THE DEVELOPMENTAL STAGES AND EVALUATION OF THE CURRENT CURRICULUM OF THE FACULTY OF AGRICULTURE, UNIVERSITY OF KHARTOUM, AND ITS RELEVANCE TO THE GRADUATES' NEEDS

By

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A thesis submitted in partial fulfillment of the Degree of Master of Science (Agric.) to the University of Khartoum.

DEPARTMENT OF RURAL ECONOMY
FACULTY OF AGRICULTURE
UNIVERSITY OF KHARTOUM
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DEDICATION

To my parents, Mohamed el Hassan Mohamed Khair and Arrada Abdalla, with deepest gratitude and affection.
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ABSTRACT

A major problem of education in Sudan, is the suitability and fitness of the instructional contents studied in higher education regarding the actual jobs held by the graduates. This study addresses itself to the evaluation of the curriculum of the Faculty of Agriculture, University of Khartoum, the main institution for granting the B.Sc. (Agric.) degree in the country. It tries to show the pros and cons of the faculty's educational programs through a follow-up study of its graduates. A sample of 120 graduates was taken from different graduation years and of different types of jobs by the quota sampling method which was deemed most appropriate for the study, as it permits non-random selection within the strata. The data-collection instrument was a two-part questionnaire, built up through an intensive examination of the developmental stages of the faculty's curriculum which has always been subject to constant change and review according to the country's agricultural needs. The questionnaire was designed to collect information about the graduate's job situation and its relevance to the
Curriculum in the faculty, i.e., objectives, learning experiences, organization of learning experiences, and evaluation methods used.

The study follows the scientific patterns of evaluating curricula and the conclusions of the evaluation were as follows:

- Partial satisfaction of the graduates' educational needs by the faculty's programs.
- Imperfect relationship between the curriculum and the actual jobs available for the graduates and their demands for more relevant skills and knowledge to improve this relationship.

Many factors that have contributed to the above aspects have been specified in the study, and suggestions for improvement have been recommended. These recommendations are related to the review of the current objectives formulated in 1964, selection of teaching methods with regard to practical work and field training, improvement of teaching facilities, namely laboratories and classrooms, organization of
of learning experiences (by more concern on the option system and promotion of the semester system to the course unit system), review and rearrangement of the options existing in the Faculty of Agriculture to fit the type of work available.
Sudan, the largest country in Africa, has an area of about 2,5 million square kilometers. It extends from desert and semi desert in the north to equatorial forests in the extreme south. It has a population of about 21,592,832 as appeared in the 1983 census, with an approximate annual growth rate of 2.3%. The country has a mean density of 9 inhabitants per square km, one of the lowest in the world.

Importance of Agriculture to the Sudan Economy

Sudan is blessed with rich natural resources. It includes large areas of suitable land for agricultural activities, especially in the savannah regions with the geese areas in the west and the clay plain in the course.

Most of Sudan lies within the catchment of the Nile. The net available average annual river flow equals 86 billion cubic meters. About 10 billion cubic meters are lost by evaporation from the water surface of Geeser lakes behind Aswan dam, and of the
remaining 76 million cubic meters, 33 million cubic meters are utilized by Egypt and about 18.5 million cubic meters are available for Sudan. This is according to the 1959 Nile Water Agreement between Sudan and Egypt. Besides this, Sudan has annual average rainfall ranging from 400 mm in the northern region to 800 and 1300 mm in the southern region.

Utilization of land in Sudan up to [1975] indicated that only 18.7 million, out of 200 million feddans suitable for agriculture, were cultivated (i.e. 9.3%). Pasture land is about 57.9 million feddans while forests cover about 217.9 million feddans. Live stock population in that year was 15.3 million, 13.7 million, 19.6 million, 2.7 million heads for cattle, sheep, goats and camels respectively. Live stock population annual growth rates for the period 1974-1977 were given as 3% for cattle, 5.7% for sheep, 3.6% for goats and 1.6% for camels.

Agriculture, with such huge natural resources, is considered as the basis of Sudan economy.
It provides livelihood for more than 83% of the population. More than 70% of the population is actively engaged in the production of cotton, sun arable crops, cereals, groundnuts, sesame and other food crops and animal husbandry. Agriculture represents about 40% of the Gross Domestic Product. The export of agricultural products represents more than 75% of the total export value. The possibilities for agricultural development are immense and considerable concern has been put on agriculture in the Six-Year Plan of Economic and Social Development 1977/78–1981/82. It was planned to invest about 2.67 billions Sudanese pounds during the years of this plan. Of this amount 75% were allocated to agriculture. The objectives of the Six-Year Plan towards agricultural development were as follows:

- To increase the production of irrigated crops by vertical expansion and improvement of agricultural services to support and protect crop production on irrigated lands.
- Improvement and strengthening of mechanised crop production schemes.

- Development and modernisation of traditional farming, improvement of conditions for nomads and modernisation of pastoral activities.

- Development of animal health, control of diseases and integration of livestock together with production of crops in existing agricultural schemes.

- Soil conservation, preservation of forests, checking of desert creep, and increase in the production of forest products and gum arable.

- Improvement of services and facilities needed by agriculture like transportation, electrification of irrigation pumping sets, drinking water resources, storage facilities and organization of marketing system and trade.
- Development of wildlife and fisheries and improvement of fishermen's conditions.

However, it is important to note that after the widespread executing of new agricultural schemes during the application of the 5-year plan (1970/71 - 1974/75), the horizontal economic development graph declined, and all development activities were directed towards stabilizing and improving the schemes already established. The trend to rehabilitate the old schemes was considered the best solution to save those agricultural schemes from complete failure. Cotton production for example was at its lowest yields per feddan in Gezira Scheme. In this respect the government introduced what was known as the Three Phases Investment Programme. In this programme each phase was planned to last three years, starting from the year 1970/71. These short and medium plans were enforced in order that the government be able to review and improve the already existing schemes, and at the same time stop investing in new projects and concentrate on improving the essential requirements of infra structure such as road transportation.
Fairly enough, the share of agricultural production development in these short term plans was the largest compared with the other sectors of the economy. Being the largest export producer, the agricultural sector enjoys a big share out of the plans funds. The first three years plan was drawn in such a way as to invest in all sectors, an amount of £ 738 million, out of which agricultural sector was granted £ 248 million. The agricultural sector in the Sudan still contributes 5% of the national gross production. The sector also provides labour for 80% of the Sudanese population and a greater portion of the Sudan export products.

Manpower Needs for Agricultural Development

One of the main constraints to fulfil the ambitious Six-Year Plan, as it was planned, was the shortage of trained manpower specially qualified technicians. In agriculture alone, about 19,000 technicians were estimated to be needed by the end of the Six-Year Plan.

In the 1974/75 the total university agriculture graduates requirement was estimated to be 2030
whereas in 1985, the requirement is expected to be in the range of 3465 graduates. The corresponding number required of the intermediate level graduates was 6000 in 1974 and 1927 graduates in 1985. Similarly, for skilled workers the number required in 1974/75 was 20300 while that required in 1983 is expected to be 24850. In the southern region alone the manpower shortage in 1978 was estimated to be 460 agricultural technicians and 2,360 skilled agricultural labourers. The method used in calculating the manpower needs is to add the needs of the volumes of ongoing agricultural activities to those of projected developments.

As it is mentioned above, the Six-Year Plan did not realize its objectives and stated policy of creating new agricultural schemes was unfulfilled. The Six-Year Plan was substituted by the three phases investment programme the main objective of which is the rehabilitation of the existing deteriorating agricultural schemes. Due to the rehabilitation policy, and no more agricultural schemes have
been established the country could not be able to absorb and employ all the agricultural graduates for the last few years.

Agricultural Education in Sudan

In recent years, progress has been made not only in expanding technical and vocational education to meet skilled manpower needs but also in terms of broad reform directed at making education as a whole more responsive to social and economic development. Agricultural development is the core of social and economic development in Sudan and agricultural education is therefore supposed to be the most important tool of the agricultural development.

Generally speaking agricultural education in Sudan which is the most important type of vocational education is divided into three levels, namely:

1. Higher education (Degree).
2. Intermediate education (Diploma and certificates).
3. Farmer training and other forms of vocational and pre-vocational systems.
Sometimes the intermediate level is divided into two sub-levels:

i) higher intermediate level which includes post-secondary and sub-university institutions.

ii) lower intermediate level which includes the higher secondary agricultural schools.

Agricultural Education Policy in Sudan:
Past and Present

1. Prior to 1971, it could be said that education in the Sudan in general was predominantly academic. Yet there were a few technical schools incorporated in the national educational system. There was no plan or policy for agricultural education to cater for the agricultural development needs in quantity and quality.

2. The existing technical schools before 1971 were subject to frequent change and modifications. Those schools and training centres had no clear formulated objectives, no full idea about the needed numbers of graduates, their level of education, their
field of specialization. Consequently some schools and training centres were established and dismantled or closed haphazardly.

3. There were many reasons for closing down the agricultural schools and agricultural training centres. Some of these reasons were,

   a) Shortage of Funds
   b) Lack of Applicants
   c) No jobs for the graduates.
   d) No incentives or social support
   e) The concept of government employment was dominant among the graduates and the future applicants.

4. Due to the above mentioned reasons the agricultural school graduates who were basically technicians were small in numbers. There was an imbalance between the number of university graduates and the number of agricultural technicians i.e. the pyramid was inverted in shape and there were more degree holders than the diploma holders and technicians.
3. In 1970 a new educational policy was formulated and announced, the main emphasis of which was the importance of technical and vocational education. It was stated that this form of education will provide the country with highly qualified technicians of all types.

6. The year 1971 witnessed the implementation of the new educational policy. The technical schools have been changed from three years programme to four years programme. This change enabled students to cover with a reasonable depth the basic sciences and arts as well as the needed knowledge and skills in their particular field of study.

Various ministries including the Ministry of Agriculture indicated their readiness to help in formulating and designing curricula of these schools. Three more agricultural secondary schools were established in the same year. These schools are New Halfa-Kassala Province, Taiha-Gazira Province and Um Dawan Enn-Khartoum Province.
7. The foundations for two agricultural colleges were laid down in 1972. The two colleges are Abu Haraz in the Gezira Province and Abu Naama in the Blue Nile Province. The two colleges started to function in 1978. Both of them are now having more or less the same syllabus as Shomshat Agricultural Institute (now Shomshat Division for Agricultural Technicians belonging to Khartoum Polytechnic Institute). Abu Haraz College for Agriculture and Natural Resources puts more emphasis on irrigated agriculture in general and agricultural mechanization whereas Abu Naama College concentrates on rainfed agriculture and animal production. In 1973 Shomshat Agricultural Institute (established 1954) and Kuku Veterinary and Animal Husbandry Technicians Institute (established 1970) became two divisions under the administration of Khartoum Polytechnic Institute.

8. November 1973 witnessed the establishment of two more universities namely John University and Gezira University to promote and enhance rural development.
9. The Faculty of Agriculture, University of Khartoum has been and still the main institution for 3.Sc. Agriculture degree holders in Sudan. It was established in 1958\(^\text{10}\) and has gone through a number of changes to meet the national needs. A detailed historical background of the curriculum development will be presented in Chapter 2.

**Statement of the Problem**

One of the major problems of education in Sudan is the determination of the proper and appropriate objectives of the particular educational programme or institution. Selection of the best curriculum contents, learning experiences and organization of these learning experiences for achieving these objectives or goals remain also as big issues in the proper planning of education in Sudan.

These questions will of course have to be resolved at the beginning of the programme or initial establishment of the institution. In view of rapid social, economical and technological changes, however, these
objectives and methods must also be kept under constant review and updating if the whole programme or institution is to maintain its utility and viability.

These principles apply to the field of agricultural education more than most other fields because of the complexity of its subject-matter and methods and the changing nature of the needs to which it is supposed to respond. Sudanese specialists of agricultural education are no doubt aware of this problem and have attempted to deal with it at the various levels and stages of the various educational programmes and institutions in the country.

The Faculty of Agriculture, University of Khartoum, as mentioned before, had been established in 1936. The last major revision and reform of the objectives and methods of the Faculty was undertaken in 1954. It is high-time that the process be repeated in view of the tremendous changes in social, economical and technological factors contributing to the formulation of the objectives of the Faculty and the selection of
its curriculum content and instructional methods. Better insights and suggestions for reform may be obtained, however, if the questions are approached from the point of view of the graduates of the Faculty and their practical experience before and after graduation.

The problem may therefore be formulated in the following terms:

Firstly, are the current educational and training objectives of the Faculty of Agriculture, University of Khartoum appropriate in view of the actual needs of Sudan and the social and natural environments within which the graduates have to perform their functions?

Secondly, and assuming that the Faculty is seeking to achieve the appropriate objectives, are the curriculum contents, organization of learning experiences and assessment methods employed by the faculty effective in achieving those objectives?

As the Faculty has been in existence for nearly fifty years and graduated a sizable number of
agricultural engineers, it is thought better that the problem be approached from the point of view of the graduates and their practical experience.

**Objectives of the Study**

**General objectives**

This follow-up study seeks to assess the content and instructional aspects of the program of the Faculty of Agriculture, University of Khartoum, through the assessment of the performance, views, and impressions of its graduates. This general objective can be broken down into the following specific ones:

**Specific objectives**

1. To provide information about the different jobs that the faculty graduates can hold.

2. To study the history of the Faculty of Agriculture and review the curriculum development since its inception in 1938.

3. To shed light on post-graduation experience of the Faculty of Agriculture graduates and their social life.
4. To see the relevance or the relationship between the graduate studies and nature of their jobs.

5. To see the job satisfaction among the graduates.

6. To assess the syllabus and the course content in the Faculty of Agriculture.

Methodology

To obtain the data necessary for the conduct of the study, information of historical curriculum development is essential for construction of data collection method. In addition, information of the graduates field distribution to determine the selection of the population and sample used was employed.

1. Population

The Faculty of Agriculture has been graduating agricultural engineers since 1942. As shown in Table 1, a large number of students have completed studies in the Faculty. Due to the constant
evolution of the Faculty's structure, objectives, and curriculum, the progression of graduating classes had a wide variety of experiences in the Faculty. The most recent and important change in the Faculty's structure and organization, the implementation of the semester system and new department in 1976, is the object of the present study's evaluation. Thus, the population on which this study focuses is the group of students who graduated between 1973 and 1980. As the graduates of 1980/81 have experienced difficulties in securing employment, at data collection time, they have not been included in the study.

