very strongly that data and soil analysis facilities should be shared.

10. Respondents reflected their opinions on the potential impeding factors to collaboration in the following aspects:

a. University Teaching Staffs were somewhat agreeable that nearly all the factors may be inhibitive to collaboration except only four where they were indecisive whether or not these might be bottlenecks. These four factors include: (1) physical distance between the institutions; (2) difficulty in identifying research problems which will be in the interest of both institutions; (3) international influences because of their funding support; and (4) parallels between teaching and research.

b. Malkerns Research Personnel strongly felt that differences in terms of: (1) employment conditions and (2) benefits between the two institutions can block efforts to build up an inter-agency coordination process. Their responses indicated a mild agreement except six items where they seemed not sure. Like the University Teaching Staff, the Malkerns Research Personnel were: (1) doubtful about the physical distance between the two

institutions to be a potential impeding factor (2) undecided whether or not staff turn-over, fear of loss of autonomy, institutional territories or turf, parallels between teaching and research, and conflicting interests groups might all be bottlenecks to collaboration between the University and the Malkerns Research Station.

Conclusions

From analysis of information obtained from forty-seven University Teaching Staffs and Malkerns Research Personnel in Swaziland, the following conclusions were drawn:

1. University Teaching Staff and Malkerns Research Personnel have positive opinions toward collaboration on selected areas between the University of Swaziland Faculty of Agriculture and the Malkerns Agricultural Research Station. These positive perceptions held by the institutions' incumbent staffs are indicative that their institutions are eager to more fully help meet the needs of people in agriculture. However, these positive perceptions need to be complemented and supported in order to help these institutions to have a greater impact on the agricultural sector.

2. The perceptions of collaboration on selected aspects between the University of Swaziland and the Malkerns Agricultural Research Station held by University Teaching Staff and Malkerns Research Personnel present an opportunity for further deliberations to help build up a healthier

functional relationship between the two institutions.

3. In terms of the selected areas of collaboration-namely: joint (1) identifying of research problems; (2) securing of funds; (3) advancing of staff and personnel; (4) training of students in various agricultural areas; and (5) sharing of infrastructures and physical facilities there were areas of agreements, indecisions and disagreements between the respondents. Therefore, it is necessary to consider each category very seriously to avoid a problematic inter-agency coordination process.

4. By virtue of the incumbent staffs' agreement with some aspects of collaboration, this shows that incumbent staffs are aware of their institutions' significant role in agricultural development. Furthermore, their opinions are indicative that these organizations have some potential commonalities. They often can use similar input resources to achieve a common goal and therefore effort should be expended to improve these institutions working relationship.

5. The perceptions of collaboration held by the University Teaching Staff and the Malkerns Research Personnel are very critical relative to the notion and theories by Gautum et al., (1972. p. 1); Cleland and King (1983, p. 21); Mulford and Klonglan (1979, p. 4-5). These institutions are keen for performing their jobs effectively and efficiently as submitted by Hall (1972, p. 10-11). The possible solution to helping them achieve this can be through recognizing each institutions as a companion and

complementary, an arena where inputs interact with outputs, and only through a team effort can these institutions have a greater impact.

6. A conclusion can be made that there are infrastructures and physical facilities that cannot be shared easily. In this context, incumbent staffs of both institutions indicated which are some of those items that can be difficult to share. Therefore, their tagging of these -- transport, some buildings, irrigation equipment and miscellaneous research and teaching software should be taken into consideration when establishing collaboration between these institutions.

7. In terms of potential impeding factors to collaboration, it was affirmed by the respondents that there can be a host of inhibiting factors to collaboration between the University and the Malkerns Agricultural Research Station. The conclusion drawn is that these potential inhibitors can be surmounted. In addition, respondents were doubtful about: (1) physical distance between the University and the Research Station; (2) existence of institutional territories or turf; and (3) whether there is some parallels between teaching and research to be potential impeding factors to collaboration. This leads to the conclusion that what might be considered as a potential inhibiting force is not necessarily one.

8. Incumbent staffs' opinions regarding collaboration between the University of Swaziland Faculty of Agriculture

and the Malkerns Agricultural Research Station on selected aspects confirm the potential benefits envisioned by Contant (1984, p. 1) between faculties of Agriculture and Agricultural research institutes.

9. Both University Teaching Staff and the Malkerns Research Personnel are aware of the need for the two institutions to collaborate on areas of common interest so that they can increase their impact and optimize the use of resources.

10. Perceptions held by the University Teaching Staff and the Malkerns Research Personnel with regard to collaboration between the two institutions alone may not be enough, external efforts, such as from the government, may be necessary to expedite the establishment of a healthier inter-agency coordination process.

Recommendations

On the basis of the analysis of responses of University Teaching Staff and Malkerns Research Personnel, their comments and/or suggestions, and ideas from the reviewed literature many recommendations can be made for helping the University of Swaziland Faculty of Agriculture and the Malkerns Agricultural Research Station to enhance their working relationship so that they may have a greater impact on agricultural development in Swaziland. The most significant suggestions are presented below:

1. The University of Swaziland and the Malkerns

Research Station should initiate a workshop that will involve the Faculty of Agriculture, Malkerns Research Station and donor agencies to discuss some of the bottlenecks and to sensitize all the incumbent staffs to the necessity for inter-agency coordination. Hopefully, this workshop will be viewed as a problem diagnosis and formulation of solutions in order to enhance the functional relationship between these parties.

2. There is a need for the top management personnel of these institutions - - the University of Swaziland and Malkerns Research Division to arrange for an open dialogue with their umbrella sections the Ministry of Agriculture and Cooperatives and the Ministry of Education in order to categorically spell out the importance of improving the functional relationship between the University of Swaziland and Malkerns Research Station.

3. There is a need for each institution to take an inventory of existing teaching and/or research facilities so that accurate information can be obtained relative to what resources each institution has. The notion that resources have become scarce is critical, but, what is available should be used efficiently.

4. The government of Swaziland has always encouraged all agricultural institutions to judiciously use resources. However, no formula has been forwarded to these institutions for adoption with the intent of optimizing the use of resources. In this context, the need for the Government to

review policies governing these institutions studied becomes inevitable. The purpose of the review should be to align the policies such that all agricultural institutions begin to realize that their ultimate goal is one - - agricultural development.

5. Both University Teaching Staffs and Malkerns Research Personnel are aware of the need to collaborate on selected aspects as they have indicated in their responses. From this point of view, each institution should study very closely internal networking systems so that an inter-agency coordination venture cannot be jeopardized by intra-institutional conflicts.

6. Respondents underscored among other things two most significant ideas: (1) joint workshops as appropriate to training of student in agriculture and (2) ensuring that conducted research be in the interest of national development. On the basis of this feeling, the two institutions should consider the need for reviving the joint seminars which used to take place while these institutions were married. In addition, a close eye should be kept on the kinds of research which may be going on at both institutions in order to make sure that they are in the interest of national development. Universities are said to be responsible for carrying out ad hoc research whose results are never made available for public use.

7. The study paid focus to the University and the Research Division. Yet, three institutions are essential

stakeholders in the area of agricultural development. These are: Faculties of Agriculture, Research Institutes and Ministries of Agriculture. In this respect, a massive nation wide study should be conducted to determine their opinions regarding the proposition of adopting an inter-agency coordination and networking system in order to make their impacts much greater.

8. On top of the three interest groups enumerated above in # 7, there is a need to include private agricultural institutions in the process of working out a formular for a networking system in agricultural institutions.

9. Incumbent staffs from both institutions should be given opportunities to visit other similar institutions preferably within Africa to observe how other institutions have built up a networking system among agricultural institutions in order to enhance their impact on agricultural development.

10. Finally, the issue of resources goes as far as staff development which might be lacking at both institutions. In this perspective, it becomes necessary for the two institutions also to consider a joint staff development program.

Recommendations for Future Research

Since this study was considered to be the first of its kind, and a continuous search for ways to help agricultural institutions and even other institutions aiming at national

development to optimize the use of resources and to have a significant impact, it is imperative to forward recommendations for future research.

1. A similar study should be conducted in another country to find out if the same results could be ascertained.
2. More efforts should be expended to determine perceptions of collaboration held by administrators and policy makers. Establishing their intelligent discernment can be used as a basis for building inter-agency coordination within and between many institutions pursuing similar goals and interests.
3. There is a need to study factors which might inhibit collaboration within and between organizations particularly those pursuing similar goals so that effective ways to alleviate the inhibitors to collaboration can be identified.
4. There is a need to conduct a similar study with already collaborating institutions in order to evaluate the successes and dilemmas of establishing inter-agency coordination. Establishing both the successes and failures can help other countries to adopt those successful approaches and curb the barriers to inter-agency coordination.

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Appendix A



DEPARTMENT OF AGRICULTURAL & EXTENSION EDUCATION

410 AGRICULTURE HALL • MICHIGAN STATE UNIVERSITY
EAST LANSING, MICHIGAN 48824-1039
(517) 355-6580

December 19, 1984.

Mr. Joseph G. Kariuki
University of Swaziland
Faculty of Agriculture
P.O. Luyengo
Swaziland

Dear Sir:

I am writing to request your help in conducting research at the University of Swaziland - Faculty of Agriculture and the Agricultural Research Division of the Ministry of Agriculture and Cooperatives in Swaziland. My aim is to examine the present collaboration between these institutions and its effectiveness. Secondly, to solicit opinions of lecturers and agricultural research staff regarding collaboration between the two institutions. Upon receipt of their views, opinions and suggestions, I will forward recommendations for a more healthier linkage arrangement between the Faculty of Agriculture and the Agricultural Research Division.

I am planning to send the questionnaires to you and then in turn, you send them to all University - Faculty of Agriculture and Agricultural Research Staffs. The questionnaires will be returned to you by all the staffs and then you send them to me. The postage involved will be taken care of by the undersigned. The help of the chief research officer, particularly in sending and collecting the questionnaires, might expedite the exercise. In this connection, I will attach a covering letter to the questionnaires.

Please let me know at the earliest possible time, if this is agreeable with you.

I believe this study will be beneficial to me in meeting the requirement for the degree of Master of Science and even more important, it will be very valuable to Swaziland as well.

Very truly yours

Musa M.A. Dube

MMD:ba

cc: Fred J. Peabody (Advisor)
Jake Wamhoff (Department Chairperson)
Dean of Graduate Studies

Appendix B

University of Swaziland

TEL. BALKEMERS 03021/2/2/4
TELEX 2007 WB

LUTENGO CAMPUS
P.O. LUTENGO

March 4, 1985.

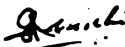
Dean of Graduate Studies,
College of Agriculture and Natural Resources,
Michigan State University,
East Lansing,
Michigan 48824-1039
U.S.A.

Dear Sir,

Masa M.A. Dube who is at present a graduate student in your Department of Agricultural and Extension Education would like to undertake a study on "Collaboration between the University of Swaziland's Faculty of Agriculture and the Agricultural Research Division of the Ministry of Agriculture & Co-operatives as perceived by lecturers and agricultural research staff". The intended study would constitute partial fulfilment of the requirements for his Masters degree.

In this connection, he has requested me to coordinate the distribution and collection of his questionnaires from selected respondents and I have agreed to do so. I am a colleague of his in our Faculty of Agriculture's Academic Staff. I trust that this letter will be of some use in expediting the initiation of his study.

Yours sincerely,



J.G. Karinkki. M.Sc.

Lecturer, Department of Agric. Economics,
Extension and Education.

Appendix C



DEPARTMENT OF AGRICULTURAL & EXTENSION EDUCATION

410 AGRICULTURE HALL • MICHIGAN STATE UNIVERSITY
EAST LANSING, MICHIGAN 48824-1039
(517) 335-6560

February 11, 1985

Mr. Christopher Nkwanyane
Chief Research Officer
Malkerns Agricultural Research Division
P.O. Malkerns.
Swaziland.

Dear Sir:

Prior to my departure for Michigan State University, I discussed with you (6.6.84) my interest to conduct a study on "Collaboration between the University of Swaziland - Faculty of Agriculture and the Agricultural Research Division of the Ministry of Agriculture and Cooperatives."

In this respect, I have asked Joseph G. Kariuki in the University - Faculty of Agriculture to coordinate the study to which he has agreed. I have assured him that your assistance in distributing and collecting the questionnaires will expedite the exercise. It is in this connection that I write you this letter to appeal for your cooperation.