The total graduate population for the five years under consideration (1975-1980) is 930. These graduates are presented in Table 2 as classified by the Faculty. Table 3 indicates the students' options pursued, while Table 4 shows the graduates' field distribution after graduation. Details of distribution of graduates among the different agricultural schemes and other departments are presented in Table 5.
Table 2. Graduate classification on the basis of the B.Sc.(Agric.) Honours Degree.

<table>
<thead>
<tr>
<th>Graduation</th>
<th>Class I</th>
<th>Class II Division</th>
<th>Class II Division</th>
<th>Class III</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1975/76</td>
<td>3</td>
<td>35</td>
<td>84</td>
<td>47</td>
<td>169</td>
</tr>
<tr>
<td>1976/77</td>
<td>5</td>
<td>23</td>
<td>104</td>
<td>57</td>
<td>187</td>
</tr>
<tr>
<td>1977/78</td>
<td>7</td>
<td>45</td>
<td>102</td>
<td>48</td>
<td>202</td>
</tr>
<tr>
<td>1978/79</td>
<td>9</td>
<td>34</td>
<td>113</td>
<td>45</td>
<td>203</td>
</tr>
<tr>
<td>1979/80</td>
<td>7</td>
<td>13</td>
<td>87</td>
<td>45</td>
<td>172</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>29</strong></td>
<td><strong>179</strong></td>
<td><strong>280</strong></td>
<td><strong>241</strong></td>
<td><strong>530</strong></td>
</tr>
</tbody>
</table>

Source: Faculty of Agriculture

"Registrar's Office"
Table 4. Field Distribution of the Population Immediately after Graduation.

<table>
<thead>
<tr>
<th>Graduation Year</th>
<th>Teaching Agriculture and Research</th>
<th>Specialized Agriculture, Forest Service, and Technical Training</th>
<th>Emigration &amp; Jobs Not Related to Agriculture</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1975/76</td>
<td>12</td>
<td>53</td>
<td>93</td>
<td>188</td>
</tr>
<tr>
<td>1976/77</td>
<td>17</td>
<td>68</td>
<td>102</td>
<td>187</td>
</tr>
<tr>
<td>1977/78</td>
<td>13</td>
<td>43</td>
<td>140</td>
<td>202</td>
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<tr>
<td>1978/79</td>
<td>16</td>
<td>25</td>
<td>152</td>
<td>203</td>
</tr>
<tr>
<td>1979/80</td>
<td>17</td>
<td>67</td>
<td>71</td>
<td>172</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>75</strong></td>
<td><strong>266</strong></td>
<td><strong>561</strong></td>
<td><strong>920</strong></td>
</tr>
</tbody>
</table>

Sources:

Ministry of Agriculture & Irrigation:

1. Department of Financial & Administrative Affairs
   "Personal Office."
2. Different Departments & Agriculture Corporations.
Tables 6 and 7 give the current distribution of the graduates i.e., taking into consideration any transfer or shift from one department to the other.

These tables have been presented in order to give detail to the actual parameters of the population. As the study is an examination of the relationship between the graduates' jobs and the curriculum he/she pursued in the Faculty, it was essential to provide the information in the preceding tables. These informations also form the base from which graduates were purposefully sampled.

2. Sample and sampling method

The two most important parameters that determined the sample selected were the current field distribution of the graduates and their years of graduation from the Faculty.

Other parameters were found to be less significant because, for example, the classification of the population based on final examination results and the students' options were found to be related to their post-graduation employment. Students
Table 6. The current field distribution of the graduates population.

<table>
<thead>
<tr>
<th>Graduation year</th>
<th>Teaching and Research</th>
<th>Agric. Production schemes</th>
<th>Speci- alized Agric. Services</th>
<th>Jobs not related to Agric.</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1973/76</td>
<td>23</td>
<td>51</td>
<td>51</td>
<td>34</td>
<td>163</td>
</tr>
<tr>
<td>1975/77</td>
<td>22</td>
<td>51</td>
<td>73</td>
<td>31</td>
<td>187</td>
</tr>
<tr>
<td>1977/78</td>
<td>19</td>
<td>52</td>
<td>76</td>
<td>43</td>
<td>202</td>
</tr>
<tr>
<td>1978/79</td>
<td>26</td>
<td>55</td>
<td>93</td>
<td>43</td>
<td>200</td>
</tr>
<tr>
<td>1979/80</td>
<td>17</td>
<td>57</td>
<td>73</td>
<td>43</td>
<td>172</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>107</strong></td>
<td><strong>287</strong></td>
<td><strong>370</strong></td>
<td><strong>166</strong></td>
<td><strong>930</strong></td>
</tr>
</tbody>
</table>

Source:

1. Ministry of Agric. & Irrigation
   Department of Financial & Administrative Affairs "Personnel Office".
2. Different Departments & Agric. Corporations.
Performing well on the final examinations tend to be engaged in teaching or research following graduation. The departments of the faculty in which the students studied were somewhat related to their eventual job. In addition, the number of students graduating varies from year to year and this was taken into account in the sampling procedure. Also the sample was purposefully drawn from over the five years period in order to examine a wider spectrum of the graduates' views on the curriculum and its relevance to their jobs.

From the above discussion it is obvious that random sampling was thought to be not appropriate for this study. Instead, quota sampling, as discussed by Moser (1952) and Kraus and Miller (1974) was found to be more suitable.

As Moser states, "Quota sampling differs from random methods in several minor ways, but most fundamentally in, that, once the general break of the sample is decided and the quota assignments are
allocated to interviewers, the choice of the actual sample units to fit into this frame work is left to the interviewers. Quota sampling is therefore a method of stratified sampling in which the selection within strata is non-random. 

In further support of quota sampling, Kreuz and Miller add, "This is a method of sampling which is non random in that the selection of the final unit of enquiry is left to the judgment of the interviewers. There is an attempt here to produce representativeness by means of quota controls, by stratifying the sample to be chosen in terms of certain basic population characteristics about which information is available from census and other well established sources. Thus, certain proportions of interviews will be allocated according to such proportions extant in the population of the country (i.e. the statistical universe), that is in terms of area, town size, age, sex, occupation, etc. as well as specific controls being applied according to the subject of the survey, e.g. control..."
by educational attainments as, for instance, in a study which examines people's views regarding major changes in educational fields.

Thus the quota sampling method was deemed most appropriate as it permits non-random selection within the strata. The quota controls therefore is the current field distribution by type of work and the graduation years.

The sample of 120 graduates was taken from different graduation years and types of jobs, weighing the sample proportionality to the size of that class or members employed in that job as shown in Table 8, and in further detail, specifically of agricultural sciences and departments, as shown in Table 9. Graduates who sought work abroad or who took employment in jobs not related to agriculture were not included in the study.

1. Data collection method

The survey instrument consisted of a two-part questionnaire of 45 questions. This instrument
Table 6. Sampling of graduates population by current field distribution and graduation year.

<table>
<thead>
<tr>
<th>Graduation year</th>
<th>Teaching and Research</th>
<th>Agricultural production schemes</th>
<th>Specified agric. services Dept.</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1973/76</td>
<td>4</td>
<td>10</td>
<td>8</td>
<td>22</td>
</tr>
<tr>
<td>1976/77</td>
<td>2</td>
<td>10</td>
<td>11</td>
<td>23</td>
</tr>
<tr>
<td>1977/78</td>
<td>3</td>
<td>10</td>
<td>13</td>
<td>26</td>
</tr>
<tr>
<td>1978/79</td>
<td>1</td>
<td>6</td>
<td>16</td>
<td>26</td>
</tr>
<tr>
<td>1979/80</td>
<td>2</td>
<td>10</td>
<td>10</td>
<td>22</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>16</strong></td>
<td><strong>46</strong></td>
<td><strong>33</strong></td>
<td><strong>100</strong></td>
</tr>
</tbody>
</table>

**Source:**

1. Ministry of Agric. & Irrigation (Personal Office).

2. Different Agricultural Departments and Corporations.
was developed during a process which included intensive examination of curriculum committee deliberations of the faculty during the years 1970-1980, and informal dialogue with both staff members and past and present students of the faculty.

The questionnaire (represented in full in Appendix I) aimed to collect information in three major areas. Firstly, questions were posed on the current job situation of the graduates and work-related problems. Secondly, the questionnaire turned to graduates' attitudes and impressions of their training in the faculty including what they thought of the objectives, teaching methods, organization of the academic programme, and evaluation method used by the faculty.

The final major area attempted to have the graduates relate their current positions and performance on the job to the education they received in the faculty.

The questionnaire was administered by the principle investigator through visiting the six
major agricultural administrative centers of Sudan i.e. Khartoum, Vad Medani, Sennar, Kosti, Gedaref and Kassala. These towns, with their proximity to the major schemes, contain the greatest concentration of graduates of the faculty. Due to careful and sensitive administration of the questionnaire the researcher obtained 100 percent cooperation from the sample of 120 graduates.

Following the completion of the questionnaire by the graduates the forms were coded and the answers tabulated. From the aggregated information the analysis was derived and reported in Chapter 4.

Significance of Study
1. This study is conducted in the field of agricultural education, most important type of vocational education to Sudan, and in which few research work have been done. Information on evolution of this type of education, policies and institutions might be useful to educational planners.
2. The study deals with the Faculty of Agriculture, University of Khartoum, the pioneering and most important institution of agricultural education and training in the Sudan.

3. It is sincerely hoped that this study will contribute to the next phase of the development of the Faculty of Agriculture, since it reveals the strengths and weaknesses of the curriculum.

4. This study suggests specific reforms for the consideration by the Curriculum Committee and governing bodies of the Faculty.

5. This study helps the lecturers and instructors of the faculty in ascertaining the effectiveness of teaching.

6. It reveals points to be given particular attention in the post-graduation training, requirements and suitability.

7. It sheds some light on the agriculture job in Sudan and reviews the country's agricultural needs and its relevance to what was studied in the faculty.
CHAPTER 2
HISTORICAL BACKGROUND OF CURRICULUM DEVELOPMENT IN THE FACULTY OF AGRICULTURE, UNIVERSITY OF KHARTOUM

Examining the history of the Faculty of Agriculture, University of Khartoum and the curriculum background, is one of the objectives of this study. This chapter is an endeavour to update the information on the structure and functions of the Faculty. Moreover, it will attempt to highlight the advantageous proposals that were submitted, those pitfalls that were avoided, and those recommendations that were differed.

From this detailed examination of the developmental stages of the curriculum, in addition to the other objectives of this study, the process of curriculum assessment will be achieved.

2.1 Establishment of the Faculty of Agriculture and Its Development During the Pre-independence Stage (1928-1956)

The Faculty of Agriculture started as School of Agriculture in 1930, at Zaabak, a village situated about five miles from city of Khartoum. This school of Agriculture had been proposed earlier by J. N. Winter
director of education and M.A. Balloy, Head of Agricultural Research. The buildings were erected in 1937 at Gezira Research Park at Wad Medani, but were never occupied by the school. Chamber site, which is within easy access to the Gordon Memorial College at Khartoum, the precursor of the University of Khartoum, being wisely chosen. The school started with an entry of six students who were selected on completion of two year intermediate course in biology, physics and chemistry at the Gordon Memorial College. A three year course in agriculture, the agricultural science and agricultural engineering led to the award of the College diploma. The school graduated students in 1942.

In 1951, the Gordon Memorial College was transferred to the University College of Khartoum with special relationship with University of London. The School of Agriculture was then become a Faculty of Agriculture, offering in addition to the diploma, alternative courses leading to B.Sc. (Agrie.) degree of the University of London. Teaching for both
courses was identical, the difference being only in the standard. While entrants for the London Degree course required a pass in London Intermediate examination, admission to the diploma course was permitted on possession of the intermediate year certificate of the University College - a local examination. External examiners for the diploma were drawn from the Queen Ministry of Agriculture.

At that time the Faculty of Agriculture consisted of the following departments:

1. Agriculture
2. Agricultural Biology
3. Agricultural Chemistry and Pedology
4. Agricultural Organization (Rural Sociology)
5. Subdepartment of Agricultural Engineering (Mechanization and Irrigation)

In the early days of the school many of the entrants were drawn from urban communities with little or no agricultural background, so the importance of familiarizing the students with peasant farmer with whom he would eventually be working and
with the traditional methods and social life of 
the people was recognized from the start, and 
vocation trips and camps for students has always 
formed an essential part of the course. Pre-
breakfast field classes, in which the students 
cultivate their own plots, became familiar with 
agriculture implements (primitive and modern) and 
learn something of field biology, were means of 
overcoming this initial disadvantages.

In this context a big consideration had been 
given at that time to university experimental farm, 
the primary function of which, is to enable students 
to acquire practical skills in traditional and 
 improved methods of cultivation and serve as field 
laboratory of the Faculty. The experimental farm 
started with sixty acres of demonstration plots 
adjacent to the teaching laboratories, a small 
portion of this area had been reserved for the 
botanical museum. In 1932, the Sudan Government 
acquired 640 acres and leased this area to the 
University, Agricultural Faculty as a result of
strong recommendation by Principal J. Whitbeck, of 
Yye College, London in 1950. The installation of 
modern electrical pumping equipment in 1954/55 made 
it possible to irrigate most of the farm land. Farm 
buildings, cattle pens and well equipped dairy were 
erected in the same period. About two hundred 
acres were under crop during this stage. The main 
forage crops grown were lucerne, legumes from which 
eight cuts of high quality fodder were obtained 
annually, dura, maize, wheat, barley, cowpeas and 
haricot beans. Bananas, citrus and vegetables 
were grown as cash crops. A mixed dairy herd, 
predominantly of the Buitaas type, of 130 head had 
been built up as a result of long-term selection. 
All farming operations were, however, carefully 
costed separately. It was proposed eventually to 
set aside an area of about fifty acres to be run 
as an individual commercial unit.

2.2 The Faculty of Agriculture, Between (1955-1963)

In 1956 (Sudan independence year) the College 
of Agriculture acquired full university status.
The two courses were combined in the B.Sc.(Agric.) degree of the University of Khartoum, with entrance standards for the diploma and with examinations regulations more closely related to those of the college diploma than of the London degree. No relaxation of teaching and examination standards anticipated, and in the first year the University of London had generously agreed to provide external examiners for the Khartoum degree.

In 1963 the Faculty of Agriculture published a silver bulletin on the occasion of silver jubilee of the Faculty (1938-63). The Faculty of Agriculture developed in many aspects during the intervening years between the independence of Sudan (1956) and silver jubilee of the Faculty (1963).

During this period, the physical capacity of the faculty had been greatly increased by a building programme which cost about £50,000. Correspondingly there was an expansion in hostels taking place to accommodate all students. A generous grant of
In 1966 was donated by Barclays Bank to build a home sciences and community development department, for which the first intake was in 1966/67 academic year. The Home Sciences and Community Development Department continued for a few years and then ceased. The department buildings were used for other purposes by different departments. In addition, the Rockefeller and Ford Foundations had donated 170,000 U.S. dollars and 75,000 U.S. dollars, respectively, to cover the cost of research and improved teaching facilities in the Faculty. The reference library at Shanbat (which also serves the faculty of Veterinary Sciences) had increased almost two fold (between 1958-1963) in books and journals' accessions, houses about 25,000 volumes and more than 500 journals. This is apart from the considerable stocks, of the standard textbooks available in the department to be borrowed by the students. Recently, a new library building was erected with more capacity and services to serve the two faculties. Other faculty service facilities had been added since 1956, such as a plant environment.
control unit and a tropical shade house to create an agro-meteorological station which contains examples of virtually all the instruments available for recording soil and atmospheric climatology data, and photographic unit to initiate new approaches towards agricultural problem under dry lands and irrigated conditions.

Since that time there have been two farms with increasing demand for demonstration, experimental purposes and researches. The Faculty had become more conscious of its geographical location, in relation to the Sudan and Africa, and has led to concentrated efforts in researches and investigations on problems faced agriculture in the Sudan. Researches in the Faculty progressed in almost all agricultural disciplines, with perhaps greatest momentum on the production and protection of cotton, sorghum, millet, broad bean, winter vegetables, forage crops and citrus. Nutrition of poultry and large animals and their breeding and adaptability were being investigated.
Till (1964) the Faculty of Agriculture, University of Khartoum consisted of the following eight departments:

1. Agricultural Botany
2. Agricultural Engineering
3. Agronomy
4. Animal Production
5. Biochemistry and Soil Science
6. Crop Protection
7. Horticulture
8. Rural Economy

An option of Extension and Rural Sociology was added and cancelled during the early seventies, and instead a compulsory course was offered in the final year. In 1976 a Department of Forestry was established in the old building of the library.

The total number of undergraduate students in 1964/65 was 139 compared with only 39 students in 1956, compared to nearly 1000 students in the late seventies. Another thing to be mentioned is the increase of girl students, reaching half of the total number currently
compared to only six girl-students in 1965.
Correspondingly new hostels to accommodate girl-
students were erected at Dhabat in 1982 and a
considerable change in students' social life was
created by the effect of this change.

2.3 Implementation of the Option System

In 1963, the structure of the undergraduate
courses had undergone far-reaching changes. It
was thought that a major fault of the general
degree system was that it tried to cover a wide
range throughout and in a continuously expanding
array of disciplines and as a result, the students
became bored and bogged down, and often lost
interest that might originally have sparked their
imagination towards agriculture. That system was
remodelled to involve one year in the Faculty of
Science and four years in the Faculty of Agriculture.
The first three years were devoted to basic and
general topics and the final year was left for some
degree of specialization. The design of the degree
had been found most appropriate in light of the requirements of a developing society, and based on a combination of selected courses in the final year with a choice of disciplines as the main option, but with four additional supporting courses from other departments. The complement of these supporting courses in the formal time table hours was the same for the main option, namely, eight hours in total, but the student is expected in addition to submit a short dissertation in a subject of his choice.

By application of this structure, the Faculty achieved a higher plateau in the intellectual and academic activities than at the general degree level. The "group specialization" design of the courses helps not only to bring the teaching staff of each department closer together for purposes of coordination (such as seminars and study groups), but also strengthens the links within and between departments to a much greater extent to think, read and enjoy their respective subjects.
In order to graduate students with a measure of competence in one of the many branches in the agricultural sciences, there was obviously the possibility of recommending a single-discipline specialization in the final year, thus offering a "special" degree following the pattern of the University of London. This avenue was explored, but the academic hazards involved (not to mention the financial implication) became abundantly clear and single-subject specialization has been left, as in the past, to the post-graduate level.

2.4 Evolving Objectives of the Faculty

Actually it is well known that any instructional programme or any educational school or college must be based on a definite and clear objectives extracted from the educational philosophy of a particular country. These objectives are supposedly influenced by needs, attitudes and interests of the students. Since these factors are changeable, the objectives must be changed
accordingly and consequently the structure and content of the educational programme must be subject to a continuous process of change and modification.

The first formation of the Faculty of Agriculture was the School of Agriculture in 1938. The main objective of the school was "to provide professional training for the agriculture officials required by the Sudan Ministry of Agriculture". The School of Agriculture continued with these objectives during the forties and perhaps until the fifties as long as the Ministry of Agriculture concentrated its then limited efforts on the production side with heavy leaning on the practical aspects of crop and animal production. The future prospects of the graduates by then were limited to the assistant agricultural inspector ladder.

In 1951 the School of Agriculture emerged into a College of Agriculture belonging to the University College of Khartoum, and later transformed into the
Faculty of Agriculture with full university status in 1956. The instructional content in the School, and College of Agriculture had been changed according to the modifications occurred in the objectives. The syllabus had been slightly modified in attempt to meet the requirements of Sudan for both agricultural officials and research workers and at the same time to provide a first degree which will be acceptable to overseas universities as a basis for post-graduate training.

The needs of the country for agricultural training after independence were not satisfied by the generalized sort of agriculturist, who played an honorable role in agricultural development by virtue of his versatility and reliability in practical aspects of production. Beside the "all-round" agriculturist some degree of specialization was imperative at the B.Sc. level so that such graduates could promote their specialization studies to post-graduate levels in order to shoulder research responsibilities.
in the intervening years between the early
sixties until the early seventies and perhaps
until the present day, the country demands the
"production specialist" as well as a narrow special-
ization in certain subjects to meet the require-
ments of research. The justification for this
being the continuous expansion in agricultural
schemes both irrigated and rainfed, and those
require large number of "production specialists"
and reinforcement of the existing research stations
by specialized personal to handle the increased
size of research problems. Furthermore, new
research stations would have to be opened to
sponsor research of the new environments created
by expansion.

According to these profound changes in the
country agricultural needs, the objectives of the
Faculty changed after the independence in such a
way as to attempt to produce young men and women
who are:
1. Adequately aware of the underlying scientific and social principles governing agriculture.

2. With a good measure of competence in their grasp of the principles and practices of crop and animal production.

3. Developing special interest in one agricultural science, though by no means exclusively specializing in it.17

Thus the Faculty avoided exclusive specialization even in the final year, unlike many faculties of agriculture in other countries, where the last year or even two years are directed to one discipline only. Presumably this reflects the needs of those countries for specialist graduates from the first degree, but as has been assessed at that time, the Sudan and other developing countries would continue to need graduates in agriculture with a fairly broad background. The country needs in the present day, actually require to be assessed
and the existing objectives need to be examined accordingly, to evaluate the educational content both in respect of learning experiences and the organization of those learning experiences practiced in the Faculty of Agriculture.

It is important to mention here that in 1972, there was an endeavour for formulating new objectives. The attempt led to many proposals for new organizational structure and curriculum in the Faculty. Many staff members had discussed this issue under what was called, need for re-examination of the objectives and structure of the B.Sc. and M.Sc. degrees in the Faculty of Agriculture. Some of the factors that contributed to reconsideration or review of the objectives were as follows:

- The annual intake in the Faculty of Agriculture jumped from less than 100 students in the late sixties to about 250 students currently.
- The last few years also witnessed a steady rise in number of applicants for post-graduate training
especially after the Ministry of Planning decided not to consider any applications for high studies abroad in the field of agriculture unless it is accompanied by an official letter from the Faculty of Agriculture indicating that the study can not be offered locally.

- The resources (staff and facilities) available to Faculty are not keeping pace with the increase in student enrollment.

For the above mentioned factors some of the staff members called for re-examination of the objectives, structure, and course contents of the Faculty degree, in order to maximize the efficient utilization of the Faculty's limited resources, and to ensure that the graduates will best fit the national demands and will have a real impact on agricultural development in the country. A series of Heads of Departments meetings were held to discuss the proposed modifications in the curriculum's structure and content on the basis of new objectives which were given by some of the staff members, namely Dr. Ali E. Koubal and Dr. M.S. Bayoumi.
The meeting of Heads of Departments came out with several alternatives for the existing B.Sc. structure. These alternatives can be summarized as follows:

1. **All students graduate as B.Sc. honours without specialization, i.e. a reversion to the situation prior to 1967.**

2. **To award a B.Sc. general agriculture after the first three years following the preliminary and to retain the outstanding students for another year to specialize more narrowly.**

3. **The third alternative aims to classify students after the first three years into two groups:**
   - The best students, defined by the attainment of a certain high level, which will be permitted to pursue specialization courses in the fourth year to meet the requirement of research.
   - The majority of the students to be advised to take courses tailored to produce specialists in production and management aspects.
The general feeling of Heads of Departments was for this last proposal since it appears to be the best under the present circumstances, but none of these proposals was adopted or introduced in the Faculty.

The degree structure postulated in 1964 still continues based on the objectives given by Professor M.A. Neuf, Dean, Faculty at that time. Only those objectives will be considered since they are the current objectives of the Faculty and accordingly will be subject for evaluation in the following chapters.

2.5 Assessment

The year 1967 was surely considered as a prominent landmark in the history of the Faculty of Agriculture, since it witnessed the introduction of the B.Sc. hons. in agriculture with a new type of assessment.

The assessment of the degree of the Faculty, prior to 1967 was not based on a definite system, so many difficulties were experienced by the examiners in the assessment of the students' performance. Example of this, that the examiners meeting in March 1967 took
three hours to look into the results for Parts I, II, III and more even five hours to classify final year students. The general feeling of the examiners was that a system must be worked out to simplify the assessment procedure.

At its 69th meeting, held on 19th March 1967 (Minute 304), the Faculty Board decided that a committee be formed to study the criteria for classifying B.Sc. (Agric.) Honours degrees into the different divisions. The committee composed of representative of each department and the secretary of the Faculty Board acted as its secretary. The committee made a full study of the examination systems in other faculties, institutes in the country and in Africa, in universities of England and United States of America. Eventually the committee came out with the following recommendations, which were approved by the Faculty Board and were applied since then up to date.

1. The performance in the four years should be considered in assessing the B.Sc. (Agric.) degree.
2. The performance over the first three years should be pooled and given a fixed percentage of the total achievement. This ensures fairness of consideration to all subjects. With regard to the percentage given to the first three years, the Faculty decided to give 60% for the first year and only 40% for the first three years.

3. The passmark should remain 50%.

4. The computer analysis should be stopped at the stage of computing the percentage for each student.

The computer trials

In his report on the 1966/67 examinations (73rd meeting of the Faculty Board), Dr. A.R. Reece suggested a formula for assessing students' performance. He produced a single number M (Maximum 100) which is to be presented to the examiners meeting. This formula formed the framework for the trials with the computer since 1967 and till now.
The committee had produced a working programme for
the computer. This programme was based on the following:

1. The standard deviation was introduced to match
the different styles of marking.

2. The marks obtained in the examinations are
changed to points as follows:
   a) Less than the passmark (50%), the student
      gets one point.
   b) Between the passmark and the class average
      (provided that the average is more than
      50%), the student gets two points, but if
      the class average is less than 50%, a
      student gets only one point because of his
      failure to attain the pass mark.
   c) The class average is 5.5. If the class
      average is 50% or more, the student gets
      3 points. If the class average is less
      than 50%, then 50% + 3.5 is given 3 points.
   d) The class average (or the passmark if the
      class average is below the 50% mark) plus
      more than one 8.5, the student gets 4 points.
3. The maximum number of attainable points is 4 by the number of subjects (i.e., 4x, 4y, 4z) where x, y, z, x = 1 and 2 are the number of subjects in 1st, 2nd, 3rd and 4th year respectively.

4. Differential weight was given to the contribution of each academic year in determining the final grade:

   - 10% of 1st year total
   - 15% of 2nd year total
   - 25% of 3rd year total
   - 50% of 4th year total

The maximum attainable (i.e., the full mark) thus becomes \( \left( \frac{10}{100} \times 4x \right) + \left( \frac{15}{100} \times 4y \right) + \left( \frac{25}{100} \times 4z \right) \)

Later on, the examination committee raised two points to be considered in the existing point system.

a) It is realized that the range between the pass mark and the class average is often large enough to warrant a credit for student who scores the average mark of the class or close to it.
5) Students who obtain marks higher than the value (class average +1 S.D) in the present system all obtain 4 points in the maximum attainable. Large differences exist within this group.

The examination committee introduced the following modification to cater for the two above mentioned points.

Thus the previous system:

\[ 1 \text{ pt} \rightarrow 30 \rightarrow 2 \text{ pt} \rightarrow \text{class} \rightarrow 3 \text{ pt} \rightarrow 4 \text{ pt} \rightarrow \text{average} \]

The modified system:

\[ 1 \text{ pt} \rightarrow 50 \rightarrow 2 \text{ pt} \rightarrow 3 \text{ pt} \rightarrow 4 \text{ pt} \rightarrow 5 \text{ pt} \rightarrow 6 \text{ pt} \rightarrow \text{average} \]

\[ 1 \text{ pt} \rightarrow 50 \rightarrow 2 \text{ pt} \rightarrow 3 \text{ pt} \rightarrow 4 \text{ pt} \rightarrow 5 \text{ pt} \rightarrow 6 \text{ pt} \rightarrow \text{average} \]

\[ \frac{1}{2} \text{ (half the difference between 50 and class average)} \]

6. The division was determined according to the cumulative number of points over the four years of study expressed as a percentage of maximum attainable as in the above formula.
75% or more of the maximum attainable gets division I
55% and less than 75% gets Upper II
55% and less than 65% gets Lower II
Less than 55% gets division III

The Dissertation Assessment

Prior to 1972 the faculty practiced the dissertation as assessment procedure. Each final student was required to submit a dissertation in his respective line of training and it was considered as a requirement for the award of the B.Sc. (Agric.) Honours. By the advent of the large number of students admitted to the first year in the faculty in July 1969 (92 students) and the subsequent intake of (149) students in July 1970, in addition to the proposed even larger classes, in the order of 250 to 300 students, in the immediately following years, new ideas emerged. It was found that the teaching staff could not undertake the supervision of the honour students dissertations and if the staff carried out this responsibility, the consequences would be adverse in training post-graduates and, even more
dangerous, the personal research of the academic
members of staff would be handicapped.