I believe this study will be beneficial to me in meeting the requirement for the degree of Master of Science and even more important, it will be very valuable to Swaziland as well.

Thanking you in advance for your cooperation in this study.

Very truly yours,

Musa M.A. Dube

MMAD:mp

cc: Fred J. Peabody (Academic Advisor)
Jake Wamhoff (Department Chairperson)
Dean of Graduate Studies

Appendix D

University of Swaziland

TEL. MALKERNS 83021/2/3/4
TELEX: 2087 WD

LUYENGO CAMPUS
P.O. LUYENGO

August 21, 1985.

TO: UNIVERSITY TEACHING STAFF
MALKERNS AGRICULTURAL RESEARCH STAFF

FROM: Joseph G. Kariuki
Musa M. A. Dube

RE: Potential Cooperation Between the University of Swaziland
-Faculty of Agriculture and the Malkerns Agricultural
Research Station.

Musa Dube is conducting a study on 'PERCEPTIONS OF UNIVERSITY OF SWAZILAND TEACHING FACULTY AND MALKERNS AGRICULTURAL RESEARCH STAFF REGARDING POTENTIAL COOPERATION BETWEEN THESE TWO INSTITUTIONS.' The overall purpose of his study is to : elicit opinions of both faculty and agricultural research staff regarding possibilities for greater cooperation between the Faculty of Agriculture and the Malkerns Agricultural Research Station in Swaziland.

For this reason, Musa has asked me to assist him in conducting the study. The enclosed opinionnaire has been designed to provide you an opportunity to give your opinion about several ways the two institutions might work together. Your opinions are important for the design of any plan for possible cooperative efforts. Your response will be kept confidential and you will remain anonymous. Please do not write your name on the questionnaire. Your participation in this study is voluntary. There is no penalty for not participating in this study.

Instructions are provided within each section of the opinionnaire and it should take approximately 30 minutes for you to complete this task.

Thank you for your immediate attention to this matter. Please return completed opinionnaire by September 30, 1985 so that I can forward them to Mr. Dube at Michigan State University. I am sure that he will appreciate your participation in this study.

Appendix E

PART I

INSTRUCTIONS:

Please circle the number next to the item which corresponds most closely to your personal data.

A. PERSONAL DATA

I. Name of your employment Institution

- (1) University of Swaziland - Faculty of Agriculture
- (2) Malkerns Agricultural Research Station
- (3) Other (Specify)_____

II. Capacity of Employment (title)

- (1) Professor
- (2) Senior Lecturer
- (3) Lecturer
- (4) Assistant Lecturer
- (5) Chief Research Officer
- (6) Research Officer
- (7) Assistant Research Officer
- (8) Other (Specify)_____

III. Professional Qualification (highest Completed)

- (1) Ph.D. in Agriculture and/or other discipline
- (2) Master of Science
- (3) Bachelor of Science
- (4) Diploma in Agriculture
- (5) Certificate in Agriculture
- (6) Other (Specify) _____

IV. Years of Professional experience in your present job

- (1) 15 and over
- (2) 10 but less than 15 years
- (3) 5 but less than 10 years
- (4) Less than 5 years

V. Sex

- (1) Male
- (2) Female

VI. Nationality

- (1) Swazi
- (2) Other (Specify)_____

PART II

INSTRUCTIONS:

Please read each statement carefully and place a check mark () under the column that best reflects your opinion about cooperation between the University of Swaziland and the Malkerns Agricultural Research Station.

Strongly Agree = SA; Agree = A; Undecided = U
Disagree = D; Strongly Disagree = SD

8. POSSIBLE AREAS OF COOPERATION

a. IDENTIFICATION OF RESEARCH PROBLEMS

Example:

For the University of Swaziland and the Malkerns Agricultural Research Station to effectively IDENTIFY RESEARCH PROBLEM AREAS, there is a need to:

	SA	A	U	D	SD
establish each institutions' research interest	()	()	()	()	()

SA () means that I strongly agree with the statement.

For the University of Swaziland and the Malkerns Agricultural Research Station to effectively IDENTIFY RESEARCH PROBLEM AREAS, there is a need to jointly:

	SA	A	U	D	SD
1. establish research priorities	()	()	()	()	()
2. distinguish between basic and applied research in order to ensure that there is a balance	()	()	()	()	()
3. establish a joint research committee for identification of research problems	()	()	()	()	()
4. stipulate completion time for each research project as a basis for identification of future research projects	()	()	()	()	()
5. determine costs of undertaking identified research projects	()	()	()	()	()
6. consider research projects by using					
(a) problem approach	()	()	()	()	()
(b) discipline approach	()	()	()	()	()
7. identify successfully completed research as basis for setting research priorities	()	()	()	()	()
8. determine relevant research projects conducted in other countries to be used as basis for identifying research problem areas	()	()	()	()	()
9. schedule regular meetings for considering proposed research projects	()	()	()	()	()
10. other (Specify)_____	()	()	()	()	()

Comments: _____

b. SECURING OF FUNDS

For the University of Swaziland and the Malkerns Agricultural Research Station to be able to SECURE FUNDS for research projects, there is a need for the two institutions to jointly:

SA A U D SD

- | | |
|---|---------------------|
| 1. establish a research fund | () () () () () |
| 2. allocate funds on the basis of research priorities | () () () () () |
| 3. appoint a committee for soliciting funds from: | |
| (a) private industries | () () () () () |
| (b) international finance institutions | () () () () () |
| 4. define procedures for applying for research funds | () () () () () |
| 5. present regular reports on research spending | () () () () () |
| 6. ensure that research projects are in the interest of national development | () () () () () |
| 7. establish links with international financing institutions | () () () () () |
| 8. determine local government funding as basis for determining the need for extra funding | () () () () () |
| 9. establish links with similar foreign institutions (faculties of agriculture and Research institutions) in order to import desirable funding procedures | () () () () () |
| 10. other (Specify) _____ | () () () () () |

Comments: _____

c. ADVANCEMENT OF ACADEMIC STAFF

The University of Swaziland and the Malkerns Agricultural Research Station may expedite the ADVANCEMENT OF ACADEMIC STAFF by:

SA A U D SD

- | | |
|--|---------------------|
| 1. joint training of potential staff | () () () () () |
| 2. joint selection of criteria for staff development | () () () () () |
| 3. joint authorship (i.e. research papers) | () () () () () |
| 4. joint presentation of research results | () () () () () |
| 5. assigning beginning professionals with more experienced individuals | () () () () () |
| 6. encouraging beginning professionals to read journals and other research reports | () () () () () |
| 7. encouraging professionals to publish locally and in international journals | () () () () () |
| 8. joint staff performance evaluation | () () () () () |
| 9. establishing standard procedures for conducting research studies | () () () () () |
| 10. chairing research reporting meetings on rotational basis | () () () () () |
| 11. identifying individual professional interests in research | () () () () () |
| 12. providing opportunities to staff members to visit other teaching and research institutions outside Swaziland | () () () () () |
| 13. scheduling joint workshops for reporting research results | () () () () () |
| 14. joint staff development programmes | () () () () () |
| 15. encouragement of team projects as opposed to individual undertakings | () () () () () |
| 16. rewarding staff for distinguished | |
| (a) teaching service | () () () () () |
| (b) research service | () () () () () |
| 17. other (Specify) _____ | () () () () () |

Comments: _____

D. TRAINING OF STUDENTS IN VARIOUS AGRICULTURAL DISCIPLINES

The University of Swaziland and the Malkerns Agricultural Research Station may enhance the TRAINING OF THE STUDENTS IN VARIOUS AGRICULTURAL DISCIPLINES by jointly:

SA A U D SD

- | | |
|--|---------------------|
| 1. teaching some courses | () () () () () |
| 2. tutoring degree students | () () () () () |
| 3. helping students identify dissertation topics | () () () () () |

	SA	A	U	D	SD
4. supervising students' dissertation projects	()	()	()	()	()
5. using degree students to collect data during field extension training	()	()	()	()	()
6. supervising students during field extension training	()	()	()	()	()
7. conducting agricultural demonstrations	()	()	()	()	()
8. (a) reviewing curriculum	()	()	()	()	()
(b) designing curriculum	()	()	()	()	()
(c) developing curriculum	()	()	()	()	()
9. holding agricultural seminars	()	()	()	()	()
10. writing short research papers	()	()	()	()	()
11. developing professionals in agriculture	()	()	()	()	()
12. attending oral examination (thesis defense by degree students)	()	()	()	()	()
13. setting final examinations	()	()	()	()	()
14. identifying potential teaching & research staff	()	()	()	()	()
15. screening candidates applying to enroll in agriculture	()	()	()	()	()
16. advising degree students	()	()	()	()	()
17. reviewing students' academic records	()	()	()	()	()
18. other (Specify)_____	()	()	()	()	()

Comments: _____

e. SHARING OF INFRASTRUCTURE AND PHYSICAL FACILITIES

The University of Swaziland and the Malkerns Agricultural Research Station may improve their effectiveness by sharing each of the following INDIVIDUAL INSTITUTIONS' INFRASTRUCTURE AND PHYSICAL RESOURCES:

	SA	A	U	D	SD
1. laboratories					
(a) equipment	()	()	()	()	()
(b) miscellaneous laboratory facilities	()	()	()	()	()
2. library					
(a) documentation equipment	()	()	()	()	()
(b) storing facilities	()	()	()	()	()

	SA	A	U	D	SD
3. transportation					
(a) trucks	()	()	()	()	()
(b) vans	()	()	()	()	()
(c) buses	()	()	()	()	()
4. land					
(a) farm plots	()	()	()	()	()
(b) experimental plots	()	()	()	()	()
(c) museum plots	()	()	()	()	()
(d) grazing land	()	()	()	()	()
5. farm machinery and equipment	()	()	()	()	()
6. buildings					
(a) staff houses	()	()	()	()	()
(b) offices	()	()	()	()	()
(c) lecture halls	()	()	()	()	()
7. livestock for					
(a) experimental purposes	()	()	()	()	()
(b) demonstration purposes	()	()	()	()	()
8. data analysis facilities	()	()	()	()	()
9. soil analysis equipment	()	()	()	()	()
10. labourers					
(a) secretarial services	()	()	()	()	()
(b) unskilled services	()	()	()	()	()
11. visual and audio visual equipment	()	()	()	()	()
12. irrigation equipment	()	()	()	()	()
13. miscellaneous					
(a) researching software	()	()	()	()	()
(b) teaching software	()	()	()	()	()
14. professional staff personnel	()	()	()	()	()
15. recreational facilities	()	()	()	()	()
16. other (specify)_____	()	()	()	()	()

Comments: _____

PART III

C. POSSIBLE IMPEDING FACTORS

Several factors may impede attempts by the University of Swaziland and the Malkerns Agricultural Research Station to effectively work together in order to maximize the use of limited human and material resources. These factors need to be identified and resolved. Please place a check mark () to indicate to what extent you would agree or disagree that the following items may impede cooperation:

SA A U D SD

1. physical distance between the institutions() () () () ()
2. differences in institutional policies () () () () ()
3. staff turn-over () () () () ()
4. lack of frequent joint meetings () () () () ()
5. lack of sharing
 (a) short term teaching & research objectives () () () () ()
 (b) long term teaching & research objectives () () () () ()
6. fear of loss of autonomy () () () () ()
7. differences in staff allegiance () () () () ()
8. political considerations (e.g. unnecessary government interference) () () () () ()
9. institutional territories (turf) () () () () ()
10. lack of a joint united front for pushing team efforts (e.g. government policy) () () () () ()
11. difficulty in identifying research problem areas in the interest of both institutions() () () () ()
12. international influences in terms of funding () () () () ()
13. parallels between teaching and research () () () () ()
14. conflicting interest groups () () () () ()
15. differences in terms of
 (a) employment conditions () () () () ()
 (b) benefits conditions () () () () ()
16. difficulty in joint appointment () () () () ()
17. professional
 (a) biases () () () () ()
 (b) stereotypes () () () () ()
18. Other (specify)_____ () () () () ()

Comments: _____

PART IV

- D. GENERAL COMMENTS AND/OR SUGGESTIONS FOR THE DESIGN OF SOME EFFORTS WHICH MIGHT STRENGTHEN THE TWO INSTITUTIONS WORKING RELATIONSHIP.

INSTRUCTIONS:

Please write your comments and/or suggestions about additional ways to build cooperation between the two institutions.

Appendix F

COMMENTS BY UNIVERSITY TEACHING STAFF

1. A workshop should be initiated and involve the Faculty of Agriculture, Malkerns Research Station and donor agencies to discuss some of the bottlenecks and to sensitize all incumbent staffs to the necessity of inter-agency coordination.
2. There is a need to orient funding agencies about institutional policies, otherwise international funding agencies might promote irrelevant research.
3. There is a need to re-consider positive achievements which were made during the time when the time institutions had established a linkage and disregard the negative encounters.
4. Cooperation between the University and the Malkerns Research Division might help university students to have an opportunity to relate theory to real life situations.
5. Collaboration between the University and Malkerns Research might be helpful in curriculum revision.
6. There is a need to carefully plan for any proposed inter-agency coordination process in order to align the overall goal of the University and Malkerns Research Station.
7. There is a need to dove-tail promotion criteria for the University and the Research Division.
8. There is a need to initiate animal science research

units that will involve both the University and the Research Division as a mechanism of inter-agency coordination.

9. There is a need for the Government of Swaziland to build up these institutions from local funding with minimum reliance from international development agencies which might promote individual efforts.
10. There is a need to start building up the inter-agency coordination process at the institution level in order to reinforce efforts by the government.
11. There is a need for each institution to take an inventory of available resources, ensure that there is internal cooperation and then work toward an inter-agency coordination process.
12. There is a need to redefine the University and the Research Division policies.
13. There is a need for University and Malkerns Research Station to be actively involved in both the training of agricultural technicians and Research work.
14. There is a need to use the sharing of physical infrastructure and physical facilities as a starting point for any proposed inter-agency coordination.
15. There is a need to re-define the relatedness in teaching and research as an effort to rationalize cooperation.
16. There is a need to work out a forumular for recognizing outstanding individuals and/or joint ventures as a

means to encourage team efforts.

17. There is a need to encourage the involvement of private industries that might promote a joint venture in research and in training agricultural technicians.
18. There is a need to encourage each institution to send a representative to attend essential planning meetings each institution may be occassionally holding.
19. There is a need to realize that the will of incumbent staffs in both institutions to work together and develop a joint venture that will be in the interest of those institutions, can make this inter-agency coordination workable.
20. There is a need to set a joint University Faculty of Agriculture and Malkerns Agricultural Research Station committee to deliberate with government on the inter-agency coordination process.
21. There is a need for incumbent staffs in both institutions to recognize that this inter-agency coordination process might allow University Teaching Staff to actively participate in research and research personnel would also have an opportunity to be kept abreast of academic issues.
22. There is a need to carefully decide on the planning and monitoring of funds prior to engaging into an inter-agency coordination venture.

Appendix G

COMMENTS BY MALKERNS AGRICULTURAL RESEARCH STAFF

1. More emphasis should be placed on soliciting private institutions that might benefit from research findings to finance research studies.
2. There is a need to have a coordinating person for the two institutions.
3. There is a need to encourage students to write their dissertations using current information from on going research projects.
4. Emphasis should be placed also on person to person contact for joint research work as it may not be always possible to have more people involved.
5. There is a need to carefully decide as to what facilities might be shared by the two institutions, because there are no uglier fights than to fight over such items as money, cars and research/teaching facilities.
6. There is a need to critically evaluate resource requirement for either teaching and/or research at these institutions.
7. There is a need to build up a manpower/capital base in order to strengthen the proposed linkages between the faculty of agriculture and the research station.
8. There is a need to consider the overall administrative management of these institutions by the Ministry of Education and the Ministry of Agriculture and

Cooperatives under which each of these institution falls.

9. There is a need for supporting a cooperative effort in the training of agricultural technicians.
10. There is a need to provide opportunities to both teaching and research staffs to visit similar institutions in other developing countries in order to observe how they manage their limited resources in the institutions.
11. There is a need for considereing a joint relationship in order to help among many other things identify replacement staff.
12. There is a need to establish collaboration between these institutions in order to work on cooperate research trial initiation, management and analysis.

Appendix H

Footnote:

(1) Read Tables (Set 1-4) with reference to the questionnaire on appendix E.

(2) Use the key of: $\bar{X} = 1.00 - 2.50 = \text{Agreement}$, $\bar{X} = 2.51 - 3.50 = \text{Indecision}$ and $\bar{X} = 3.51 - 5.00 = \text{Disagreement}$ for interpretation.

SET 1

TABLE 1a) Perceptions of Joint Identification of Research Problems as a Possible Area of Collaboration between the University of Swaziland-Faculty of Agriculture (UNISWA) and the Malkerns Agricultural Research Station (MARS) Held by the University Teaching Staff and the Malkerns Research Personnel in Swaziland (N=47).

	P N = 2		SL N = 2		L N = 22		AL N = 3		C R C N = 1		RO N = 3		ARO N = 2		OTHER N = 12		OVERALL N = 47	
	$\bar{X}$	SD	$\bar{X}$	SD	$\bar{X}$	SD	$\bar{X}$	SD	$\bar{X}$	SD	$\bar{X}$	SD	$\bar{X}$	SD	$\bar{X}$	SD	$\bar{X}$	SD
1	1.00	--	1.50	0.70	1.45	0.96	1.3	0.57	1.00	--	1.33	0.57	2.00	--	1.58	0.51	1.45	0.74
2	1.50	0.70	2.00	1.41	1.90	0.75	1.33	0.57	2.00	--	1.67	0.57	1.50	0.70	2.25	1.05	1.91	0.83
3	1.00	--	1.50	0.70	1.50	0.91	1.00	--	2.00	--	1.00	--	2.50	0.70	2.41	1.44	1.70	1.08
4	1.50	0.70	1.50	0.70	2.00	0.87	1.33	0.57	2.00	--	1.66	0.57	2.00	--	2.25	0.86	1.95	0.80
5	1.00	--	1.50	0.70	1.95	0.95	1.33	0.57	2.00	--	2.00	1.00	2.00	--	2.58	1.37	2.02	1.05
6 a	1.00	--	1.00	--	1.77	0.86	1.33	0.57	3.00	--	2.00	1.00	2.50	0.70	2.00	1.20	1.80	0.94
b	2.50	0.70	3.50	2.12	2.36	0.79	2.00	1.00	3.00	--	3.00	1.00	2.50	0.70	3.08	1.24	2.63	1.00
7	2.50	2.12	1.00	--	1.72	0.82	1.66	1.15	2.00	--	2.00	--	2.00	1.41	2.91	1.37	2.06	1.31
8	3.00	1.41	2.00	1.41	2.31	0.99	1.66	0.57	1.00	--	1.33	0.57	3.00	1.41	2.08	0.90	2.17	0.99
9	1.00	--	1.00	--	1.50	0.80	1.00	--	1.00	--	2.33	0.57	1.50	0.70	2.00	1.12	1.59	0.87

SET 1

TABLE 1b) Perceptions of Joint Securing of Funds as a Possible Area of Collaboration between the University of Swaziland-Faculty of Agriculture (UNISWA) and the Malkerns Agricultural Research Station (MARS) Held by the University Teaching Staff and the Malkerns Research Personnel in Swaziland (N=47).

	P N = 2		SL N = 2		L N = 22		AL N = 3		C R O N = 1		RO N = 3		ARO N = 2		OTHER N = 12		OVERALL N = 47	
	$\bar{X}$	S	$\bar{X}$	SD	$\bar{X}$	SD	$\bar{X}$	SD	$\bar{X}$	SD	$\bar{X}$	SD	$\bar{X}$	SD	$\bar{X}$	SD	$\bar{X}$	SD
1	3.00	--	1.50	0.70	1.72	1.12	1.33	0.57	2.00	--	1.33	0.57	2.50	0.70	2.16	1.11	1.87	1.03
2	1.50	0.70	1.50	0.70	1.45	0.67	1.00	--	2.00	--	1.66	1.15	2.50	0.70	1.91	1.16	1.61	0.84
3 a	2.00	--	1.00	--	1.77	1.11	1.00	--	3.00	--	1.66	0.57	2.50	0.70	2.25	1.05	1.87	1.03
b	2.00	1.41	1.00	--	1.86	1.32	1.00	--	2.00	--	2.00	--	1.50	0.70	1.83	0.83	1.76	1.04
4	1.50	0.70	1.00	--	1.85	1.08	1.00	--	3.00	--	2.00	--	2.00	1.41	2.15	1.19	1.87	1.03
5	1.50	0.70	1.50	0.70	1.50	0.85	1.00	--	2.00	--	1.33	0.57	2.00	--	1.41	0.51	1.46	0.68
6	1.00	--	1.00	--	1.31	0.64	1.00	--	1.00	--	1.33	0.57	1.00	--	1.25	0.45	1.23	0.52
7	1.00	--	1.00	--	1.45	0.67	2.00	1.00	1.00	--	1.00	--	2.00	--	1.66	0.77	1.48	0.68
8	1.50	0.70	1.50	0.70	1.72	0.76	1.66	1.15	1.00	--	1.33	0.57	2.00	--	2.16	0.93	1.78	0.80
9	1.00	--	1.00	--	1.72	0.70	2.00	1.00	2.00	--	1.66	0.57	2.00	--	2.25	1.05	1.83	0.81

SET 1

TABLE 1c) Perceptions of Advancement of Staff as a Possible Area of Collaboration between the University of Swaziland-Faculty of Agriculture (UNISWA) and the Malkerns Agricultural Research Station (MARS) Held by the University Teaching Staff and the Malkerns Research Personnel in Swaziland (N=47).

	P N = 2		SL N = 2		L N = 22		AL N = 3		C R O N = 1		RO N = 3		ARO N = 2		OTHER N = 12		OVERALL N = 47	
	$\bar{X}$	SD	$\bar{X}$	SD	$\bar{X}$	SD	$\bar{X}$	SD	$\bar{X}$	SD	$\bar{X}$	SD	$\bar{X}$	SD	$\bar{X}$	SD	$\bar{X}$	SD
1	1.50	0.70	2.00	--	2.18	1.05	1.33	0.57	3.00	--	1.00	--	1.00	--	1.50	0.79	1.80	0.94
2	1.50	0.70	3.00	--	2.22	1.15	1.33	0.57	3.00	--	1.66	0.57	2.00	--	2.41	0.90	2.19	0.99
3	1.00	--	1.00	--	2.04	0.78	1.66	1.15	2.00	--	1.33	0.57	1.50	0.70	2.00	1.12	1.85	0.88
4	1.00	--	1.50	0.70	1.81	0.79	2.00	1.00	2.00	--	1.66	0.57	2.00	--	1.83	0.93	1.78	0.77
5	1.50	0.70	1.50	0.70	1.54	0.51	2.33	1.52	1.00	--	1.66	0.57	2.00	--	1.75	0.96	1.66	0.73
6	1.00	--	1.00	--	1.31	0.47	1.33	0.57	1.00	--	1.33	0.57	2.00	--	1.50	0.67	1.36	0.52
7	1.00	--	1.00	--	1.50	0.74	2.00	1.73	1.00	--	1.66	0.57	1.50	0.70	1.50	0.67	1.48	0.74
8	3.00	1.41	2.50	0.70	2.45	1.18	1.33	0.57	3.00	--	2.33	0.57	2.50	0.70	2.00	0.85	2.29	1.02
9	1.00	--	2.00	1.41	2.31	1.17	1.33	0.57	2.00	--	1.33	0.57	2.00	--	2.50	0.90	2.14	1.04
10	1.50	0.70	1.50	0.70	2.04	0.84	2.33	1.52	2.00	--	2.00	1.00	2.50	0.70	2.08	0.79	2.04	0.83
11	1.00	--	1.00	--	1.72	0.70	1.66	0.57	2.00	--	2.66	1.15	2.50	0.70	1.91	0.90	1.80	0.79
12	1.00	--	1.00	--	1.63	0.65	1.00	--	1.00	--	1.33	0.57	1.50	0.70	1.58	0.90	1.48	0.68
13	1.00	--	1.00	--	1.40	0.59	1.00	--	1.00	--	1.00	--	2.00	--	1.83	0.71	1.44	0.61
14	1.50	0.70	1.50	0.70	2.13	0.77	1.00	--	3.00	--	1.66	0.57	2.50	0.70	2.50	1.00	2.10	0.86
15	1.00	--	1.50	0.70	2.27	1.03	1.00	--	2.00	--	1.33	0.57	2.00	--	2.16	1.33	2.00	1.06
16a	1.00	--	1.00	--	1.45	0.73	1.66	1.15	1.00	--	2.33	0.57	2.50	0.70	1.83	0.71	1.61	0.76
b	1.00	--	1.00	--	1.36	0.72	1.66	1.15	1.00	--	2.33	0.57	2.50	0.70	1.58	0.51	1.51	0.71

SET 1

TABLE 1d) Perceptions of Training of Students in Various Agricultural Disciplines as a Possible Area of Collaboration between the University of Swaziland-Faculty of Agriculture (UNISWA) and the Malkerns Agricultural Research Station (MARS) Held by the University Teaching Staff and the Malkerns Research Personnel in Swaziland (N=47).