For all these reasons the dissertation had been
cancelled in 1972 as a requirement for award of the
3.50 (Agrie.) Honour degree and replaced by the full
use of the practical hours in each course.

2.6 Adoption of the Semester and Course Unit System

The University of Khartoum Senate, in its 14th
meeting held on March 4th 1976 vide minute 5630,
accepted the recommendations of the Committee on
Academic Reform (CAR) with regard to:

1. Adoption of an academic year of two semesters.

2. Introduction of the course unit system based
   on thorough revision of curricula for relevance
   and professional competence.

3. Stimulation of inter-disciplinary studies
   where an increased number of degree relevant
   to the needs of society is required.

The Senate also resolved that this matter should
be referred to Faculty Boards to express their views.
as to what steps should be taken towards implementing these recommendations which have been accepted by the Senate. The Faculty Board in the Faculty of Agriculture decided to implement the semester system in the same year (1975) and no problems faced the Faculty in applying this system because of some previous practices.

The semester system

According to the option system followed in the final year of B.Sc. (Agric.) Honors degree (since 1965), the courses offered were arranged on half academic year basis and the examinations were held at the end of each semester while in Parts I, II, III the subjects remained as they were, i.e. each subject runs for the whole year and is therefore examined once at the end of the academic year. In order to relieve some of the tension of the final examinations and to urge the students to study more evenly during the academic session, a system of mid-sessional examinations that carry 25% of the final grade was introduced in Parts I, II and III in 1975. This has proved to be very effective. In addition, the Faculty experience with the final year courses
over the last ten years has shown that the semester followed in Part IV is advantageous for both students and staff. The examination results in the final year have improved substantially and at the same time it was easier for the academic staff to arrange their time between teaching, research and other commitments. Another advantage is that it has eased the tension of the final examinations since about half of the final examinations are held in December and the rest in March.

In view of all previous mentioned experiences the faculty came to a full application of the semester system in 1976 according to the Senate recommendations with much less difficulties compared to other faculties in the University of Khartoum. The contents of all the subjects were revised and some of them were divided into two halves to be offered and examined independently at the end of each semester. The new set of subjects were given numbers (codes) according to the year and semester in which they are offered, i.e. Agricultural Botany 11 and 12 indicates that it is
offered in Part I during the first and second semester, respectively.

The examination regulations were revised accordingly:

1. Each semester examination results be considered independently and announced at the end of each semester.

2. The passmark for each subject is 50.

3. Examinations within the semester could continue according to the previous regulations. However, examiners should be requested to conduct oral examinations for cases in the range of 55-49 degrees before the submission of results.

4. Supplementary examinations for both semesters be held at the same time, i.e., before the next academic year.

5. Examination results be processed according to the number of subjects offered in the semester as follows:

   a) Pass all subjects in the semester consider pass.
b) Failure in one subject, offered supplementary.

c) Failure in two subjects offered supplementary except in Part I, second semester (4 subjects only) where considered to repeat the semester.

d) Three failure considered to repeat the semester there in second semester Part I will be dismissed.

e) Four and more than four subjects (5-6) will be dismissed. Except in Parts II and IIT for both semesters (5 subjects) where considered to repeat the semester.

A candidate is allowed supplementary of 30% of all the subjects (3 supplementary subjects in most semesters). A candidate who fails one examination in the first semester is allowed two supplementaries in the second semester. A candidate who fails two subjects in the first semester is allowed only one supplementary in the second semester. A candidate who fails two subjects in both semesters repeats the year.
The course unit system

It is worth to mention that the semester system as currently implemented in different faculties of the University of Khartoum, is not the course unit system which the University is aspiring to adopt in the near future, but it is a definitely a step in the right direction. Under the course unit system each course is assigned a number of "units" according to the time spent in studying it. The requirements for a degree are set in terms of "course units" and not as number of years. There are no supplementary examinations and no student is allowed to repeat a course which he has already passed. However, a student is expected to repeat a required course which he fails to pass in the first time and if he does not maintain a certain overall academic standard he may be asked to leave the University. Examinations are viewed not only as a measuring device, but also as a teaching aid. Thus several tests are given during the semester and a system of continuous evaluation is followed. Under such system it is very difficult to make use of external
examiners and most of the evaluation of a student's performance has to be made by his teacher. The system is flexible for it allows students to proceed at different paces, to change their fields of study without losing much and it permits introduction of new degrees or courses.

In the Faculty of Agriculture, the Faculty Board in its meeting on 14th August 1976, while minute 247, decided to impose the course unit system on the present semester system. The Curriculum Committee in the Faculty strongly recommends immediate but gradual adoption of the course unit system by temporarily imposing it on the present course structure.

The proposal of the Curriculum Committee is to start with the first year since it would be difficult to apply it to other classes. Meanwhile each department should lay down courses which would lead to degrees in the various disciplines. The Faculty of Agriculture till the present day has not come to the application of the course unit system and not even the transitional stage which was proposed by the Curriculum Committee.
Many general and technical problems faced the Faculty in the implementation of the course unit system. In general terms, the course unit system raises the question as to whether the country is ready for specialized agriculture graduates, as the system inevitably leads to specialized degrees. This question, as was felt, would have to be jointly tackled by the Faculty, Ministry of Agriculture and Ministry of National Planning. However, it was noted that the country's need for specialized agriculturists is expected to increase due to increased intensification of production.

The technical problems associated with the implementation of the course unit system is that the system involves a lot of records keeping, so an office to handle these records is required and it is essential to train the necessary staff to shoulder this responsibility. This system also needs a formulation of new rules and regulations governing the degree structure, graduation requirements, and examination regulations, in addition to the essential improvement of existing
facilities especially with regard to classrooms, library and teaching aids. Shortage of staff is also considered as a problem in the Faculty of Agriculture, but an efficient utilization of the present staff through better design of the time-table was proposed to give a partial solution of this problem. However, it was recognized that more staff would be the ultimate answer.

2.7 Course Content and Organization During the Different Developmental Stages of the Faculty

I) Degree structure prior to 1963

Two years in the Faculty of Science

Three years in the Faculty of Agriculture

Preliminary year

Chemistry (5 hours lecture + 3 hours practical/week)

Botany (2 hours lectures + 4 hours practical/week)

Physics (4 hours lecture + 4 hours practical/week)

Zoology (4 hours lecture + 3 hours practical/week)

Intermediate year

Botany (4 hours lecture + 6 hours practical/week)

Chemistry (4 hours lecture + 6 hours practical/week)

Zoology (3 hours lecture + 6 hours practical/week)
First Year  Faculty of Agriculture
Agricultural Biochemistry I
Agricultural Botany I
Agricultural Engineering
Introduction to Agriculture
Soil Science I

Second Year
Agricultural Biochemistry II
Agricultural Botany II
Crop Production and Farm Mechanization
Economics of Agricultural Production
Entomology
Soil Science II

Third Year
Agricultural Organization
Animal Husbandry
Animal Production
Crop Production I
Crop Production II
Crop Protection
II) A.Sc. (Agric.) Honours - since 1963 up to 1975
preliminary year

Botany
Chemistry
Physics
Zoology

Math. (2 hours lecture/week)
Scientific English (3 hours lecture/week)

First year Faculty of Agriculture

Agric. Botany I (3 hours lecture + 4 hours practical/week).
Agric. Zoology (4 hours lecture + 4 hours practical/week).
General Chemistry and Geology (4 hours lecture + 6 hours practical/week).
General Agriculture (3 hours lecture + 2 hours practical/week).
Math. and Statistics (2 hours lecture).

Second year

Agric. Biochemistry (3 hours lecture + 3 hours practical/week).
Agric. Botany II (2 hours lecture + 2 hours practical/week).
Agric. Engineering (4 hours/week for two terms)
Crop Production I (3 hours/week).
Animal Production I (2 hours/week).
Principles of Economics (2 lectures + 1 hour seminar/week for two terms)
Entomology (1 hour lecture + 2 hours practical)
Soil Science (3 hours lecture + 3 hours practical/week).

Third Year
Introduction to Agricultural Economics (2 hours lecture + 1 hour seminar/week)
Agricultural Engineering II (4 hours/week for two terms)
Animal Production II (4 hours/week)
Crop Production (2 hours lecture + 4 hours practical)
Horticulture (4 hours/week)
Crop Production II (3 hours lecture + 2 hours practical/week)
Field Experimentation (2 hours lecture/week for half a year, non-examinable)
Some modifications had been proposed in the content and organization of the courses in 3rd year in 1972 and were approved:

1. The Agricultural Engineering courses run for a full academic year.
2. Field Experimentation courses offered as non-examinable subject transformed to final year as a compulsory half year course (Statistics and Experimental Design).
3. The Crop Production II courses became 2-3 hours/week, Genetics and Plant Breeding had been added in 2 hours per week, i.e. there was an increase of one hour/week to cater for Genetics part.

Fourth year
Students choose one of the following eight options:

1. Agricultural Economics
2. Agricultural Mechanization
3. Animal Production
4. Biochemistry
5. Crop Protection
6. Horticulture
7. Farm Management and Extension (replaced by Soil Science 1972)
8. Crop Production

In all options, except Crop Production, students take a major course (4 hours per week throughout an academic year) and two supporting courses (each 4 hours per week for half an academic year); these are offered by the department sponsoring the option. In addition, students of each option are required to take 4 compulsory supporting courses from different departments in the Faculty. These courses are:

1. Agricultural Education and Rural Sociology
2. Farm Management
3. Land Use
4. Biometrics and Experimental Design

The Crop Production option consists of six supporting courses. Students are required to take (4–6) of these courses plus (2–4) supporting courses from other departments to complete a total of eight courses.
### Subjects

<table>
<thead>
<tr>
<th>First Semester</th>
<th>Second Semester</th>
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<tr>
<td></td>
<td>Code No. of Units</td>
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<td></td>
<td>hrs.</td>
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<td><strong>PART I</strong></td>
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<td>1. Agric. Botany</td>
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<tr>
<td>2. Agric. Zoology</td>
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<td>3. Crop Production</td>
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</tr>
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<td>4. General Chemistry &amp; Geology</td>
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<td>5. Introduction to Agric.</td>
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<td>6. Math. &amp; Statistics</td>
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<tr>
<td>7. Plant Physiology</td>
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<td><strong>Total</strong></td>
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<tr>
<td>2. Microbiology</td>
<td>21 2+2</td>
</tr>
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<td>3. Agric. Engineering</td>
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<tr>
<td>4. Animal Production</td>
<td>-</td>
</tr>
<tr>
<td>5. Crop Production</td>
<td>-</td>
</tr>
<tr>
<td>6. General Entomology</td>
<td>21 3+4</td>
</tr>
<tr>
<td>7. Principles of Economics</td>
<td>21 5</td>
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<td>8. Horticulture</td>
<td>-</td>
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<td>9. Soil Science</td>
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<td><strong>Total</strong></td>
<td>17+14=31</td>
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<tr>
<td><strong>Total</strong></td>
<td>31</td>
</tr>
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</table>
CHAPTER 3
LITERATURE REVIEW

The major problems of human resources development fall into two broad categories: (1) those related to shortage of "high-level" man-power with critical skills and competence and (2) those related to redundant or underutilized man-power. Thus human resource development is concerned with the two fold objectives of building knowledge and skills (essentially the development of man's brainpower). The objective of strategy of human resource development is to build the skills and knowledge required for economic, social, cultural and political growth and to provide avenues of participation in the creation of better society for all who seek them. Harrison and Myers added "human resource are developed in many ways. The most obvious is by formal education, beginning with primary or first-level education, continuing with various forms of secondary education, and then higher education including the colleges, universities, and higher technical".

Vocational education is an important type of education as it contributes to the economical and
agricultural development in Sudan. It is defined as
"technical training or re-training which is given in
schools or classes (including field or laboratory work
and remedial or related academic and technical incident
thereto) under public supervision and control or under
contract with a state board or local educational
agency, and is conducted as a part of program designed
to prepare individuals for gainful employment as semi-
skilled or skilled workers or technicians or sub-
professionals in recognized occupations and in new and
emerging occupations, or to prepare individuals for
enrollment in advanced technical education program,
but excluding any program to prepare individuals for
employment in occupations generally considered profes-
sional or which require a baccalaureate or higher
degree".22

If we review vocational education as a link between
man and his work it becomes important that the instruc-
tional contents of vocational education program be
assessed now and then to determine their efficiency
in equipping individuals to fit in the world of work.
The contents of any particular vocational curriculum are determined by the requirements of that occupation. "It is efficient to the degree it does what it sets out to do; it is effective to the degree it sets out to do those things most related to the job or vocation to be taught." 11

Curriculum

The term curriculum as interpreted by Beauchamp could be defined as "a written document which may contain many ingredients, but basically it is a plan for the education of pupils during their enrollment in a given school. It is the overall plan that is intended to be used by teachers as a point of departure for developing teaching strategies to be used with specific classroom groups of pupils". Wenrich defines it as "the entire spectrum of educational experiences made available to students through a given institution. The curriculum is made up of many programs, and each program consists of an aggregate of courses". Thompson indicates his definition of term curriculum as that which concerns itself with objectives, content, and methodology.
and is planned to lead to the students' growth and development. So a program with all its contents, methodology and objectives is a curriculum.

Tyler views the instructional program as a functioning instrument of education. He sets certain principles of developing any curriculum and plan of instruction and these principles are:

1. What educational purposes should the school seek to attain?
2. What educational experiences can be provided that are likely to attain these purposes?
3. How can these educational experiences be effectively organized?
4. How can we determine that these purposes are being attained?

Tyler indicates educational objectives are criteria by which materials are selected, content is outlined, instructional procedures are developed and tests and examinations are prepared. He adds, education is a process of changing the behavior patterns of people.
Thus he uses behaviour in the broad sense to include thinking and feeling as well as overt action. When education is viewed in this way, it is clear that educational objectives then, represent the kinds of changes in behaviour that an educational institution seeks to bring about in its students, so he believes that study of learners themselves would seek to identify needed changes in behaviour patterns, which include in this term investigation of needs, interests and attitudes of students. Tyler defines the term need as “the gap between what is and what should be.” Another use of the term by some psychologists represents tensions in the organism which must be brought into equilibrium for a normal healthy condition of the organism to be maintained. He adds: “Prescott classifies needs into three types: physical needs such as the need for food, for water, for activity, for sex and the like; social needs such as the need for affection, for belonging, for status or respect from this social group; and integrative needs, the need to relate one’s self to something larger and beyond one’s self, that is,
the need for a philosophy of life. Studies that identify the educational needs are necessary studies to provide a basis for the selection of objectives which should be given primary emphasis in the school’s program. Most of these studies will have two parts, first, finding the present status of the students, and second, comparing this status to acceptable norms in order to identify the gaps or needs.