	P N = 2		SL N = 2		L N = 22		AL N = 3		C R O N = 1		RO N = 3		ARO N = 2		OTHER N = 12		OVERALL N = 47	
	$\bar{X}$	SD	$\bar{X}$	SD	$\bar{X}$	SD	$\bar{X}$	SD	$\bar{X}$	SD	$\bar{X}$	SD	$\bar{X}$	SD	$\bar{X}$	SD	$\bar{X}$	SD
1	1.50	0.70	1.00	--	2.09	1.19	1.33	0.57	1.00	--	1.66	0.57	2.00	1.41	1.75	0.45	1.83	0.89
2	1.50	0.70	1.00	--	1.95	0.84	1.33	0.57	1.00	--	2.00	--	2.50	0.70	2.58	1.16	2.02	0.94
3	1.50	0.70	1.00	--	1.40	0.50	1.00	--	1.00	--	1.33	0.57	2.50	0.70	2.00	1.04	1.55	0.74
4	1.50	0.70	1.50	0.70	1.77	0.97	2.00	1.00	1.00	--	1.66	0.57	2.00	--	1.91	0.79	1.78	0.83
5	1.50	0.70	1.50	0.70	1.90	0.75	1.33	0.57	1.00	--	2.33	0.57	2.00	--	1.66	0.65	1.78	0.69
6	1.50	0.70	1.50	0.70	2.04	1.09	1.33	0.57	1.00	--	2.33	1.15	2.00	--	1.66	0.49	1.85	0.88
7	1.50	0.70	1.50	0.70	1.72	0.98	1.00	--	1.00	--	2.33	0.57	2.00	--	1.66	1.15	1.68	0.93
8a	2.00	--	2.00	1.41	2.40	1.26	1.66	0.57	2.00	--	2.66	0.57	2.00	--	1.75	0.75	2.14	1.02
b	2.00	--	2.00	1.41	2.59	1.26	1.66	0.57	2.00	--	2.66	0.57	2.00	--	1.83	0.71	2.25	1.03
c	2.00	--	2.00	1.41	2.40	1.29	1.33	0.57	2.00	--	2.66	0.57	2.00	--	1.83	0.83	2.14	1.06
9	1.50	0.70	1.00	--	1.40	0.50	1.33	0.57	2.00	--	1.33	0.57	1.00	--	1.50	0.52	1.40	0.49
10	1.50	0.70	1.00	--	1.59	0.66	1.33	0.57	1.00	--	1.33	0.57	2.00	--	1.50	0.52	1.51	0.58
11	1.50	0.70	1.50	0.70	1.77	0.75	1.00	--	1.00	--	2.00	--	2.00	--	1.75	0.86	1.70	0.72
12	1.50	0.70	1.00	--	1.90	1.15	1.00	--	4.00	--	2.66	0.57	2.00	--	2.16	1.11	1.95	1.08
13	1.50	0.70	2.00	1.41	3.27	1.24	1.66	1.15	4.00	--	3.33	0.57	2.50	0.70	2.83	1.11	2.91	1.21
14	2.00	--	2.00	1.41	2.27	1.03	1.33	0.57	2.00	--	2.33	0.57	2.50	0.70	2.16	0.83	2.17	0.89
15	3.00	1.41	4.00	--	3.13	1.28	2.00	1.00	3.00	--	1.66	0.57	2.00	--	2.75	1.21	2.85	1.21
16	1.50	0.70	2.00	1.41	2.18	0.73	2.00	1.00	3.00	--	2.33	0.57	2.00	--	2.33	0.88	2.19	0.77
17	2.00	--	3.00	1.41	3.27	1.20	3.66	0.57	4.00	--	3.00	1.00	2.00	--	2.66	1.30	3.02	1.17

SET 1

TABLE 1e) Perceptions of Sharing Infrastructure and Physical Facilities as a Possible Area of Collaboration between the University of Swaziland-Faculty of Agriculture (UNISWA) and the Malkerns Agricultural Research Station (MARS) Held by the University Teaching Staff and the Malkerns Research Personnel in Swaziland (N=47).

	P N = 2		SL N = 2		L N = 22		AL N = 3		C R O N = 1		RO N = 3		ARO N = 2		OTHER N = 12		OVERALL N = 47	
	$\bar{X}$	SD	$\bar{X}$	SD	$\bar{X}$	SD	$\bar{X}$	SD	$\bar{X}$	SD	$\bar{X}$	SD	$\bar{X}$	SD	$\bar{X}$	SD	$\bar{X}$	SD
1a	1.00	--	1.50	0.70	1.50	0.89	1.00	--	2.00	--	2.00	1.00	3.00	2.82	2.00	0.95	1.68	0.98
b	1.00	--	1.50	0.70	1.40	0.66	1.00	--	2.00	--	2.00	1.00	3.00	2.82	1.83	0.57	1.53	0.82
2a	1.00	--	1.00	--	1.31	0.56	1.00	--	2.00	--	1.66	1.15	3.00	2.82	1.91	0.51	1.53	0.84
b	2.50	2.12	1.00	--	1.95	1.06	1.00	--	2.00	--	2.00	1.00	3.00	2.82	2.16	0.71	1.97	1.05
3a	3.00	1.41	3.00	--	2.72	1.27	2.33	1.52	4.00	--	2.33	1.15	3.00	2.82	3.50	1.08	2.93	1.28
b	3.00	1.41	3.00	--	2.68	1.32	2.33	1.52	4.00	--	2.33	1.15	3.50	2.12	3.33	1.37	2.89	1.30
c	3.00	1.41	3.00	--	2.72	1.31	2.33	1.52	4.00	--	2.33	1.15	3.50	2.12	3.00	1.20	2.83	1.23
4a	1.50	0.70	1.50	0.70	2.50	1.14	1.00	--	4.00	--	2.00	1.00	3.50	2.12	2.25	0.96	2.29	1.14
b	1.50	0.70	1.50	0.70	2.27	1.07	1.00	--	2.00	--	2.00	1.00	3.50	2.12	2.33	0.77	2.17	1.02
c	1.50	0.70	2.00	1.41	2.27	0.88	1.00	--	2.00	--	2.00	1.00	3.50	2.12	2.58	0.79	2.25	0.96
d	3.00	1.41	2.50	2.12	2.68	1.08	1.33	0.57	5.00	--	2.33	0.57	3.50	2.12	2.50	1.31	2.61	1.22
5	2.00	--	2.50	0.70	2.13	1.03	1.00	--	4.00	--	2.00	1.00	3.50	2.12	2.25	0.86	2.19	1.03
6a	2.00	--	2.50	0.70	3.04	1.17	1.33	0.57	5.00	--	3.00	1.00	3.00	1.41	3.41	1.08	3.00	1.18
b	2.50	0.70	3.00	--	2.95	1.09	2.00	1.00	5.00	--	2.66	0.57	3.50	2.12	2.83	1.03	2.89	1.06
c	2.00	--	2.00	1.41	2.27	0.82	1.66	1.15	5.00	--	3.00	1.00	3.00	1.41	1.08	1.08	2.29	1.02
7a	2.00	--	2.00	1.41	2.27	0.97	1.00	--	2.00	--	2.00	--	3.50	2.12	2.25	1.13	2.17	1.04
b	2.00	--	2.00	1.41	2.00	0.92	1.00	--	2.00	--	2.00	1.00	3.50	2.12	2.08	1.37	2.02	1.09
8	1.00	--	1.00	--	1.40	0.59	1.00	--	2.00	--	1.66	1.15	3.50	2.12	1.50	0.67	1.48	0.80
9	1.00	--	1.00	--	1.63	0.90	1.00	--	2.00	--	1.66	1.15	3.50	2.12	1.66	0.77	1.63	0.94
10a	3.00	1.41	2.00	--	3.22	0.92	1.66	1.15	5.00	--	2.66	1.52	4.50	0.70	3.58	1.24	3.21	1.17
b	3.00	1.41	2.50	0.70	3.18	0.90	1.66	1.15	5.00	--	3.00	1.00	3.50	2.12	3.50	1.38	3.17	1.16
11	1.50	0.70	1.50	0.70	1.95	0.89	1.00	--	2.00	--	2.00	1.00	3.50	2.12	2.00	0.60	1.93	0.89
12	2.00	--	3.00	2.82	2.45	1.26	1.00	--	4.00	--	1.66	1.15	3.50	2.12	2.50	1.08	2.40	1.28
13a	1.50	0.70	1.00	--	1.86	0.83	1.00	--	5.00	--	2.33	1.15	3.50	2.12	2.66	0.98	2.12	1.11
b	1.50	0.70	1.00	--	1.90	0.81	1.00	--	5.00	--	2.33	0.57	3.50	2.12	2.41	0.99	2.08	1.06
14	1.00	--	1.50	0.70	1.86	0.88	1.00	--	2.00	--	1.66	1.15	3.50	2.12	2.00	0.60	1.85	0.90
15	1.50	0.70	1.00	--	2.13	0.94	1.00	--	2.00	--	1.66	1.15	3.50	2.12	1.91	1.08	1.95	1.04

SET 1

TABLE 2) Perceptions of Impeding Factors to Collaboration between the University of Swaziland-Faculty of Agriculture (UNISWA) and the Malkerns Agricultural Research Station (MARS) Held by the University Teaching Staff and the Malkerns Research Personnel in Swaziland (N=47).

	P N = 2		SL N = 2		L N = 22		AL N = 3		C R O N = 1		RO N = 3		ARO N = 2		OTHER N = 12		OVERALL N = 47	
	$\bar{X}$	SD	$\bar{X}$	SD	$\bar{X}$	SD	$\bar{X}$	SD	$\bar{X}$	SD	$\bar{X}$	SD	$\bar{X}$	SD	$\bar{X}$	SD	$\bar{X}$	SD
1	3.50	2.12	4.00	--	3.50	1.43	4.66	0.57	5.00	--	2.66	0.57	3.50	0.70	3.08	1.31	3.46	1.31
2	1.50	0.70	1.00	--	2.31	1.28	2.00	1.00	2.00	--	1.66	1.15	3.00	--	2.50	1.24	2.23	1.18
3	1.50	0.70	2.50	0.70	2.22	1.02	2.33	1.52	3.00	--	2.66	0.57	2.50	0.70	2.58	1.16	2.36	1.00
4	1.00	--	2.00	1.41	2.50	1.22	2.33	1.52	1.00	--	1.66	0.51	2.50	0.70	2.16	1.11	2.23	1.14
5a	1.00	--	2.00	1.41	2.50	1.22	2.33	1.52	1.00	--	2.00	--	2.50	0.70	2.08	1.24	2.23	1.16
b	1.00	--	2.00	1.41	2.36	1.17	1.66	0.57	1.00	--	2.33	0.57	2.50	0.70	2.00	1.12	2.12	1.07
6	3.00	1.41	1.50	0.70	2.54	1.10	1.66	0.57	5.00	--	2.66	1.52	3.00	1.41	2.25	1.35	2.46	1.21
7	1.50	0.70	2.00	1.41	2.68	1.12	1.33	0.57	1.00	--	2.00	1.00	2.50	0.70	2.41	1.44	2.36	1.18
8	1.50	0.70	2.00	1.41	2.40	1.41	2.66	0.57	2.00	--	2.00	1.00	3.50	0.70	2.25	1.28	2.34	1.10
9	2.00	--	2.00	1.41	2.90	1.06	2.33	0.57	3.00	--	2.66	0.57	4.00	--	2.25	1.13	2.66	1.04
10	2.00	--	1.50	0.70	2.40	1.00	2.66	1.15	3.00	--	2.00	--	2.50	0.70	2.25	1.13	2.31	0.95
11	3.00	1.41	3.00	--	3.09	1.19	3.33	1.15	3.00	--	2.66	1.15	2.50	0.70	2.25	1.42	2.83	1.20
12	2.50	2.12	3.00	--	2.95	1.04	4.00	--	2.00	--	2.33	0.57	3.50	0.70	2.16	1.33	2.76	1.14
13	3.00	1.41	3.00	1.41	2.77	1.02	2.66	1.15	3.00	--	2.00	--	3.00	1.41	2.58	1.44	2.70	1.10
14	3.00	1.41	2.00	1.41	2.45	1.10	2.66	1.15	4.00	--	2.33	0.57	3.50	0.70	2.33	1.37	2.51	1.14
15a	2.50	2.12	2.50	2.12	2.27	1.12	2.00	1.00	1.00	--	1.66	0.57	2.00	--	1.83	1.33	2.08	1.15
b	1.50	0.70	2.50	2.12	2.50	1.22	2.00	1.00	1.00	--	1.66	0.57	2.00	--	1.83	1.33	2.14	1.19
16	1.00	--	2.00	1.41	2.50	1.01	2.00	--	1.00	--	2.33	0.57	2.00	--	2.00	1.20	2.19	1.01
17a	3.00	1.41	1.50	0.70	2.50	0.80	2.00	--	2.00	--	2.00	--	2.00	--	2.08	1.44	2.27	0.97
b	3.00	1.41	1.50	0.70	2.54	0.80	1.66	0.57	2.00	--	2.33	0.57	2.00	--	2.25	1.42	2.34	0.98

SET 2

TABLE 1a) Perceptions of Joint Identification of Research Problems as a Possible Area of Collaboration between the University of Swaziland-Faculty of Agriculture (UNISWA) and the Malkerns Agricultural Research Station (MARS) Held by the University Teaching Staff and the Malkerns Research Personnel in Swaziland (N=47).