Second type of study of the learner, which demands particular consideration, is the investigation of students’ interest. It is supposed that, if school situation deals with matters of interest to the learner, he will actively participate in them and thus learn to deal effectively with those situations. Furthermore, it is argued that the increasing effectiveness with which he handles present situations guarantees his ability to meet new situations as they arise.

Third thing to be considered concerning study of learners, as educational objectives resource is the attitudes of students. Attitude about something usu
been defined by Newcomb as "a persistent state of readiness to perceive, to perform, to think and to feel about something in such interdependent ways as to lead to certain kinds of goals". In vocational agriculture and rural development, attitudes of both change agents and of those to whose benefit the change effort is designed, are very important factors. Mosher indicates that attitudes of the urban elite with respect to the rural people and rural development is a far greater obstacle to agricultural and rural development than the attitudes and values of the rural people themselves. We summarized his ideas in a list of questions that need to be answered by research and which are well focusing on whether or not the urban elite believe in the possibility and desirability of rural development. Sudan is among the countries of low-income that developmental agencies rely on urban elite for rural development. The graduates of the Faculty of Agriculture, on whom this study was conducted are among the urban elite to be involved in rural development. Their attitudes towards certain aspects
of the rural life, towards their jobs and responsibilities and their commitment to the profession determine their success or failure. Phipps outlined some criteria to indicate the degree of commitment to one's job:

1. To be a believer in the progress and have the initiative to carry it out.
2. To be willing to dedicate himself to his job and render efficient service.
3. To be of preservation because success can not be attained overnight.
4. To have faith in the work and the enthusiasm and courage to continue with it even though at times things do not appear the brightest.

Barnagna related the philosophy of students in obtaining university education (agricultural training) to the above mentioned criteria as follows:

1. They wanted prestige and authority
2. They wanted good payment and better living
3. They wanted to develop the country
4. They wanted intellectual knowledge.
Formulating Educational Objectives

The most common and simplest way of grouping objectives is in terms of "knowledge", "skills" and "attitudes". Objectives should be written in the simplest way possible, consistent with the purposes for which they are being used.

Mager and Ranch give five characteristics in formulating objectives:

1. An objective says something about the student, it does not describe the textbook, the instructor, or the kind of classroom experience to which the student will be exposed.

2. An objective talks about the behaviour or performance of students. It does not describe the performance of the teacher, nor does it describe what the student is expected to know or understand.

3. An objective is about ends rather than means. It describes a product rather than a process.

4. An objective describes the conditions under which the student will be performing his terminal behaviour.
5. An instructional objective also includes information about the level of performance that will be considered acceptable.

Teaching and Learning Experience

Teaching is the facilitation of learning. Teaching is warranted to the extent that it causes learning to be more effectively achieved than would have been the case in the absence of instruction. In other words, the main justification for the existence of instruction is that it assists an individual to learn something better than he would be himself. It is a burden of instructors to demonstrate the value of their efforts by demonstrating their ability to facilitate the process of learning.

Tyler defines the term learning experience as "the interaction between the learner and the external conditions in the environment to which he can react". He adds "this definition of experience as involving the interaction of the student and his environment implies that the student is an active participant, that some features of his environment attract his attention and it is to these that he resists. The question may be raised
as to how far it is possible for a teacher to provide an educational experience for a student since the student himself must carry on the action which is basic to the experience. The teacher can provide an educational experience through setting up an environment and structuring the situation so as to stimulate the desired type of reaction. Such effort of the teacher is what is known as the effectiveness of the teaching methods.

Reilly\textsuperscript{21} expresses his view on lecture as a common teaching method as follows: "Lecture and associated methods of teaching are widely practiced. They provide the easiest and usually the cheapest means of transmitting information from the expert to a large number of trainees. Even the trainers who decry the lecture method in theory often use it themselves in practice. If well done, that is, if the lecturer knows his subject, stimulates his audience, perhaps through the use of examples, humour, visual aids, and a projection of his personality, and ensures that he is speaking at a speed and level that can be understood, the lecture is not to be disparaged. But there are many do's and not's
relating to the lecture which are too often ignored and result in hours of boredom and little effective training. For the mature student, the occasional use of the lecture may be valid but on the whole it is to be avoided.

Learning in small groups is a traditional and essential part of the experience of higher education whether it occurs in the tutorial, the seminar, the laboratory or as part of a project. Their aims or purposes will depend upon a number of factors which go beyond the more traditional concern for cognitive understanding and include developing oral skills, providing opportunities for self-expression, giving staff feedback on how students respond to ideas, developing self-awareness and the ability to work independently yet cooperatively in a team, developing a sense of social identity, and a feeling of belonging and commitment. Using, in other words, the forces of social relation to generate the desire of learn. 20

Field work can add to the variety, interest, and balance of a training program and for this reason alone
is worth considering. It provides an opportunity for the trainees to get a break from the classroom, to relate the theory taught in their course to what happens in practice, and to hear a variety of opinions from the people they meet in the field which can help to put what they learn in class into a more realistic perspective.

Criteria for Effective Organization

In order for educational experiences to produce accumulative effect, they must be so organized as to reinforce each other, organization is thus seen as an important problem in curriculum development because it greatly influences the efficiency of instruction and the degree to which educational changes are brought about in the learners. Tyler indicates three major criteria to be met in building an effectively organized group of learning experiences. These are: continuity, sequence, and integration. Continuity refers to the vertical reiteration of major curriculum elements. Sequence is related to continuity but goes beyond it. It is possible for major curriculum elements to recur
again and again but merely at the same level so that there is no progressive development of understanding or skill or attitude or some other factor. Sequence as a criterion emphasizes the importance of having each successive experience build upon the preceding one but to go more broadly and deeply into the matters involved. Mager and Beach\textsuperscript{11} provide six guides to effective sequencing of instructional material.

1. From general to specific. Students mean something different than instructors when they agree they would like instruction to proceed from the "simple to the complex".

2. Interest sequencing. To maintain the motivation of the student, start with a unit that contains information in which he is highly interested at beginning of the course.

3. Logical sequencing, refers to the necessity of teaching one thing before another.

4. Skill sequencing.

5. Frequency sequencing, refers to teaching skills which most frequently used on the job, followed
by the rest of teaching units, in order of
decreasing usefulness or importance.

6. Total job practice. It is a matter of providing student an opportunity to practice the
entire job as much as he needs practice in the
bits and pieces of the job.

Integration is the third element contributed to
the effective organization of learning experiences, it
refers to the horizontal relationship of curriculum
experiences. The organization of these experiences
should be such that they help the student increasingly
to get a unified view and to unify his behaviour in
relation to the elements dealt with.

Evaluation

The process of evaluation, as Tyler states, is
essentially the process of determining to what extent
the educational objectives are actually being realized
by the program of curriculum and instruction, in other
words it is a process for determining the degree to
which changes in behaviour are actually taking place.
This process involves two aspects. One is appraisal of the behaviour of students and the second is involving more than a single appraisal at any one time to see whether changes have taken place. This second aspect implies that it is necessary to make an appraisal at later points to identify changes that may be occurring. Appraisals at the start and the end of the program are not enough because some of the objectives aimed at may be acquired during an educational program and then rapidly dissipated or forgotten. In order to have some estimate of the permanence of the learning, it is necessary to have still another point of evaluation which is made some time after the instruction has been completed. Hence a follow-up study for graduates is important to get further evidence as to the permanence or impermanence of the learning which has been acquired during school time. One important step in evaluation is the definition of objectives and the second is to identify the situations which will give the student the chance to express the behaviour that is implied by the educational objectives. The principle that guides the second factor is that any
evaluation situation is the kind of situation that gives an opportunity for the students to express the type of behaviour to be appraised. In other words the ideal situation is appraising the students while they are on their jobs.

"When we speak of the evaluation of teaching in higher education there are at least three areas of major concern: the assessment of lectures; research into different teaching methods; and the evaluation of courses or educational systems."

The University Teaching Methods Unit (UTMU), in the context of evaluation methods, adds "there are two main areas of evaluation requiring very different methods. One would be concerned with the process looking at the reactions to the teaching-learning situation from the point of view of participants or observers. The other would be concerned with the outcomes measuring the changes which have occurred amongst the students attending the course."
CHAPTER 4

DESCRIPTIVE ANALYSIS OF DATA

This study was concerned with the instructional content of the curriculum of the Faculty of Agriculture, University of Khartoum. It tried to show its advantages and disadvantages through a follow-up study of the graduates of this faculty. The responses of the graduates were meant to shed some light on the post-graduation experience of respondents and the effect of their studies on their careers.

Ten areas were selected to be covered by the respondents' answers. These areas were:

I. Graduates' experience

II. Graduates' satisfaction with the B.Sc. programme in terms of its relevance to their jobs description.

III. Graduates' needs, interests and the reasons behind their matriculation in the Faculty of Agriculture.

IV. Graduates' attitude towards the selection system of the Faculty of Agriculture and the English language as a medium of instruction.
V. The effectiveness of the teaching methods.

VI. Sufficiency of courses for students' qualifications.

VII. Graduates' attitudes towards implementation of the option system in the faculty.

VIII. Graduates' impressions about instructors and teaching facilities.

IX. The assessment of students' performance as seen by graduates.

X. General views about life in the Faculty of Agriculture.

4. Graduates' Experience

This was the largest area in the survey. A considerable portion of the questionnaire was made to explain some different aspects of the post-graduate experience of the respondents. The aspects which included in this area were as follows:

1. Current and preferred sites of graduates.

2. Social values learned by the faculty graduates.

5. Problems faced by the graduates.

5. Post-graduation training.

1. Current and preferred sites of graduates

Three questions dealt with this aspect of post-graduation experience. The first question classified the respondents according to their job sites. The second question determined the preferred job site by the graduate and its difference with the actual job site. The last question concerned with the influence of the faculty site, being located in an urban area, on the graduates stated preference.

Considering the first question, 43 respondents (35.83 percent) indicated that they worked in rural areas. 25 respondents (20.33 percent) worked in urban areas and 49 respondents (40.83 percent) described their job sites as urban areas but with some official visits to rural areas. With regard to the second question, the number of graduates who preferred to work at urban areas is 32 respondents (26.66 percent), whereas 20 respondents (15.00 percent) preferred to work at rural areas, and 53 respondents (42.33 percent)
preferred to have their work at urban areas with regular official visits to the rural areas. Table 10 shows the graduates' responses to the first and second questions.

Table 11 indicates the differences between the actual job sites of the graduates and their stated preferences. This table showed that 70 respondents (38.33 percent) had the same current sites as the preferred one. Eight of the rural employees (6.57 percent) preferred to work in urban areas and eleven of them (9.17 percent) preferred to stay in urban areas with visits to the rural areas. Eleven of the urban employees (9.17 percent) preferred to visit the rural areas, whereas only three of them (2.50 percent) preferred to work in urban areas. Twelve of the respondents (10.00 percent) preferred to stay in urban areas without performing visits to rural areas and the percentage of respondents who preferred to stay in rural areas was (4.17 percent).

In response to the third question, 28 respondents (23.33 percent) thought that the faculty site had an
influence on their stated preference, whereas 84 respondents (70.66 percent) indicated that the faculty site had no influence on their site preference, and 8 respondents (6.67 percent) showed no opinion. Table 12 shows the influence of the faculty site on the graduate preference.

2. Social values learned by the faculty graduates

Two questions were concerned with this aspect. The first one discovered whether the faculty had provided its graduates with social activities by which their communities benefited out of it. The second question tried to detect the negative effect of the university life on the graduates. It concerned itself with the self-reliant ability of the graduates.

In response to the first question, 73 respondents (50.83 percent) indicated that they had social activities in the faculty and their communities benefited out of it, 47 respondents (39.17 percent) indicated that they had no social activities in the Faculty of Agriculture.
Table 10. Current and preferred employment sites of graduates.

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<th>Description</th>
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<tr>
<td>Rural area</td>
<td>49</td>
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<tr>
<td>Urban area</td>
<td>28</td>
<td>23.33</td>
</tr>
<tr>
<td>Urban area but with some official visits to rural area</td>
<td>49</td>
<td>40.83</td>
</tr>
<tr>
<td>Total</td>
<td>120</td>
<td>99.99</td>
</tr>
<tr>
<td>Preferred job sites</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rural area</td>
<td>30</td>
<td>25.00</td>
</tr>
<tr>
<td>Urban area</td>
<td>32</td>
<td>26.66</td>
</tr>
<tr>
<td>Urban with official visit to rural area</td>
<td>56</td>
<td>48.33</td>
</tr>
<tr>
<td>Total</td>
<td>120</td>
<td>99.99</td>
</tr>
</tbody>
</table>

* An error of ± 0.01 may appear in these tables as a result of figure rounding.
Table 11. Differences between graduates current work sites and their stated preferences.

<table>
<thead>
<tr>
<th>Description</th>
<th>Number of respondents</th>
<th>Percentage of respondents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Current site was the same as preferred one</td>
<td>70</td>
<td>58.33</td>
</tr>
<tr>
<td>Rural employees prefer to work in urban areas</td>
<td>8</td>
<td>6.67</td>
</tr>
<tr>
<td>Urban employees prefer to work in rural areas</td>
<td>3</td>
<td>2.50</td>
</tr>
<tr>
<td>Urban employees prefer to have some official visits to rural areas</td>
<td>11</td>
<td>9.17</td>
</tr>
<tr>
<td>Rural employees prefer to stay in urban but with visits to rural areas</td>
<td>11</td>
<td>9.17</td>
</tr>
<tr>
<td>Prefer to stay in urban areas without visit to rural areas</td>
<td>12</td>
<td>10.00</td>
</tr>
<tr>
<td>Prefer to stay eventually in rural areas</td>
<td>3</td>
<td>h.17</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>120</td>
<td><strong>100.01</strong></td>
</tr>
</tbody>
</table>
Table 12. Influence of the faculty site on the graduates preference.