	Ph.D N = 6		MS N = 23		BS N = 9		DIPLOMA N = 1		CERTIFICATE N = 4		OTHER N = 4		OVERALL N = 47	
	$\bar{X}$	SD	$\bar{X}$	SD	$\bar{X}$	SD	$\bar{X}$	SD	$\bar{X}$	SD	$\bar{X}$	SD	$\bar{X}$	SD
1	1.83	1.16	1.26	0.54	1.33	0.50	1.00	--	1.50	0.57	2.50	1.00	1.46	0.74
2	1.83	0.75	2.04	0.87	1.44	0.52	2.00	--	1.75	0.50	2.50	1.29	1.91	0.83
3	1.83	1.32	1.52	0.94	1.77	1.30	1.00	--	1.75	0.95	2.50	1.29	1.70	1.08
4	2.00	1.09	1.87	0.69	1.77	0.83	2.00	--	2.00	0.18	2.75	0.95	1.95	0.80
5	1.83	1.16	2.00	0.90	1.66	0.70	2.00	--	2.00	0.81	3.25	2.06	2.02	1.05
6 a	1.16	0.40	1.69	0.76	1.88	1.05	3.00	--	2.75	1.25	2.00	1.41	1.80	0.94
b	3.33	1.36	2.39	0.83	2.44	0.88	2.00	--	3.25	1.25	3.00	1.15	2.63	1.00
7	2.33	1.21	1.82	1.07	2.22	1.20	1.00	--	2.25	0.95	2.75	1.50	2.06	1.13
8	2.66	1.03	2.17	0.88	1.88	0.60	1.00	--	1.75	0.50	2.75	2.06	2.17	0.98
9	1.83	1.32	1.52	0.79	1.55	0.72	4.00	--	1.25	0.50	1.50	0.57	1.59	0.89

SET 2

TABLE 1b) Perceptions of Joint Securing of Funds as a Possible Area of Collaboration between the University of Swaziland-Faculty of Agriculture (UNISWA) and the Malkerns Agricultural Research Station (MARS) Held by the University Teaching Staff and the Malkerns Research Personnel in Swaziland (N=47).

	Ph.D N = 6		MS N = 23		BS N = 9		DIPLOMA N = 1		CERTIFICATE N = 4		OTHER N = 4		OVERALL N = 47	
	$\bar{X}$	SD	$\bar{X}$	SD	$\bar{X}$	SD	$\bar{X}$	SD	$\bar{X}$	SD	$\bar{X}$	SD	$\bar{X}$	SD
1	2.66	1.03	1.87	1.05	1.66	1.00	2.00	--	1.50	0.57	1.50	1.29	1.87	1.03
2	1.66	0.51	1.69	0.92	1.33	0.70	1.00	--	1.50	0.57	2.00	1.41	1.61	0.84
3 a	2.00	0.63	1.82	1.07	2.00	1.22	2.00	--	1.75	0.95	1.75	1.25	1.87	1.01
b	2.50	1.51	1.69	1.06	1.44	0.52	3.00	--	1.50	0.57	1.75	1.25	1.76	1.04
4	1.83	0.75	1.91	0.99	1.44	0.52	1.00	--	2.75	0.95	2.00	2.16	1.87	1.03
5	1.83	0.75	1.56	0.72	1.33	0.50	1.00	--	1.25	0.50	1.00	0.81	1.46	0.68
6	1.50	0.54	1.34	0.57	1.00	--	1.00	--	1.25	0.50	0.75	0.50	1.23	0.52
7	1.83	0.98	1.47	0.51	1.33	0.70	1.00	--	1.50	0.57	1.50	1.29	1.48	0.68
8	2.00	0.63	1.87	0.86	1.55	0.72	1.00	--	1.75	0.50	1.75	1.25	1.78	0.80
9	1.66	0.81	1.91	0.79	1.88	0.60	1.00	--	1.50	0.57	2.00	1.63	1.83	0.81

SET 2

TABLE 1c) Perceptions of Advancement of Staff as a Possible Area of Collaboration between the University of Swaziland-Faculty of Agriculture (UNISWA) and the Malkerns Agricultural Research Station (MARS) Held by the University Teaching Staff and the Malkerns Research Personnel in Swaziland (N=47).

	Ph.D N = 6		MS N = 23		BS N = 9		DIPLOMA N = 1		CERTIFICATE N = 4		OTHER N = 4		OVERALL N = 47	
	$\bar{X}$	SD	$\bar{X}$	SD	$\bar{X}$	SD	$\bar{X}$	SD	$\bar{X}$	SD	$\bar{X}$	SD	$\bar{X}$	SD
1	2.16	1.16	2.08	0.99	1.33	0.50	1.00	--	1.00	0.00	1.75	0.95	1.80	0.94
2	2.50	1.51	2.30	0.82	1.44	0.52	1.00	--	2.00	0.00	3.25	1.25	2.19	0.99
3	1.66	0.81	2.08	0.84	1.33	0.70	1.00	--	2.00	1.41	2.00	0.81	1.85	0.88
4	1.66	0.81	1.95	0.87	1.77	0.66	1.00	--	1.25	0.50	1.75	0.50	1.78	0.77
5	1.50	0.54	1.52	1.77	0.97	1.00	1.00	--	1.75	0.50	2.50	1.29	1.66	0.73
6	1.16	0.40	1.30	0.47	1.22	0.44	1.00	--	1.75	0.50	2.00	0.81	1.36	0.52
7	1.33	0.51	1.43	0.72	1.55	1.01	1.00	--	1.50	0.57	2.00	0.81	1.48	0.74
8	2.83	0.98	2.47	1.03	1.55	0.72	1.00	--	1.75	0.50	3.00	0.81	2.29	1.02
9	2.33	1.75	2.21	0.90	1.55	0.52	3.00	--	1.75	0.50	3.00	1.41	2.14	1.04
10	2.16	1.16	2.00	0.73	2.22	0.97	1.00	--	1.75	0.95	2.25	0.50	2.04	0.83
11	1.33	0.51	1.78	0.85	2.00	0.86	1.00	--	2.00	0.81	2.25	0.50	1.80	0.79
12	1.16	0.40	1.65	0.77	1.44	0.52	1.00	--	1.00	--	1.75	0.95	1.48	0.68
13	1.50	0.83	1.39	0.49	1.11	0.33	1.00	--	1.50	0.57	2.50	0.57	1.44	0.61
14	2.33	1.03	2.17	0.77	1.55	1.01	1.00	--	2.50	0.57	2.50	0.57	2.10	0.86
15	1.50	0.83	2.21	0.90	1.11	0.33	1.00	--	2.00	0.81	3.75	1.25	2.00	1.06
16a	1.16	0.40	1.47	0.73	1.77	0.97	1.00	--	2.50	0.57	2.00	--	1.61	0.76
b	1.16	0.40	1.39	0.72	1.66	0.86	1.00	--	2.00	0.81	2.00	--	1.51	0.71

SET 2

TABLE 1d) Perceptions of Training of Students in Various Agricultural Disciplines as a Possible Area of Collaboration between the University of Swaziland-Faculty of Agriculture (UNISWA) and the Malkerns Agricultural Research Station (MARS) Held by the University Teaching Staff and the Malkerns Research Personnel in Swaziland (N=47).

	Ph.D N = 6		MS N = 23		BS N = 9		DIPLOMA N = 1		CERTIFICATE N = 4		OTHER N = 4		OVERALL N = 47	
	$\bar{X}$	SD	$\bar{X}$	SD	$\bar{X}$	SD	$\bar{X}$	SD	$\bar{X}$	SD	$\bar{X}$	SD	$\bar{X}$	SD
1	2.00	1.09	1.73	0.81	1.55	0.52	1.00	----	2.25	0.50	2.50	1.73	1.83	0.89
2	2.00	1.09	1.82	0.77	1.66	0.50	1.00	----	2.75	0.50	3.50	1.29	2.02	0.94
3	1.66	0.51	1.34	0.48	1.11	0.33	1.00	----	2.25	0.50	3.00	1.15	1.55	0.74
4	2.16	1.16	1.65	0.77	1.55	0.72	1.00	----	1.75	0.50	2.75	0.50	1.78	0.83
5	1.66	0.81	1.91	0.66	1.33	0.50	1.00	----	2.00	0.81	2.25	0.50	1.78	0.69
6	1.83	1.16	1.95	0.92	1.44	0.72	1.00	----	2.25	0.50	2.00	0.81	1.85	0.88
7	2.00	1.54	1.82	0.93	1.44	0.72	1.00	----	1.50	0.57	1.25	0.50	1.68	0.93
8a	2.33	1.50	2.34	1.02	1.88	0.78	1.00	----	2.00	0.81	1.75	0.95	2.14	1.02
b	2.33	1.50	2.52	1.03	1.88	0.78	1.00	----	2.25	0.50	1.75	0.95	2.25	1.03
c	2.33	1.50	2.39	1.07	1.77	0.83	1.00	----	2.00	0.81	1.75	0.95	2.14	1.06
9	1.50	0.54	1.47	0.51	1.33	0.50	1.00	----	1.50	0.57	1.00	----	1.40	0.49
10	1.66	0.81	1.52	0.59	1.44	0.52	1.00	----	1.75	0.50	1.25	0.50	1.51	0.58
11	1.83	0.98	1.82	0.77	1.33	0.50	1.00	----	1.75	0.50	1.75	0.50	1.70	0.72
12	2.00	1.26	1.95	1.18	1.77	1.09	1.00	----	2.25	0.95	2.25	0.50	1.95	1.08
13	2.33	1.50	3.21	1.66	2.77	1.20	2.00	----	3.00	----	2.50	1.73	2.91	1.21
14	2.16	0.75	2.21	0.99	1.88	0.78	1.00	----	2.50	1.00	2.50	0.57	2.17	0.89
15	3.16	1.03	3.08	1.20	2.00	0.85	2.00	----	2.25	1.25	3.00	1.41	2.85	1.21
16	2.33	1.21	2.21	0.73	1.77	0.66	3.00	----	2.75	0.50	2.00	----	2.19	0.77
17	3.00	1.09	3.26	1.17	3.00	0.86	4.00	----	2.25	0.50	2.25	2.06	3.02	1.17

SET 2

TABLE 1e) Perceptions of Sharing Infrastructure and Physical Facilities as a Possible Area of Collaboration between the University of Swaziland-Faculty of Agriculture (UNISWA) and the Malkerns Agricultural Research Station (MARS) Held by the University Teaching Staff and the Malkerns Research Personnel in Swaziland (N=47).