<table>
<thead>
<tr>
<th>Description</th>
<th>Number of respondents</th>
<th>Percentage of respondents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Had an influence on their preference</td>
<td>25</td>
<td>25.83</td>
</tr>
<tr>
<td>Had no influence</td>
<td>84</td>
<td>70.00</td>
</tr>
<tr>
<td>No opinion</td>
<td>8</td>
<td>6.17</td>
</tr>
<tr>
<td>Total</td>
<td>120</td>
<td>100.00</td>
</tr>
</tbody>
</table>
Regarding the second question 69 respondents (40.83 percent) agreed that university life did not provide them with learning experiences to depend on themselves, and 63 respondents (34.17 percent) believed that the university life did not contribute to their self-independence or reliance, and 6 respondents (5.0 percent) had no opinion. Graduate answers to the first and second questions are shown in Tables 13 and 14 respectively.

3. Graduates job performance and job change phenomenon

Three questions deal with this aspect of study. In the first question the graduates were asked to rate their personal job performance. Rations listed in the questionnaires were very good, good, not bad, bad and very bad. The second question determined the percentage of graduates who changed their jobs and reasons for job change. The third question tried to compare the recent job performance with the previous one in the opinion of the graduate who changed his job.

Table 15 shows that, 72 respondents (60.00 percent) rated their jobs either very good or good, 37 respondents
Table 14. Graduates' attitudes towards effect of their university life on their ability to be self-reliant.

<table>
<thead>
<tr>
<th>Description</th>
<th>Number of respondents</th>
<th>Percentage of respondents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agreed that university life did not teach them how to depend on themselves</td>
<td>49</td>
<td>40.8%</td>
</tr>
<tr>
<td>Disagreed that university life did not teach them how to depend on themselves</td>
<td>55</td>
<td>34.17</td>
</tr>
<tr>
<td>No opinion</td>
<td>5</td>
<td>3.00</td>
</tr>
<tr>
<td>Total</td>
<td>120</td>
<td>100.0%</td>
</tr>
</tbody>
</table>
(39.83 percent) described it as not bad. Those who rated their job very bad or bad amounted to 11 respondents (9.17 percent).

Table 16 shows that 95 respondents (79.17 percent) did not change their jobs, while 23 respondents (19.83 percent) did change their jobs. Different reasons were pointed out for the job change. Seven graduates (11.00 percent) indicated the financial reason, 11 of them (44.00 percent) pointed out reasons related to nature of work, and 3 respondents (12.00 percent) indicated the academic reasons. The other reasons, as shown in the table, were indicated by lower percentages of the graduates.

Table 17 shows that 23 graduates (92.00 percent) of those who changed their jobs, were on the opinion that the recent job performance was better than the previous one, whereas 2 respondents (8.00 percent) believed that the previous job performance was better than the recent one.
Table 13. Ratings of personal job performance.

<table>
<thead>
<tr>
<th>Description</th>
<th>Number of respondents</th>
<th>Percentage of respondents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very good</td>
<td>29</td>
<td>19.47</td>
</tr>
<tr>
<td>Good</td>
<td>49</td>
<td>40.83</td>
</tr>
<tr>
<td>Not bad</td>
<td>37</td>
<td>30.03</td>
</tr>
<tr>
<td>Bad</td>
<td>8</td>
<td>5.57</td>
</tr>
<tr>
<td>Very bad</td>
<td>3</td>
<td>2.50</td>
</tr>
<tr>
<td>Total</td>
<td>129</td>
<td>100.00</td>
</tr>
</tbody>
</table>


### Table 16. Percentage of graduates that changed their jobs.

<table>
<thead>
<tr>
<th>Description</th>
<th>Number of Respondents</th>
<th>Percentage of Respondents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Changed their job</td>
<td>25</td>
<td>20.83</td>
</tr>
<tr>
<td>Did not change their job</td>
<td>95</td>
<td>79.17</td>
</tr>
<tr>
<td>Total</td>
<td>120</td>
<td>100.00</td>
</tr>
</tbody>
</table>
Table 16a. Reasons given for job changes.

<table>
<thead>
<tr>
<th>Description</th>
<th>Number of respondents</th>
<th>Percentage of respondents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Financial reasons</td>
<td>7</td>
<td>28.00</td>
</tr>
<tr>
<td>Reasons related to nature of work and interest</td>
<td>11</td>
<td>44.00</td>
</tr>
<tr>
<td>Academic reasons (e.g., being as research as teaching assistant)</td>
<td>3</td>
<td>12.00</td>
</tr>
<tr>
<td>Social reasons (have to live in rural area)</td>
<td>1</td>
<td>4.00</td>
</tr>
<tr>
<td>Administrative problems</td>
<td>2</td>
<td>8.00</td>
</tr>
<tr>
<td>Others</td>
<td>1</td>
<td>4.00</td>
</tr>
<tr>
<td>Total</td>
<td>25</td>
<td>100.00</td>
</tr>
</tbody>
</table>

*Note that Table 16a has been deducted from Table 16 in which number of graduates who changed their jobs is 25.*
Table 17. Opinions of graduates about their previous and present job performance.

<table>
<thead>
<tr>
<th>Description</th>
<th>Number of Respondents</th>
<th>Percentage of Respondents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thought the recent job performance is better</td>
<td>23</td>
<td>82</td>
</tr>
<tr>
<td>Thought the previous one was better</td>
<td>2</td>
<td>8</td>
</tr>
<tr>
<td>Total</td>
<td>25</td>
<td>100</td>
</tr>
</tbody>
</table>

*Table 17 is also deducted from Table 16 in which number of graduates who changed their jobs is 25.*
4. Problems faced by the graduates

The only one question in this aspect asks the graduates to identify their most pressing work-related problems. In response, the financial problems due to the poor offers were most often cited by the graduates as 73 respondents (60.63 percent) did so, while 40 respondents (33.33 percent) pointed out the lack of interesting social activities, such as those they experienced during their studies. Administrative problems connected to relations with bosses were identified by 31 respondents (25.83 percent), and 46 respondents (38.33 percent) specified other problems that they faced in their work such as lack of facilities, training, and the work itself. Table 18 above answers to this question.

5. Post-graduation training

The survey included three questions that elicited the graduates' views on their post-graduate training. The first question estimated the percentage of post-graduation training among the respondents.
Table 16. Problems faced by the graduates in their work.

<table>
<thead>
<tr>
<th>Description</th>
<th>Number of respondents</th>
<th>Percentage of respondents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Financial problems because of poor offers</td>
<td>73</td>
<td>80.83</td>
</tr>
<tr>
<td>Lack of interesting social relations and cultural activities similar to those found in the faculty</td>
<td>40</td>
<td>33.33</td>
</tr>
<tr>
<td>Administrative problems caused by bosses e.g. (known)</td>
<td>31</td>
<td>25.83</td>
</tr>
<tr>
<td>Others (mentioned lack of work, lack of facilities, training and irrelevancy of work etc.)</td>
<td>46</td>
<td>38.33</td>
</tr>
<tr>
<td>Description</td>
<td>Number of respondents</td>
<td>Percentages of respondents</td>
</tr>
<tr>
<td>-----------------------------------------------------------------------------</td>
<td>-----------------------</td>
<td>----------------------------</td>
</tr>
<tr>
<td>Financial problems because of poor offers</td>
<td>73</td>
<td>80.83</td>
</tr>
<tr>
<td>Lack of interesting social relations and cultural activities similar to those found in the faculty</td>
<td>40</td>
<td>23.33</td>
</tr>
<tr>
<td>Administrative problems caused by bosses e.g. (Superiors)</td>
<td>31</td>
<td>25.00</td>
</tr>
<tr>
<td>Others (mentioned lack of work, lack of facilities, training and irrelevance of work etc.)</td>
<td>45</td>
<td>38.03</td>
</tr>
</tbody>
</table>
The second question discovered the graduates' opinion about the agricultural engineers' opportunities for training compared to the graduates of other faculties and institutes in the country. The third question tried to determine the suitable type of post-graduation training needed by the graduates for different jobs.

Table 19 shows that 49 respondents (40.83 percent) received training after graduation, and 71 respondents (39.17 percent) did not receive training after graduation.

Table 20

This table shows that 17 respondents (14.17 percent) described the opportunities of post-graduate training for agricultural engineers in the country as very good, 27 respondents (22.50 percent) rated it as good, 30 respondents (25.00 percent) rated it as fair, 35 respondents (29.17 percent) rated it as bad, and 11 respondent (9.17 percent) described the opportunities of post-graduate training as very bad.
Table 19. Percentage of post-graduate training opportunities.

<table>
<thead>
<tr>
<th>Description</th>
<th>Number of respondents</th>
<th>Percentage of respondents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Received training after graduation</td>
<td>49</td>
<td>40.83</td>
</tr>
<tr>
<td>Did not receive training after graduation</td>
<td>71</td>
<td>59.17</td>
</tr>
<tr>
<td>Total</td>
<td>120</td>
<td>100.00</td>
</tr>
</tbody>
</table>
Table 20. Graduate opinion about the agricultural engineers’ opportunities of training compared to graduates of other faculties and institutes in the country.

<table>
<thead>
<tr>
<th>Description</th>
<th>Number of Respondents</th>
<th>Percentage of Respondents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very good</td>
<td>17</td>
<td>14.17</td>
</tr>
<tr>
<td>Good</td>
<td>27</td>
<td>22.30</td>
</tr>
<tr>
<td>Fair</td>
<td>30</td>
<td>25.00</td>
</tr>
<tr>
<td>Bad</td>
<td>35</td>
<td>25.17</td>
</tr>
<tr>
<td>Very bad</td>
<td>11</td>
<td>9.17</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>120</strong></td>
<td><strong>100.01</strong></td>
</tr>
</tbody>
</table>
Table 31

From this table 42 respondents (33.33 percent) indicated that their jobs need more practical skill and short training courses is the best type to suit their jobs, 40 respondents (33.00 percent) indicated that their jobs need extra-academic study, and therefore post-graduate study is better. 37 respondents (29.83 percent) specified the course unit system as the best type of training that suits their jobs, and 7 respondents (5.67 percent) indicated that the B.Sc. training is quite sufficient and no need for more training.

4.11 Graduate Satisfaction with the B.Sc. Program in Terms of its Relevance to Their Jobs Situation

1. Degree to which the B.Sc. program met educational needs

In response to the question of the degree to which the B.Sc. program met the educational needs of graduates, 89 respondents (74.17 percent) indicated that the program met some of their needs, 21 respondents (17.50 percent) were on the opinion that the program met most of their
Table 21. Graduates attitudes towards the suitable type of post-graduate training needed by their jobs.

<table>
<thead>
<tr>
<th>Description</th>
<th>Number of Respondents</th>
<th>Percentage of Respondents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Their jobs need more practical skill and short training courses are better</td>
<td>42</td>
<td>53.33</td>
</tr>
<tr>
<td>Their jobs need extra academic study, therefore post-graduate study is better</td>
<td>40</td>
<td>35.00</td>
</tr>
<tr>
<td>Post-graduate study with course unit system is the best type of training that suits their jobs</td>
<td>31</td>
<td>25.81</td>
</tr>
<tr>
<td>B.Sc, training is quite sufficient and no need for more training</td>
<td>7</td>
<td>5.69</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>150</strong></td>
<td><strong>99.99</strong></td>
</tr>
</tbody>
</table>
needs, 5 respondents (4.17 percent) mentioned that the program met all or nearly all of their needs while only 3 respondents (4.17 percent) believed that the program did not meet their needs (Table 22 shows opinion of the graduates about the degree to which the B.Sc. program met their educational needs).

2. **Relevance of the curriculum to the actual job requirements**

Table 23 indicates the relevance of the curriculum to the actual job requirements. At least more than half of the respondents (55.00 percent) were on the opinion that their jobs were partially related to what was studied but more practical training and theoretical knowledge would be needed. Thirty-two graduates (36.67 percent) believed that the jobs were closely related to what they studied and both theory and practical components were suitable. While 7 graduates (8.33 percent) indicated that their jobs nature does not necessarily need B.Sc. degree, and 6 graduates (7.00 percent) indicated that their jobs have nothing to do with what they studied in the Faculty of Agriculture.
Table 22. Degree to which the B.Sc. program met educational needs of graduates.

<table>
<thead>
<tr>
<th>Description</th>
<th>Number of Respondents</th>
<th>Percentage of Respondents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Did not meet their needs</td>
<td>5</td>
<td>4.17</td>
</tr>
<tr>
<td>Not some of their needs</td>
<td>89</td>
<td>76.17</td>
</tr>
<tr>
<td>Not most of their needs</td>
<td>21</td>
<td>17.30</td>
</tr>
<tr>
<td>Not all or nearly all their needs</td>
<td>5</td>
<td>4.17</td>
</tr>
<tr>
<td>Total</td>
<td>120</td>
<td>100.00</td>
</tr>
<tr>
<td>Description</td>
<td>Number of Respondents</td>
<td>Percentage of Respondents</td>
</tr>
<tr>
<td>----------------------------------------------------------------------------</td>
<td>-----------------------</td>
<td>---------------------------</td>
</tr>
<tr>
<td>Job is so related to what was studied and both theory and practical components were suitable</td>
<td>32</td>
<td>26.67</td>
</tr>
<tr>
<td>The job is too complicated and needs extra theoretical knowledge</td>
<td>8</td>
<td>6.67</td>
</tr>
<tr>
<td>The job is partially related to what was studied and it needs more practical training and more related knowledge</td>
<td>86</td>
<td>59.99</td>
</tr>
<tr>
<td>The job is not of a scientific nature and not necessarily needs a B.Sc. holder</td>
<td>7</td>
<td>5.83</td>
</tr>
<tr>
<td>The job has nothing to do with what was offered in the Faculty of Agriculture</td>
<td>6</td>
<td>5.00</td>
</tr>
<tr>
<td>Lack of job itself</td>
<td>1</td>
<td>0.83</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>120</td>
<td><strong>100.00</strong></td>
</tr>
</tbody>
</table>
4.1.1 Graduate’s Interests and the Reasons for Being Enrolled in the Faculty of Agriculture

1. Needs and Interests towards the Faculty of Agriculture enrollment

The graduates were asked to rank their needs and interests towards the faculty enrollment. Sixty-four respondents (53.33 percent) ranked agriculture as a career to make a living out of it as number one, while 33 respondents (26.66 percent) were on the opinion that to satisfy the individual interest of enjoying scientific findings and theories should be given the highest rank. Those who supported that faculty graduation will lead to respect and prestige among the society was ranked as number one constituted 13.33 percent (16 respondents). Enjoy working as an agricultural engineer gained 7 respondents (5.83 percent), to categorize it as the first preference (Table 24). Regarding the satisfaction degree of graduates needs and interests, 35 graduates (30.00 percent) indicated that they were satisfied, 32 graduates (27.33 percent) were partially satisfied and 32 graduates (26.80 percent) were not satisfied.
2. Reasons for Joining Faculty of Agriculture

As shown in Table 25, 73 graduates (60.0 percent) indicated that they joined the Faculty of Agriculture because they were not selected to the Faculty of Medicine and had no interest in the other alternatives. Those who were interested in agriculture as a career and joined the Faculty of Agriculture on this basis constituted about 37 percent (44 respondents). Two graduates (1.57 percent) were influenced by their friends and for that reason they joined the Faculty of Agriculture.

IV. Graduates' Attitudes Towards the Selection System of the Faculty of Agriculture and the English Language as a Medium of Instruction

Three questions were formulated to cover this particular area of the study. The first question was concerned with the selection system of the Faculty as to which is better; the selection from secondary schools or selection from Faculty of Science? The second question determined the increase in levels of comprehension from preliminary year to the Faculty of Agriculture, based on the experience of the graduates.
Table 24. Interests of the graduates in the Faculty of Agriculture.

<table>
<thead>
<tr>
<th>Description</th>
<th>First rank</th>
<th></th>
<th>Second rank</th>
<th></th>
<th>Third rank</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No.</td>
<td>Percent</td>
<td>No.</td>
<td>Percent</td>
<td>No.</td>
<td>Percent</td>
</tr>
<tr>
<td>To get a degree in agriculture and make a living out of it i.e. having agric. as career</td>
<td>64</td>
<td>53.33</td>
<td>20</td>
<td>16.67</td>
<td>7</td>
<td>5.83</td>
</tr>
<tr>
<td>Graduation from the Faculty leads to respect and prestige among the society</td>
<td>16</td>
<td>13.33</td>
<td>26</td>
<td>21.67</td>
<td>14</td>
<td>11.67</td>
</tr>
<tr>
<td>To satisfy interest of enjoying scientific findings and enquiries</td>
<td>32</td>
<td>26.66</td>
<td>24</td>
<td>19.57</td>
<td>18</td>
<td>15.07</td>
</tr>
<tr>
<td>Enjoy working as agricultural engineers e.g. agric. inspector, horticulturist etc.</td>
<td>7</td>
<td>5.83</td>
<td>14</td>
<td>11.67</td>
<td>2</td>
<td>1.73</td>
</tr>
<tr>
<td>Others</td>
<td>1</td>
<td>0.83</td>
<td>-</td>
<td>-</td>
<td>3</td>
<td>2.50</td>
</tr>
</tbody>
</table>

Satisfaction degree of graduates' needs and interests.

<table>
<thead>
<tr>
<th>Description</th>
<th>First rank</th>
<th></th>
<th>Second rank</th>
<th></th>
<th>Third rank</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No.</td>
<td>Percent</td>
<td>No.</td>
<td>Percent</td>
<td>No.</td>
<td>Percent</td>
</tr>
<tr>
<td>Satisfied</td>
<td>36</td>
<td>30.00</td>
<td>38</td>
<td>31.67</td>
<td>11</td>
<td>9.17</td>
</tr>
<tr>
<td>Partially satisfied</td>
<td>52</td>
<td>43.33</td>
<td>33</td>
<td>28.33</td>
<td>31</td>
<td>26.17</td>
</tr>
<tr>
<td>Not satisfied</td>
<td>32</td>
<td>26.67</td>
<td>18</td>
<td>14.92</td>
<td>12</td>
<td>10.00</td>
</tr>
</tbody>
</table>
Table 25. Reasons for joining the Faculty of Agriculture.

<table>
<thead>
<tr>
<th>Reason</th>
<th>Number of respondents</th>
<th>Percentage of respondents</th>
</tr>
</thead>
<tbody>
<tr>
<td>They were not selected to the Faculty of Medicine and had no interest in the other alternatives</td>
<td>73</td>
<td>60.83</td>
</tr>
<tr>
<td>They were attracted by the living conditions in Shambat</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>They were interested in agriculture as a career</td>
<td>44</td>
<td>36.67</td>
</tr>
<tr>
<td>Most of their friends were in agriculture</td>
<td>2</td>
<td>1.67</td>
</tr>
<tr>
<td>Others</td>
<td>1</td>
<td>0.53</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>120</strong></td>
<td><strong>100.00</strong></td>
</tr>
</tbody>
</table>
The third question addressed the graduates' attitudes towards the English language as a medium of instruction in the faculty.

In response to the above questions, 73 respondents (60.83 percent) preferred the selection for the Faculty of Medicine, Faculty of Pharmacy, Faculty of Agriculture, Faculty of Veterinary Science and Faculty of Science at the end of the preliminary year than the direct selection from secondary schools. Those who supported direct selection from secondary schools constituted 39.17 percent (67 respondents).

A reasonable majority, 89 respondents (74.17 percent) were on the opinion that their levels of comprehension increased significantly from preliminary year to the Faculty of Agriculture; 29 respondents (24.17 percent) felt that the increase was not significant, while 2 respondents (1.67 percent) did not feel any difference in comprehension.

Table 26 shows that 50 graduates (30.00 percent) considered the English language as a real problem...
Table 25. Graduates attitude towards English language as a medium of instruction in the Faculty of Agriculture.

<table>
<thead>
<tr>
<th>Description</th>
<th>Number of respondents</th>
<th>Percentage of respondents</th>
</tr>
</thead>
<tbody>
<tr>
<td>English language is a problem in both comprehension and expression and they prefer its substitution by Arabic Language</td>
<td>3</td>
<td>2.50</td>
</tr>
<tr>
<td>English language is not an obstacle to study any field of science</td>
<td>36</td>
<td>28.33</td>
</tr>
<tr>
<td>English language is a problem but it does not go to the extent of being replaced by Arabic language since that needs translation of references and scientific terms</td>
<td>27</td>
<td>19.17</td>
</tr>
<tr>
<td>It is a real problem during the first weeks of the preliminary year but students usually are able to cope with afterwards</td>
<td>60</td>
<td>50.00</td>
</tr>
<tr>
<td>Total</td>
<td>120</td>
<td>100.00</td>
</tr>
</tbody>
</table>
during the first weeks of the preliminary year, but
the students usually cope with it afterwards. Thirty-
four respondents (28.33 percent) indicated that the
English language is not an obstacle for studying any
field of science. The respondents who thought that
the English language is a problem, but it does not go
to the extent of being replaced by Arabic, were 23
(19.17 percent). The graduates who were on the opinion
that the English language is a problem for both
comprehension and expression and should be replaced
by Arabic language were 3 (2.50 percent).

4.V The Effectiveness of the Teaching Methods

The graduates were asked to evaluate the teaching
methods used at the faculty. The evaluation was based
on four rating scales as good, fair, poor and not used.
A full summary of their responses is presented in
Table 27. Seventy-eight respondents (65 percent)
rated the lecture method as good, 35 respondents (29.17
percent) rated it as fair and 7 respondents (5.83 per-
cent) rated it as poor. Concerning practical teaching
method 51 graduates (42.30 percent) considered it to be
Table 27. Ratings of respondents for the teaching methods used by the faculty.

<table>
<thead>
<tr>
<th>Method</th>
<th>Good</th>
<th>Fair</th>
<th>Poor</th>
<th>Not used</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No.</td>
<td>%</td>
<td>No.</td>
<td>%</td>
</tr>
<tr>
<td>Lectures</td>
<td>78</td>
<td>65.00</td>
<td>33</td>
<td>29.17</td>
</tr>
<tr>
<td>Practicals</td>
<td>23</td>
<td>23.33</td>
<td>44</td>
<td>34.17</td>
</tr>
<tr>
<td>Seminars</td>
<td>2</td>
<td>1.67</td>
<td>5</td>
<td>4.17</td>
</tr>
<tr>
<td>Working in group</td>
<td>3</td>
<td>2.50</td>
<td>18</td>
<td>15.00</td>
</tr>
<tr>
<td>Guest speakers</td>
<td>-</td>
<td>-</td>
<td>7</td>
<td>5.83</td>
</tr>
<tr>
<td>Tours</td>
<td>4</td>
<td>3.33</td>
<td>26</td>
<td>20.00</td>
</tr>
<tr>
<td>Educational films</td>
<td>2</td>
<td>1.67</td>
<td>5</td>
<td>4.17</td>
</tr>
<tr>
<td>Assignments</td>
<td>3</td>
<td>2.50</td>
<td>19</td>
<td>15.83</td>
</tr>
<tr>
<td>Tests</td>
<td>8</td>
<td>6.67</td>
<td>38</td>
<td>31.67</td>
</tr>
<tr>
<td>Learning by doing</td>
<td>-</td>
<td>-</td>
<td>8</td>
<td>7.5</td>
</tr>
<tr>
<td>Dissertation</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

Note: Total number of respondents rating each method is 120.
poor, 41 graduates (34.17 percent) rated it as fair while 28 respondents (23.33 percent) were on the opinion that it was good. The following teaching methods were rated poor by more than (50 percent) of respondents.

1. Seminars
2. Working in groups
3. Guest speakers
4. Tours
5. Assignments
6. Learning by doing
7. Tests

Only four graduates (3.33 percent) had the dissertation experience because it was not employed since 1972 due to the increase in students number.

Table 26

To know the best teaching methods students usually prefer, the graduates were asked to put the teaching methods they came across in the faculty in ranks or orders according to their preferences. In response, 89 respondents (74.17 percent) supported the lecture method as the first rank and 86 respondents (71.67 percent) put the practical method in the second rank.
The method as the third rank was advocated by 28 graduates (23.33 percent). Other methods were ranked as fourth rank or below. Table 28 gives the exact details concerning the different ranks.

The above results go in line with the previous teaching methods evaluation. Still the majority prefer or support the lecture as the best teaching method, and practicals come next.

Table 29 shows that 82 graduates (68.33 percent) supported the style of lecture which enables students to digest, comprehend the material and take notes. Twenty graduates (16.67 percent) preferred giving out handouts at the end of the lecture while 15 graduates (12.33 percent) would like to be provided with references to support the lecture. Those who preferred dictation style constituted 2.50 percent (3 respondents). On the other side, 109 respondents (90.83 percent) agreed that dictation contributed to the absence of students from lectures.
<table>
<thead>
<tr>
<th>Lecturing style</th>
<th>Number of respondents</th>
<th>Percentage of respondents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dictating</td>
<td>3</td>
<td>2.50</td>
</tr>
<tr>
<td>Lecturing and giving handouts at the end of the lecture</td>
<td>20</td>
<td>16.67</td>
</tr>
<tr>
<td>Lecturing and only give references</td>
<td>13</td>
<td>12.50</td>
</tr>
<tr>
<td>Lecturing in a manner that enables students to take notes</td>
<td>82</td>
<td>68.73</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>120</strong></td>
<td><strong>100.00</strong></td>
</tr>
</tbody>
</table>
IV. VI. Sufficiency of courses for students qualifications

1. Sufficiency of the five-year period

Table 30 shows that 100 graduates (83.33 percent) believed that the time spent in the Faculty of Agriculture is quite sufficient to equip the graduates with the needed learning experiences at the B.Sc level.

Ten respondents (8.33 percent) were on the opinion that the time is more than really needed and must be reduced while the same percentage felt that it is not enough and it should be increased.

2. Two years of specialization

The graduates' response indicated that 106 graduates (88.34 percent) would support the two-year specialization system rather than the one-year option. Thirteen graduates (10.81 percent) would prefer the continuation of the existing one-year option and less than one percent would not make any difference to them.

Table 31 shows the details of graduates' response.

IV. VII. Graduate Attitudes Towards Implementation of Option System in the Faculty
Table 30. The graduates attitudes towards the sufficiency of the five-year period for students qualification.

<table>
<thead>
<tr>
<th>Description</th>
<th>Number of respondents</th>
<th>Percentage of respondents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quite enough</td>
<td>100</td>
<td>83.33</td>
</tr>
<tr>
<td>More than enough and need to be reduced</td>
<td>10</td>
<td>8.33</td>
</tr>
<tr>
<td>Not enough and need to be increased</td>
<td>10</td>
<td>8.33</td>
</tr>
<tr>
<td>No opinion</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>120</td>
<td><strong>99.92</strong></td>
</tr>
</tbody>
</table>
Table 31. Graduates' response to the two-year system of specialization.

<table>
<thead>
<tr>
<th>Description</th>
<th>Number of respondents</th>
<th>Percentage of respondents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strongly agree</td>
<td>23</td>
<td>89.17</td>
</tr>
<tr>
<td>Agree</td>
<td>23</td>
<td>15.17</td>
</tr>
<tr>
<td>Disagree</td>
<td>9</td>
<td>7.50</td>
</tr>
<tr>
<td>Strongly disagree</td>
<td>4</td>
<td>3.33</td>
</tr>
<tr>
<td>No opinion</td>
<td>1</td>
<td>0.83</td>
</tr>
<tr>
<td>Total</td>
<td>120</td>
<td>100.00</td>
</tr>
</tbody>
</table>
1. **Objectives of the option system**

When the option system had been introduced in the faculty, it was assumed to provide more time for students to think, read and enjoy their respective subjects. Graduates were asked whether they agreed to the achievement of these objectives or not. In response, 94 respondents (78.33 percent) either strongly agreed or just agree that the objectives were achieved, while 22 respondents (18.34 percent) disagreed, and 5 respondents (3.33 percent) had no opinion. Table 92 shows the exact details of graduates responses.

The graduates were requested also to indicate whether there is an increase of eight aspects in the final year compared to the first three years spent in the faculty. The concerned eight aspects are assumed to determine studying effort and performance of students. In response, 85 respondents (71.67 percent) indicated that their interest increased in the final year. Regarding the attendance, 69 respondents (57.50 percent) thought that their attendance increased, while 50 respondents (33.33 percent) stated that it was constant.
The graduates who showed an increase in the library visits constituted 77 (64.17 percent); however 27 respondents (22.50 percent) believed it was constant. The increase of teacher relationship with students in the final year was supported by 79 graduates (65.83 percent) whereas 30 respondents (25.00 percent) were on the opinion that there was no increase.

The number of respondents who thought that home work increased in the final year is 58 (48.33 percent), and 34 respondents (28.33 percent) believed that it was constant. The decrease of practical work, teaching load and supplementaries in the final year was supported by 56 respondents (48.67 percent), 108 respondents (90.00 percent) and 68 respondents (56.00 percent) respectively (Table 33).