	Ph.D N = 6		MS N = 23		BS N = 9		DIPLOMA N = 1		CERTIFICATE N = 4		OTHER N = 4		OVERALL N = 47	
	$\bar{X}$	SD	$\bar{X}$	SD	$\bar{X}$	SD	$\bar{X}$	SD	$\bar{X}$	SD	$\bar{X}$	SD	$\bar{X}$	SD
1a	1.50	0.83	1.65	0.88	2.00	1.00	1.00	----	2.00	2.00	1.25	0.50	1.68	0.98
b	1.66	0.81	1.47	0.66	1.77	0.66	1.00	----	2.25	1.89	1.25	0.50	1.59	0.82
2a	1.33	0.51	1.43	0.66	1.66	0.70	1.00	----	2.50	1.73	1.25	0.50	1.53	0.80
b	2.50	1.37	1.91	0.94	1.88	0.78	3.00	----	2.50	1.73	1.00	----	1.97	1.05
3a	3.33	0.81	2.87	1.32	2.88	1.16	3.00	----	3.25	1.70	2.50	1.73	2.93	1.25
b	3.33	0.81	2.82	1.32	2.88	1.16	3.00	----	3.50	1.91	2.00	1.41	2.89	1.30
c	3.33	0.81	2.87	1.35	2.22	0.97	3.00	----	3.00	1.82	3.00	1.15	2.83	1.23
4a	2.50	1.37	2.52	1.12	1.66	0.70	3.00	----	2.50	1.91	1.75	0.50	2.29	1.14
b	2.16	1.16	2.26	1.05	1.77	0.83	3.00	----	2.50	1.73	2.00	----	2.17	1.02
c	1.83	0.75	2.43	0.89	1.77	0.83	2.00	----	3.25	1.70	2.00	----	2.25	0.96
d	3.00	1.26	2.91	1.16	1.77	0.66	2.00	----	3.25	2.06	1.75	0.50	2.61	1.22
5	2.50	1.04	2.21	0.99	1.88	0.78	2.00	----	2.25	1.89	2.25	1.25	2.19	1.03
6a	3.50	1.37	2.95	1.10	2.44	1.13	3.00	----	3.75	0.50	3.00	1.82	3.00	1.18
b	3.66	1.21	2.91	0.99	2.44	0.88	3.00	----	3.00	1.63	2.50	1.00	2.89	1.06
c	2.33	1.03	2.43	0.99	2.11	1.05	2.00	----	2.25	1.25	2.00	1.41	2.29	1.02
7a	2.66	1.21	2.13	0.81	1.77	1.09	1.00	----	3.50	1.29	1.50	0.57	2.17	1.04
b	2.33	1.03	2.08	0.94	1.55	0.72	1.00	----	3.00	2.30	1.50	0.57	2.02	1.09
8	1.50	0.80	1.52	0.59	1.33	0.70	1.00	----	2.00	2.00	1.25	0.50	1.48	0.80
9	1.66	1.03	1.69	0.82	1.55	0.88	1.00	----	2.00	2.00	1.25	0.50	1.63	0.94
10a	3.50	1.22	3.26	1.01	2.66	1.32	3.00	----	2.75	1.70	4.25	0.95	3.21	1.17
b	3.50	1.22	3.26	0.96	2.66	1.32	3.00	----	2.75	1.70	3.75	1.50	3.17	1.16
11	1.83	0.75	2.00	0.85	1.55	0.72	1.00	----	2.50	1.73	2.25	0.50	1.93	0.89
12	2.83	1.47	2.60	1.27	1.44	0.72	1.00	----	3.25	1.70	2.25	0.56	2.40	1.28
13a	2.00	0.89	2.00	1.08	1.77	1.20	3.00	----	3.56	1.29	2.25	0.50	2.12	1.11
b	1.83	0.75	2.08	1.08	1.88	1.16	3.00	----	2.50	1.73	2.25	0.50	2.08	1.06
14	1.83	1.32	1.87	0.69	1.77	0.83	1.00	----	2.50	1.73	1.50	0.57	1.85	0.90
15	2.33	1.50	2.04	0.70	1.55	1.01	2.00	----	2.25	2.21	1.50	0.57	1.95	1.04

SET 2

TABLE 2) Perceptions of Impeding Factors to Collaboration between the University of Swaziland-Faculty of Agriculture (UNISWA) and the Malkerns Agricultural Research Station (MARS) Held by the University Teaching Staff and the Malkerns Research Personnel in Swaziland (N=47).

	Ph.D N = 6		MS N = 23		BS N = 9		DIPLOMA N = 1		CERTIFICATE N = 4		OTHER N = 4		OVERALL N = 47	
	$\bar{X}$	SD	$\bar{X}$	SD	$\bar{X}$	SD	$\bar{X}$	SD	$\bar{X}$	SD	$\bar{X}$	SD	$\bar{X}$	SD
1	4.00	1.09	3.55	1.40	3.11	1.53	2.00	----	3.00	0.81	3.75	0.95	3.46	1.31
2	1.66	0.81	2.34	1.15	1.33	0.86	3.00	----	3.50	0.57	3.00	1.41	2.23	1.18
3	1.83	0.40	2.30	0.92	2.22	1.39	3.00	----	2.75	0.50	3.25	1.25	2.36	1.00
4	2.00	1.26	2.34	1.19	1.88	1.16	2.00	----	2.25	0.50	2.75	1.50	2.23	1.14
5a	2.00	1.26	2.61	1.05	1.66	1.32	2.00	----	2.75	0.95	3.25	1.25	2.23	1.16
b	2.00	1.26	2.13	0.96	1.44	1.01	3.00	----	2.50	0.57	3.25	1.25	2.12	1.07
6	2.50	1.04	2.56	1.19	1.88	1.53	1.00	----	3.00	0.81	3.00	0.81	2.46	1.21
7	1.83	0.75	2.65	1.11	1.33	1.00	1.00	----	3.25	0.50	3.25	1.25	2.36	1.18
8	2.16	0.98	2.26	1.05	1.88	1.26	2.00	----	2.75	0.50	3.75	0.95	2.34	1.10
9	2.33	0.81	2.78	0.95	1.88	1.16	3.00	----	3.00	0.81	3.75	0.95	2.66	1.04
10	2.33	0.81	2.30	0.82	1.77	1.20	3.00	----	2.50	0.57	3.25	1.25	2.31	0.95
11	2.83	0.75	3.08	1.04	2.44	1.87	2.00	----	2.50	0.57	2.75	1.50	2.83	1.20
12	2.83	0.98	3.00	0.90	2.22	1.64	1.00	----	2.50	0.57	3.25	1.50	2.76	1.14
13	3.33	0.81	2.69	0.92	1.77	1.20	3.00	----	2.25	0.50	4.25	0.50	2.70	1.10
14	2.66	1.03	2.43	1.03	1.77	1.20	2.00	----	2.75	0.50	4.25	0.50	2.51	1.14
15a	2.83	1.16	2.17	1.11	1.33	1.00	1.00	----	1.75	0.50	2.75	1.50	2.08	1.15
b	2.66	1.03	2.34	1.22	1.33	1.00	1.00	----	1.75	0.50	2.75	1.50	2.14	1.19
16	2.16	0.98	2.21	0.90	1.77	1.09	1.00	----	2.75	0.95	2.75	1.50	2.19	1.01
17a	2.50	1.04	2.43	0.66	1.88	1.26	1.00	----	2.25	0.50	2.25	1.89	2.27	0.97
b	2.50	1.04	2.47	0.66	1.77	1.30	3.00	----	2.50	0.57	2.25	1.89	2.34	0.98

SET 2

TABLE 1a) Perceptions of Joint Identification of Research Problems as a Possible Area of Collaboration between the University of Swaziland-Faculty of Agriculture (UNISWA) and the Malkerns Agricultural Research Station (MARS) Held by the University Teaching Staff and the Malkerns Research Personnel in Swaziland (N=47).

	YEARS OF PROFESSIONAL EXPERIENCE								SEX				OVERALL	
	N = 23		N = 12		N = 8		N = 4		N = 36		N = 11		N = 47	
	<5		>5 <10		>10 <15		> 15		M		F			
	$\bar{X}$	SD	$\bar{X}$	SD	$\bar{X}$	SD	$\bar{X}$	SD	$\bar{X}$	SD	$\bar{X}$	SD	$\bar{X}$	SD
1	1.39	0.58	1.58	0.90	1.50	1.06	1.50	0.57	1.50	0.81	1.36	0.50	1.46	0.74
2	1.91	0.79	1.83	0.93	2.12	0.99	1.75	0.50	1.67	0.54	2.37	1.08	1.91	0.83
3	1.48	0.94	1.75	1.05	2.00	1.30	2.25	1.50	1.51	0.89	2.05	1.34	1.70	1.08
4	1.87	0.69	1.91	0.90	2.12	0.93	2.25	1.25	2.02	0.84	1.72	0.54	1.95	0.90
5	2.04	1.05	2.41	1.31	1.50	0.53	1.75	0.51	1.66	1.18	1.81	0.40	2.02	1.05
6 a	1.87	0.86	1.50	0.90	2.12	1.24	1.75	0.95	1.66	0.99	2.27	1.00	1.90	0.94
b	2.50	1.11	2.33	0.77	3.00	1.19	3.00	--	2.72	1.11	2.36	0.50	2.63	1.00
7	1.87	0.96	2.00	1.34	2.25	1.48	3.00	0.81	2.08	1.18	2.00	1.00	2.06	1.13
8	1.95	0.75	2.08	0.79	2.37	1.50	3.25	0.95	2.11	1.00	2.36	0.92	2.17	0.98
9	1.73	0.86	1.16	0.38	1.62	1.06	2.00	1.41	1.63	0.93	1.45	0.68	1.59	0.87

SET 3

TABLE 1b) Perceptions of Joint Securing of Funds as a Possible Area of Collaboration between the University of Swaziland-Faculty of Agriculture (UNISWA) and the Malkerns Agricultural Research Station (MARS) Held by the University Teaching Staff and the Malkerns Research Personnel in Swaziland (N=47).

	YEARS OF PROFESSIONAL EXPERIENCE								SEX				OVERALL	
	N = 23 <5		N = 12 >5 <10		N = 8 >10 <15		N = 4 > 15		N = 36 M		N = 11 F		N = 47	
	$\bar{X}$	SD	$\bar{X}$	SD	$\bar{X}$	SD	$\bar{X}$	SD	$\bar{X}$	SD	$\bar{X}$	SD	$\bar{X}$	SD
1	1.91	1.04	1.75	1.05	1.87	1.24	2.00	0.81	1.77	1.04	2.18	0.98	1.87	1.03
2	1.73	0.96	1.50	0.79	1.37	0.74	1.75	0.50	1.66	0.89	1.45	0.68	1.61	0.84
3 a	1.87	1.05	1.91	0.90	1.75	1.28	2.00	0.81	1.83	1.00	2.00	1.09	1.87	1.01
b	1.91	1.04	1.50	0.67	1.37	0.91	2.50	1.91	1.75	1.10	1.81	0.87	1.76	1.04
4	2.04	1.02	1.83	1.11	1.25	0.88	2.25	0.95	1.91	1.10	1.72	0.78	1.87	1.02
5	1.43	0.72	1.50	0.52	1.25	0.70	2.00	0.81	1.44	0.60	1.54	0.93	1.46	0.68
6	1.30	0.55	1.25	0.45	1.00	0.53	1.25	0.50	1.27	0.56	1.09	0.30	1.23	0.52
7	1.47	0.66	1.66	0.65	1.00	0.53	2.00	0.81	1.38	0.68	1.81	0.60	1.48	0.68
8	1.65	0.64	2.25	0.75	1.50	1.19	1.75	0.50	1.80	0.85	1.72	0.64	1.78	0.80
9	1.87	0.69	2.00	0.85	1.50	1.19	1.75	0.50	1.83	0.87	1.81	0.60	1.83	0.81

SET 3

TABLE 1c) Perceptions of Advancement of Staff as a Possible Area of Collaboration between the University of Swaziland-Faculty of Agriculture (UNISWA) and the Malkerns Agricultural Research Station (MARS) Held by the University Teaching Staff and the Malkerns Research Personnel in Swaziland (N=47).

	YEARS OF PROFESSIONAL EXPERIENCE								SEX				OVERALL	
	N = 23 <5		N = 12 >5 <10		N = 8 >10 <15		N = 4 > 15		N = 36 M		N = 11 F		N = 47	
	$\bar{X}$	SD	$\bar{X}$	SD	$\bar{X}$	SD	$\bar{X}$	SD	$\bar{X}$	SD	$\bar{X}$	SD	$\bar{X}$	SD
1	1.73	1.05	1.66	0.65	2.12	0.83	2.00	1.41	1.69	0.85	2.18	1.16	1.80	0.94
2	2.04	0.76	1.91	0.79	2.87	1.24	8.50	1.73	2.19	1.09	2.18	0.60	2.19	0.99
3	1.95	0.82	1.91	0.90	1.50	1.06	1.75	0.95	1.77	0.92	2.09	0.70	1.85	0.88
4	1.82	0.77	1.66	0.65	1.75	1.03	2.00	0.81	1.63	0.72	2.27	0.78	1.78	0.77
5	1.78	0.73	1.66	0.88	1.37	0.51	1.50	0.57	1.55	0.69	2.00	0.77	1.66	0.73
6	1.30	0.43	1.66	0.65	1.12	0.35	1.25	0.50	1.27	0.51	1.63	0.50	1.36	0.52
7	1.60	0.89	1.58	0.66	1.25	0.35	1.25	0.50	1.30	0.52	2.09	1.04	1.48	0.74
8	2.08	1.04	2.16	0.83	2.50	0.92	3.50	1.00	2.33	0.98	2.18	1.16	2.29	1.02
9	2.04	0.97	2.16	0.71	2.37	1.30	2.25	1.89	2.27	1.13	1.72	0.46	2.14	1.04
10	2.08	0.90	1.91	0.66	1.75	0.70	2.75	0.95	1.94	0.82	2.36	0.80	2.04	0.83
11	1.87	0.81	1.83	0.93	1.50	0.53	2.00	0.81	1.75	0.80	2.00	0.77	1.80	0.79
12	1.65	0.77	1.33	0.49	1.37	0.74	1.25	0.50	1.44	0.73	1.63	0.50	1.48	0.68
13	1.39	0.58	1.58	0.66	1.25	0.46	1.75	0.95	1.44	0.65	1.45	0.52	1.44	0.61
14	1.87	0.69	2.33	0.88	2.25	1.03	2.50	1.29	2.13	0.86	2.00	0.89	2.10	0.86
15	1.91	0.99	2.08	1.16	1.87	1.12	2.50	1.29	2.11	1.14	1.63	0.67	2.00	1.06
16a	1.73	0.86	1.66	0.65	1.12	0.35	1.75	0.95	1.66	0.79	1.45	0.68	1.61	0.76
b	1.60	0.83	1.50	0.52	1.12	0.35	1.75	0.95	1.55	0.73	1.35	0.67	1.51	0.71

SET 3

TABLE 1d) Perceptions of Training of Students in Various Agricultural Disciplines as a Possible Area of Collaboration between the University of Swaziland-Faculty of Agriculture (UNISWA) and the Malkerns Agricultural Research Station (MARS) Held by the University Teaching Staff and the Malkerns Research Personnel in Swaziland (N=47).

	YEARS OF PROFESSIONAL EXPERIENCE								SEX				OVERALL	
	N = 23 <5		N = 12 >5 <10		N = 8 >10 <15		N = 4 > 15		N = 36 M		N = 11 F		N = 47	
	$\bar{X}$	SD	$\bar{X}$	SD	$\bar{X}$	SD	$\bar{X}$	SD	$\bar{X}$	SD	$\bar{X}$	SD	$\bar{X}$	SD
1	1.69	0.55	1.66	0.65	1.75	1.38	3.25	0.95	1.88	0.79	1.63	0.50	1.83	0.89
2	1.95	0.82	2.16	1.11	1.62	0.91	2.75	0.95	2.02	1.02	2.00	0.63	2.02	0.94
3	1.48	0.73	1.66	0.88	1.25	0.46	2.25	0.50	1.52	0.81	1.63	0.50	1.55	0.74
4	1.78	0.85	1.75	0.75	1.50	0.75	2.50	1.00	1.72	0.81	2.00	0.89	1.78	0.83
5	1.87	0.69	1.75	0.75	1.50	0.75	2.00	0.00	1.75	0.73	1.90	0.53	1.78	0.69
6	1.82	0.93	1.83	0.71	1.50	0.75	2.75	0.95	1.88	0.97	1.72	1.46	1.85	0.88
7	1.73	1.01	1.50	0.52	1.25	0.46	2.75	1.50	1.66	1.01	1.72	0.64	1.68	0.93
8a	2.26	1.09	1.83	0.83	2.00	0.73	2.75	1.50	2.13	1.07	2.18	0.87	2.14	1.02
b	2.39	1.03	1.83	0.83	2.00	0.75	3.25	1.50	2.22	1.09	2.36	0.80	2.25	1.03
c	2.17	1.15	1.91	0.91	2.00	0.75	3.00	1.41	2.16	1.10	2.09	0.94	2.14	1.06
9	1.39	0.49	1.33	0.49	1.37	0.51	1.75	0.50	1.33	1.47	1.63	0.50	1.40	0.49
10	1.52	0.59	1.41	0.51	1.25	0.46	2.25	0.50	1.41	0.55	1.81	0.61	1.51	0.58
11	1.73	0.61	1.50	0.67	1.37	0.51	2.75	0.95	1.72	0.77	1.63	0.50	1.70	0.72
12	1.91	1.04	1.66	0.98	2.12	1.35	2.75	0.95	1.88	1.00	2.18	1.32	1.95	1.08
13	3.13	1.25	2.41	0.79	2.75	1.48	3.50	1.29	2.86	1.24	3.09	1.13	2.91	1.21
14	2.26	0.91	1.91	0.90	2.00	0.75	2.75	0.95	2.33	0.92	1.63	0.50	2.17	0.89
15	2.73	1.32	2.58	0.97	3.37	1.30	3.25	1.50	2.86	1.26	2.81	1.07	2.85	1.21
16	2.34	0.77	2.00	0.73	2.00	0.92	2.25	0.50	2.13	0.76	2.36	0.80	2.90	0.77
17	3.26	1.28	2.50	0.79	3.12	1.24	3.00	1.15	2.97	1.27	3.18	0.75	3.02	1.17

SET 3

TABLE 1e) Perceptions of Sharing Infrastructure and Physical Facilities as a Possible Area of Collaboration between the University of Swaziland-Faculty of Agriculture (UNISWA) and the Malkerns Agricultural Research Station (MARS) Held by the University Teaching Staff and the Malkerns Research Personnel in Swaziland (N=47).

	YEARS OF PROFESSIONAL EXPERIENCE								SEX				OVERALL	
	N = 23		N = 12		N = 8		N = 4		N = 36		N = 11		N = 47	
	<5		>5 <10		>10 <15		> 15		M		F			
	$\bar{X}$	SD	$\bar{X}$	SD	$\bar{X}$	SD	$\bar{X}$	SD	$\bar{X}$	SD	$\bar{X}$	SD	$\bar{X}$	SD
1a	1.56	0.78	1.58	0.99	1.50	0.53	3.00	1.82	1.77	0.98	1.36	0.92	1.68	0.98
b	1.56	0.78	1.41	0.51	1.50	0.53	2.50	1.73	1.68	0.88	1.27	0.46	1.59	0.82
2a	1.43	0.66	1.50	0.67	1.37	0.51	2.50	1.73	1.58	0.87	1.36	0.50	1.53	0.80
b	1.78	0.79	1.83	1.03	2.12	1.12	3.25	1.70	2.02	1.10	1.81	0.87	1.97	1.05
3a	2.82	1.33	2.33	1.07	3.75	0.70	3.75	1.25	3.11	1.26	2.36	1.12	2.93	1.25
b	2.73	1.42	2.33	1.07	3.75	0.70	3.75	1.25	3.00	1.33	2.54	1.21	2.89	1.30
c	2.73	1.32	2.41	1.08	3.25	1.03	3.75	1.25	2.94	1.28	2.45	1.03	2.83	1.23
4a	2.13	1.10	2.33	0.98	2.00	1.06	3.75	1.25	2.38	1.17	2.00	1.00	2.29	1.14
b	2.04	1.02	2.16	0.71	1.75	0.70	3.75	1.25	2.25	1.07	1.90	0.83	2.17	1.02
c	2.26	1.01	2.33	0.77	1.87	0.83	2.75	1.50	2.25	0.96	2.27	1.00	2.25	0.96
d	2.47	1.20	2.33	0.88	2.87	1.55	3.75	1.25	2.55	1.25	2.81	1.16	2.61	1.22
5	1.82	0.83	1.91	0.66	2.87	0.99	3.75	1.25	2.33	1.09	1.72	0.64	2.19	1.03
6a	2.95	1.18	2.58	1.16	3.37	1.06	3.75	1.25	3.02	1.23	2.90	1.04	3.00	1.18
b	2.60	0.98	2.58	0.90	3.62	0.74	4.00	1.41	3.02	1.08	2.45	0.93	2.89	1.06
c	2.08	0.94	2.16	0.57	2.75	1.48	3.00	1.15	2.38	1.10	2.00	0.63	2.29	1.02
7a	2.21	0.99	2.00	1.04	1.75	0.70	3.25	1.50	2.11	1.03	2.36	1.12	2.17	1.04
b	2.00	1.04	1.50	1.52	2.00	1.06	3.75	1.25	1.94	1.06	2.27	1.92	2.02	1.09
8	1.47	0.73	1.33	0.49	1.25	0.46	2.50	1.73	1.47	0.87	1.54	0.52	1.48	0.80
9	1.56	0.89	1.66	0.77	1.25	0.46	2.75	1.70	1.63	1.01	1.63	0.67	1.63	0.94
10a	3.13	1.18	3.08	1.31	3.37	1.06	3.75	1.25	3.27	1.23	3.00	1.00	3.21	1.17
b	3.08	1.16	2.91	1.31	3.50	0.92	3.75	1.25	3.30	1.16	2.72	1.10	3.17	1.16
11	1.82	0.88	1.83	0.38	1.87	0.64	3.00	1.82	2.05	0.95	1.54	0.52	1.93	0.89
12	2.17	1.23	2.33	1.15	2.50	1.41	3.75	1.25	2.55	1.33	1.90	0.94	2.40	1.28
13a	1.91	0.94	1.91	0.90	2.62	1.50	3.00	1.41	2.13	1.15	2.09	1.04	2.12	1.11
b	1.87	0.81	1.83	0.83	2.06	1.50	3.00	1.41	2.13	1.09	1.90	0.94	2.08	1.06
14	1.73	0.75	1.83	0.71	1.50	0.53	3.25	1.70	1.91	0.99	1.63	0.50	1.85	0.90
15	1.91	0.94	2.00	1.20	1.50	0.53	3.00	1.41	2.00	1.09	1.81	0.87	1.95	1.04

SET 3

TABLE 2) Perceptions of Impeding Factors to Collaboration between the University of Swaziland-Faculty of Agriculture (UNISWA) and the Malkerns Agricultural Research Station (MARS) Held by the University Teaching Staff and the Malkerns Research Personnel in Swaziland (N=47).

	YEARS OF PROFESSIONAL EXPERIENCE								SEX				OVERALL	
	N = 23 <5		N = 12 >5 <10		N = 8 >10 <15		N = 4 > 15		N = 36 M		N = 11 F		N = 47	
	$\bar{X}$	SD	$\bar{X}$	SD	$\bar{X}$	SD	$\bar{X}$	SD	$\bar{X}$	SD	$\bar{X}$	SD	$\bar{X}$	SD
1	3.21	1.34	3.83	1.26	3.75	1.48	3.25	0.95	3.55	1.34	3.18	1.25	3.46	1.31
2	2.30	1.22	2.08	1.08	2.00	1.41	2.75	0.95	2.19	1.19	2.36	1.20	2.23	1.18
3	2.17	0.83	2.16	1.11	3.00	1.19	2.75	0.95	2.44	1.10	2.09	0.53	2.36	1.00
4	2.39	1.07	1.75	0.96	2.12	1.35	3.00	1.41	2.25	1.25	2.18	0.75	2.23	1.14
5a	2.39	0.94	1.75	1.21	2.12	1.45	3.00	1.41	2.33	1.19	1.90	1.04	2.23	1.16
b	2.21	0.79	1.58	0.99	2.25	1.48	3.00	1.41	2.27	1.13	1.63	0.67	2.12	1.07
6	2.43	1.12	2.33	1.37	2.37	1.40	3.25	0.95	2.52	1.13	2.27	1.48	2.45	1.21
7	2.52	1.12	2.00	1.12	2.25	1.58	2.75	0.95	2.36	1.12	2.36	1.43	2.36	1.18
8	2.26	0.91	2.08	1.31	2.62	1.40	3.00	0.81	2.41	0.79	2.09	1.22	2.34	1.10
9	2.69	0.82	2.41	1.37	2.62	1.18	3.25	0.95	2.75	0.96	2.36	1.28	2.66	1.04
10	2.39	0.72	1.83	1.11	2.50	1.19	3.00	0.81	2.36	0.93	2.18	1.07	2.31	0.95
11	2.95	1.10	2.25	1.35	3.37	1.18	2.75	0.95	2.86	1.19	2.75	1.27	2.83	1.20
12	2.73	0.96	2.66	1.43	2.62	1.40	3.50	0.57	2.72	1.11	2.90	1.30	2.76	1.14
13	2.60	0.89	2.75	1.54	2.87	1.12	2.75	0.95	2.88	1.00	2.09	1.22	2.70	1.10
14	2.52	0.99	2.25	1.42	2.62	1.30	3.00	0.81	2.52	1.10	2.45	1.29	2.51	1.14
15a	2.13	1.01	1.75	1.13	2.00	1.60	3.00	0.81	2.13	1.19	1.90	1.04	2.08	1.15
b	2.30	1.14	1.83	1.90	2.00	1.60	2.50	0.51	2.22	1.24	1.90	1.04	2.14	1.97
16	2.39	0.89	2.00	1.04	2.00	1.41	2.00	0.81	2.16	0.94	2.27	1.27	2.19	1.01
17a	2.30	0.63	1.91	1.16	2.75	1.48	2.25	0.50	2.36	1.01	2.00	0.77	2.27	0.97
b	2.34	0.71	1.91	1.16	3.00	1.30	2.25	0.50	2.47	1.00	1.90	0.83	2.34	0.98

SET 4

TABLE 1a) Perceptions of Joint Identification of Research Problems as a Possible Area of Collaboration between the University of Swaziland-Faculty of Agriculture (UNISWA) and the Malkerns Agricultural Research Station (MARS) Held by the University Teaching Staff and the Malkerns Research Personnel in Swaziland (N=47).

	SWAZI N = 31		OTHER N = 16		OVERALL N = 47	
	$\bar{X}$	SD	$\bar{X}$	SD	$\bar{X}$	SD
1	1.38	0.66	1.62	0.88	1.46	0.74
2	1.67	0.54	2.37	1.08	1.91	0.83
3	1.51	0.89	2.06	1.34	1.70	1.08
4	1.87	0.61	2.12	1.08	1.95	0.80
5	2.06	1.03	1.93	1.12	2.02	1.05
6 a	1.90	0.97	1.62	0.88	1.80	0.94
b	2.51	0.85	2.87	1.25	2.63	1.00
7	1.83	0.96	2.50	1.31	2.06	1.31
8	1.90	0.79	2.68	1.13	2.17	0.98
9	1.51	0.76	1.75	1.06	1.59	0.87

SET 4

TABLE 1b) Perceptions of Joint Securing of Funds as a Possible Area of Collaboration between the University of Swaziland-Faculty of Agriculture (UNISWA) and the Malkerns Agricultural Research Station (MARS) Held by the University Teaching Staff and the Malkerns Research Personnel in Swaziland (N=47).

	SWAZI N = 31		OTHER N = 16		OVERALL N = 47	
	$\bar{X}$	SD	$\bar{X}$	SD	$\bar{X}$	SD
1	1.83	1.00	1.93	1.12	1.87	1.03
2	1.54	0.67	1.75	1.12	1.61	0.84
3 a	1.93	0.92	1.75	1.18	1.87	1.01
b	1.67	0.74	1.93	1.48	1.76	1.04
4	1.90	0.97	1.81	1.16	1.87	1.03
5	1.41	0.67	1.56	0.72	1.46	0.68
6	1.61	0.37	1.37	0.71	1.23	0.52
7	1.45	0.62	1.56	0.81	1.48	0.68
8	1.77	0.66	1.81	1.04	1.78	0.80
9	1.77	0.71	1.93	0.99	1.83	0.81

SET 4

TABLE 1c) Perceptions of Advancement of Staff as a Possible Area of Collaboration between the University of Swaziland-Faculty of Agrilcuture (UNISWA) and the Malkerns Agricultural Research Station (MARS) Held by the University Teaching Staff and the Malkerns Research Personnel in Swaziland (N=47).

	SWAZI N = 31		OTHER N = 16		OVERALL N = 47	
	$\bar{X}$	SD	$\bar{X}$	SD	$\bar{X}$	SD
1	1.74	0.93	1.93	0.99	1.80	0.94
2	1.87	0.71	2.81	1.16	2.19	0.99
3	1.83	0.86	1.87	0.95	1.85	0.88
4	1.77	0.71	1.81	0.91	1.78	0.77
5	1.77	0.80	1.43	0.51	1.66	0.73
6	1.48	0.57	1.12	0.34	1.36	0.52
7	1.64	0.83	1.18	0.40	1.48	0.74
8	1.96	0.91	2.93	0.92	2.29	1.02
9	1.87	0.67	2.68	1.40	2.14	1.04
10	2.03	0.83	2.06	0.85	2.04	0.83
11	1.87	0.80	1.68	0.79	1.80	0.79
12	1.32	0.47	1.81	0.91	1.48	0.68
13	1.41	0.62	1.50	0.63	1.44	0.61
14	2.00	0.77	2.31	1.01	2.10	0.86
15	1.89	1.05	2.25	1.06	2.00	1.06
16a	1.64	0.75	1.56	0.81	1.61	0.76
b	1.48	0.67	1.58	0.81	1.51	0.71

SET 4

TABLE 1d) Perceptions of Training of Students in Various Agricultural Disciplines as a Possible Area of Collaboration between the University of Swaziland-Faculty of Agrilcuture (UNISWA) and the Malkerns Agricultural Research Station (MARS) Held by the University Teaching Staff and the Malkerns Research Personnel in Swaziland (N=47).

	SWAZI N = 31		OTHER N = 16		OVERALL N = 47	
	$\bar{X}$	SD	$\bar{X}$	SD	$\bar{X}$	SD
1	1.67	0.59	2.12	1.25	1.83	0.89
2	1.96	0.94	2.12	0.95	2.02	0.94
3	1.58	0.84	1.50	0.51	1.55	0.74
4	1.64	0.79	2.06	0.85	1.78	0.83
5	1.71	0.69	1.93	0.68	1.78	0.69
6	1.74	0.89	2.06	0.85	1.85	0.88
7	1.45	0.62	2.12	1.25	1.68	0.93
8a	1.96	0.94	2.50	1.09	2.14	1.02
b	2.03	0.94	2.68	1.07	2.25	1.03
c	1.90	0.97	2.62	1.08	2.14	1.06
9	1.35	0.48	1.50	0.51	1.40	0.49
10	1.48	0.57	1.56	0.62	1.51	0.58
11	1.48	0.50	2.12	0.88	1.70	0.72
12	1.90	1.07	2.06	1.12	1.95	1.08
13	2.71	1.31	2.31	1.30	2.91	1.21
14	2.06	0.89	2.37	0.88	2.17	0.89
15	2.45	1.09	3.62	1.08	2.85	1.21
16	2.12	0.76	2.31	0.79	2.19	0.77
17	2.74	1.09	3.56	1.15	3.02	1.77

SET 4

TABLE 1e) Perceptions of Sharing Infrastructure and Physical Facilities as a Possible Area of Collaboration between the University of Swaziland-Faculty of Agriculture (UNISWA) and the Malkerns Agricultural Research Station (MARS) Held by the University Teaching Staff and the Malkerns Research Personnel in Swaziland (N=47).

	SWAZI N = 31		OTHER N = 16		OVERALL N = 47	
	$\bar{X}$	SD	$\bar{X}$	SD	$\bar{X}$	SD
1a	1.54	0.98	1.93	0.99	1.68	0.98
b	1.51	0.85	1.75	0.77	1.59	0.82
2a	1.51	0.85	1.56	0.72	1.53	0.80
b	2.03	1.08	1.87	1.02	1.97	1.05
3a	2.58	1.25	3.62	0.95	2.97	1.25
b	2.51	1.31	3.62	0.95	2.89	1.30
c	2.41	1.17	3.62	0.95	2.83	1.23
4a	2.03	1.11	2.81	1.04	2.29	1.14
b	1.87	0.88	2.75	1.06	2.17	1.02
c	2.00	0.96	2.75	0.77	2.25	0.96
d	2.32	1.27	3.18	0.91	2.67	1.22
5	1.87	0.95	2.81	0.91	2.91	1.03
6a	2.87	1.28	3.25	0.93	3.00	1.18
b	2.61	1.08	3.43	0.81	2.89	1.06
c	2.12	0.99	2.62	1.02	2.29	1.02
7a	2.00	1.06	2.50	0.96	2.17	1.04
b	1.77	1.02	2.50	1.09	2.02	1.09
8	1.41	0.84	1.62	0.71	1.48	0.80
9	1.51	0.92	1.87	0.95	1.63	0.94
10a	3.16	1.26	3.31	1.01	3.21	1.17
b	3.16	1.29	3.18	0.91	3.17	1.16
11	1.74	0.81	2.31	0.94	1.93	0.89
12	2.06	1.18	3.06	1.23	2.40	1.28
13a	2.06	1.20	2.25	0.93	2.12	1.11
b	2.00	1.12	2.25	0.93	2.08	1.06
14	1.67	0.87	2.18	0.91	1.85	0.90
15	1.93	1.15	2.00	0.81	1.95	1.04

SET 4

TABLE 2) Perceptions of Impeding Factors to Collaboration between the University of Swaziland-Faculty of Agriculture (UNISWA) and the Malkerns Agricultural Research Station (MARS) Held by the University Teaching Staff and the Malkerns Research Personnel in Swaziland (N=47).

	SWAZI N = 31		OTHER N = 16		OVERALL N = 47	
	$\bar{X}$	SD	$\bar{X}$	SD	$\bar{X}$	SD
1	3.19	1.42	4.00	0.89	3.46	1.31
2	2.06	1.15	2.56	1.20	2.23	1.18
3	2.32	0.90	2.43	1.20	2.36	1.00
4	2.06	0.92	2.56	1.45	2.23	1.14
5a	2.06	1.09	2.56	1.26	2.23	1.16
b	1.90	0.90	2.56	1.26	2.12	1.07
6	2.38	1.35	2.62	0.88	2.46	1.21
7	2.12	1.14	2.81	1.16	2.36	1.18
8	2.00	1.00	3.00	1.03	2.34	1.10
9	2.54	1.06	2.87	1.02	2.66	1.04
10	2.19	0.91	2.56	1.03	2.31	0.95
11	2.77	1.30	2.93	0.99	2.83	1.20
12	2.56	1.18	3.25	0.93	2.76	1.14
13	2.48	1.12	3.12	0.95	2.70	1.10
14	2.41	1.17	2.68	1.07	2.51	1.14
15a	1.61	0.84	3.00	1.15	2.08	1.15
b	1.64	0.87	3.12	1.14	2.14	1.19
16	2.00	0.96	2.56	1.03	2.19	1.01
17a	2.12	0.95	2.56	0.96	2.27	0.97
b	2.19	0.98	2.62	0.95	2.34	0.98

Appendix I

VITA

PERSONAL DATA:

Name: Musa M. A. Dube
Place of Birth: Lundzindzaneni, Swaziland.
Date of Birth: December 10, 1956.
Nationality: Swazi
Height: 5'8"
Marital Status: Married
Address: Box 2041, Manzini. Swaziland.

Education:

1963-1969: Primary Education at Mafutseni Roman Catholic School.
1970-1972: Junior Secondary Education at St. Joseph's Secondary School.
1973-1974: Senior Education at Salesian High School.
1975-1976: Certificate in Community Development at Staff Training Institute, Mbabane.
1976-1978: Diploma in Agricultural Education at Luyengo, University of Botswana and Swaziland (UBS).
1981-1982: Bachelor of Science Degree in Agriculture, Majoring in Agricultural Education at West Virginia University (USA) in Morgantown.

TEACHING EXPERIENCE

May, 1978-April, 1979: Taught Agriculture at Salesian High School.

May, 1979-December, 1980:	A Technician at U.B.S. Department of AEEEE, taught Agriculture of Swaziland to certificate students and a course in construction skills to Ag. Ed. diploma students.
February, 1982-May, 1982	Student taught Vocational Agriculture at Ripley High School in the State of West Virginia, USA.
September, 1982-August, 1984:	Taught at UNISWA - Psychology. Educational and Technology. School Organization and Management, team taught Principles of Teaching and supervised Students Teaching.

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