2. **Reasons for selecting the major subject**

As shown in Table 34, 84 respondents (70.00 percent) indicated that they selected their major subject because they liked it as a field of science. The other reasons were supported by small portion ranging between 2.5-16.67 percent.
Table 32. Responses of the graduates to the statement that the objectives of the option system "is to provide more time for students to think, read and enjoy their respective subjects".

<table>
<thead>
<tr>
<th>Description</th>
<th>Number of Respondents</th>
<th>Percentage of Respondents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strongly agree</td>
<td>89</td>
<td>40.83</td>
</tr>
<tr>
<td>Agree</td>
<td>43</td>
<td>17.50</td>
</tr>
<tr>
<td>Disagree</td>
<td>17</td>
<td>14.17</td>
</tr>
<tr>
<td>Strongly disagree</td>
<td>3</td>
<td>4.17</td>
</tr>
<tr>
<td>No opinion</td>
<td>4</td>
<td>3.33</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>120</strong></td>
<td><strong>100.00</strong></td>
</tr>
</tbody>
</table>


Table 33. Percentage of graduates based on their opinion of eight aspects increase in the final year compared to the first three years.

<table>
<thead>
<tr>
<th>Aspect</th>
<th>Increase</th>
<th>Decrease</th>
<th>Constant</th>
<th>No opinion</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No.</td>
<td>Percent</td>
<td>No.</td>
<td>Percent</td>
</tr>
<tr>
<td>Interest</td>
<td>86</td>
<td>71.67</td>
<td>10</td>
<td>8.33</td>
</tr>
<tr>
<td>Attendance</td>
<td>69</td>
<td>57.30</td>
<td>10</td>
<td>8.33</td>
</tr>
<tr>
<td>Library visits</td>
<td>77</td>
<td>64.17</td>
<td>14</td>
<td>11.67</td>
</tr>
<tr>
<td>Teacher relationship</td>
<td>79</td>
<td>63.89</td>
<td>4</td>
<td>3.33</td>
</tr>
<tr>
<td>Home work</td>
<td>58</td>
<td>48.33</td>
<td>22</td>
<td>18.33</td>
</tr>
<tr>
<td>Practical work</td>
<td>52</td>
<td>43.33</td>
<td>36</td>
<td>46.67</td>
</tr>
<tr>
<td>Teaching load</td>
<td>3</td>
<td>2.30</td>
<td>108</td>
<td>90.00</td>
</tr>
<tr>
<td>Supplementary</td>
<td>3</td>
<td>2.30</td>
<td>68</td>
<td>56.57</td>
</tr>
</tbody>
</table>
3. Relevance of the option courses to the current jobs

When the respondents were asked to indicate the relevance of the option courses they had in the Faculty to their current jobs, 105 graduates (57.50 percent) stated either very related or slightly related whereas 14 graduates (11.67 percent) were of the opinion that they were not related (Table 35).

Table 36 shows that 49 respondents (40.83 percent) were of the opinion that the number of options in the Faculty was quite suitable and covered all types of available agricultural jobs; 28 respondents (23.73 percent) thought that the options were not enough and there was a need for more ones. The number of respondents who pointed that the number of options in the Faculty was enough but there was a need to replace some of them by new ones to meet the field requirements was 22 (18.33 percent). Twenty-one respondents (17.50 percent) thought that the number of options have to be minimized and adjusted to the type of work available.
<table>
<thead>
<tr>
<th>Reason</th>
<th>Number of Respondents</th>
<th>Percentage of Respondents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Because you get higher marks in it</td>
<td>3</td>
<td>2.30</td>
</tr>
<tr>
<td>Because you like it as a subject</td>
<td>84</td>
<td>70.00</td>
</tr>
<tr>
<td>Because you feel it is needed by the country</td>
<td>20</td>
<td>16.67</td>
</tr>
<tr>
<td>Because there are better opportunities of work in this field</td>
<td>13</td>
<td>10.83</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>130</strong></td>
<td><strong>100.00</strong></td>
</tr>
</tbody>
</table>
Table 35. Relevance of option courses to the graduates' current jobs.

<table>
<thead>
<tr>
<th>Description</th>
<th>Number of Respondents</th>
<th>Percentage of Respondents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very related</td>
<td>48</td>
<td>50.00</td>
</tr>
<tr>
<td>Slightly related</td>
<td>57</td>
<td>57.30</td>
</tr>
<tr>
<td>Not related</td>
<td>14</td>
<td>11.67</td>
</tr>
<tr>
<td>No opinion</td>
<td>1</td>
<td>0.83</td>
</tr>
<tr>
<td>Total</td>
<td>120</td>
<td>100.00</td>
</tr>
</tbody>
</table>
Table 36. Graduates' opinion about the number of options in the faculty in relation to the field work availability.

<table>
<thead>
<tr>
<th>Description</th>
<th>Number of respondents</th>
<th>Percentage of respondents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of options is quite suitable and cover all types of field work available.</td>
<td>49</td>
<td>40.83</td>
</tr>
<tr>
<td>Number of options is not enough and there is a need for more options</td>
<td>28</td>
<td>23.53</td>
</tr>
<tr>
<td>Number of options is enough but there is a need to replace some options by others to meet the field requirements</td>
<td>22</td>
<td>18.33</td>
</tr>
<tr>
<td>Number of options have to be minimized and adjusted to the type of work available</td>
<td>31</td>
<td>17.50</td>
</tr>
<tr>
<td>Total</td>
<td>120</td>
<td>99.93</td>
</tr>
</tbody>
</table>
4.11.11 Graduate impressions about instructors and teaching facilities

1. Instructors’ teaching abilities

Graduates were asked to give ratings to their instructors' teaching abilities. Ratings were stated as poor, adequate, good and excellent. As shown in Table 37, 55 respondents (45.89 percent) rated them as good, 10 respondents (8.33 percent) rated them as excellent; 42 respondents (35.00 percent) rated them as adequate; and 13 respondents (10.33 percent) indicated that the instructors teaching abilities were poor.

2. Faculty teaching facilities

The teaching facilities meant in this question were the classrooms, library and laboratories. Description used in the questionnaire was “completely inadequate, partially inadequate, adequate and very adequate”.

In answering the question, 61 respondents (50.83 percent) described classrooms as partially inadequate, 23 respondents (30.83 percent) pointed out completely inadequate, and 13 respondents (27.50 percent) indicated that classrooms were adequate.
Regarding the library, 49 respondents (40.37 percent) described it as partially inadequate, 22 respondents (19.33 percent) indicated it as completely inadequate, and 33 respondents (27.30 percent) described the library as adequate.

Considering the laboratories 42 respondents (35.00 percent) described it as completely inadequate, 59 respondents (49.17 percent) indicated that laboratories were partially inadequate. Table 38 shows the details of graduates answers to this question.

4. IX The Assessment of Students Performance as Seen by the Graduates

1. Frequency of class-attendance

In this question, graduates were asked to judge their frequency of class-attendance. In response, as shown in Table 39, 81 respondents (67.30 percent) judged their frequency as regular, 23 respondents (19.17 percent) described it as more than average; 11 respondents judged it as average and 5 respondents indicated that the frequency of their class attendance was poor.
Table 37. Gradients ratings of instructors' teaching abilities.

<table>
<thead>
<tr>
<th>Rate</th>
<th>Number of respondents</th>
<th>Percentage of respondents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Poor</td>
<td>13</td>
<td>10.83</td>
</tr>
<tr>
<td>Adequate</td>
<td>42</td>
<td>35.00</td>
</tr>
<tr>
<td>Good</td>
<td>55</td>
<td>45.83</td>
</tr>
<tr>
<td>Excellent</td>
<td>10</td>
<td>8.33</td>
</tr>
<tr>
<td>Total</td>
<td>120</td>
<td>99.99</td>
</tr>
</tbody>
</table>
Table 38. The graduates' impressions about the faculty teaching facilities.

<table>
<thead>
<tr>
<th>Facility</th>
<th>Completely Inadequate</th>
<th>Partially Inadequate</th>
<th>Adequate</th>
<th>Very Adequate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Classrooms</td>
<td>45 20.83</td>
<td>61 50.83</td>
<td>33 27.50</td>
<td>1 0.83</td>
</tr>
<tr>
<td>Library</td>
<td>28 23.33</td>
<td>49 40.83</td>
<td>33 27.50</td>
<td>10 8.33</td>
</tr>
<tr>
<td>Laboratories</td>
<td>42 33.00</td>
<td>39 42.17</td>
<td>16 13.33</td>
<td>3 2.50</td>
</tr>
</tbody>
</table>
2. Frequency of studying during the year

The results of the above question showed that 70 respondents (58.33 percent) studied and revised their lessons from time to time; 25 respondents (20.83 percent) studied only when examinations are about to come; 14 respondents (11.67 percent) studied day by day; and 11 respondents (5.77 percent) studied when there was an assignment or homework. Table 10 shows the details of the studying effort during the year.

3. Examinations as a method of assessment

Table 11 shows the graduates' answers to the question related to the (three hours) examinations (mainly theory with little percentage of practical) and whether it was fair to assess their performance during their study in the faculty. From the table, 57 respondents (47.50 percent) indicated that the examination would have been fair enough if further consideration had been given to the practical side. The percentage of respondents who thought examination was not fair at all is 32.30 percent (27 respondents).
Table 39. The frequency of the graduates class attendance:

<table>
<thead>
<tr>
<th>Description</th>
<th>Number of respondents</th>
<th>Percentage of respondents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Regular</td>
<td>81</td>
<td>57.30</td>
</tr>
<tr>
<td>More than average</td>
<td>23</td>
<td>19.17</td>
</tr>
<tr>
<td>Average</td>
<td>14</td>
<td>9.17</td>
</tr>
<tr>
<td>Poor</td>
<td>5</td>
<td>4.17</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>120</strong></td>
<td><strong>100.01</strong></td>
</tr>
<tr>
<td>Description</td>
<td>Number of respondents</td>
<td>Percentage of respondents</td>
</tr>
<tr>
<td>-----------------------------------------------------------</td>
<td>-----------------------</td>
<td>---------------------------</td>
</tr>
<tr>
<td>Studied and revised day by day</td>
<td>14</td>
<td>11.57</td>
</tr>
<tr>
<td>Studied and revised from time to time</td>
<td>70</td>
<td>58.33</td>
</tr>
<tr>
<td>Studied and revised only when there was an assignment or homework</td>
<td>11</td>
<td>9.17</td>
</tr>
<tr>
<td>Studied and revised and even completed their lecture notes only when examinations were about to come</td>
<td>23</td>
<td>19.83</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>120</strong></td>
<td><strong>100.00</strong></td>
</tr>
<tr>
<td>Description</td>
<td>Number of respondents</td>
<td>Percentage of respondents</td>
</tr>
<tr>
<td>-----------------------------------------------------------------------------</td>
<td>-----------------------</td>
<td>--------------------------</td>
</tr>
<tr>
<td>It was fair enough to assess was performance</td>
<td>15</td>
<td>12.50</td>
</tr>
<tr>
<td>It was only fair on the semester basis which relieved the tension of the examinations very much</td>
<td>27</td>
<td>17.50</td>
</tr>
<tr>
<td>It would have been fair if further consideration had been given to the practical side</td>
<td>37</td>
<td>47.50</td>
</tr>
<tr>
<td>It was not fair at all</td>
<td>27</td>
<td>22.50</td>
</tr>
<tr>
<td>Total</td>
<td>120</td>
<td>100.00</td>
</tr>
</tbody>
</table>
Twenty-one graduates (17.30 percent) indicated that the examinations method was only fair on the semester basis which relieved the tension of the examinations very much. Fifteen graduates (12.50 percent) thought that the examination was fair enough to assess their performance.

4. Formula for assessing the general final results

Table 42 shows the percentages of respondents who agreed to four formulae given in the question for assessing the final result. From the table, 41 graduates (39.17 percent) agreed with the formula (40% for the first three years and 60% for the final year), 44 graduates (35.87 percent) favoured the formula of (25% for each year) (Table 42).

5. Factors affecting the general final results

When the graduates were asked about the effectiveness of five factors assumed to affect the general final results of students, 109 respondents (90.83 percent) indicated that individual effort is the main factor influencing the final results. Considering the semester system 39 respondents (49.17 percent) thought that it
Table 42. Graduates opinion about formulae assessing the general final results.

<table>
<thead>
<tr>
<th>Formula</th>
<th>Number of respondents</th>
<th>Percentage of respondents</th>
</tr>
</thead>
<tbody>
<tr>
<td>50% first three years</td>
<td>17</td>
<td>14.17</td>
</tr>
<tr>
<td>50% final year</td>
<td></td>
<td></td>
</tr>
<tr>
<td>40% first three years</td>
<td>47</td>
<td>39.17</td>
</tr>
<tr>
<td>60% final year</td>
<td></td>
<td></td>
</tr>
<tr>
<td>To be taken only from the final year</td>
<td>5</td>
<td>4.17</td>
</tr>
<tr>
<td>27% for each year</td>
<td>44</td>
<td>35.67</td>
</tr>
<tr>
<td>Others</td>
<td>2</td>
<td>2.83</td>
</tr>
<tr>
<td>Total</td>
<td>120</td>
<td>100.01</td>
</tr>
</tbody>
</table>
has a strong affect, and 54 respondents (43.00 percent) indicated that the semester system affects the students’ result slightly. The percentage of the respondents who thought that the option system had a strong effect on the students’ final result was 60 percent (72 graduates). However, 36 graduates (30.00 percent) of the respondents indicated that the option system affected the students’ results slightly.

With regard to the teaching load, 41 respondents (38.17 percent) believed that it had a strong affect, and 59 respondents (49.16 percent) indicated that it had a slight effect. To assess the teaching type, 62 respondents (51.67 percent) believed that it had a strong effect, and 33 respondents (27.50 percent) thought that teaching type could slightly affect the students’ final result (Table 41).

In this respect, graduates were asked to express their views on the reasons contributed to students’ better results in the final year than the first three years. Ninety-six graduates (80.00 percent) either agreed or strongly agreed that the reason for the
better result was the adoption of the semester system in the final year. If the semester system has been adopted to encompass the four years spent in the faculty, the general performance might be improved. The percentage of respondents who either strongly agreed or just agreed to the above statement constituted 89.17 percent (107 respondents). The percentage of graduates who expressed their agreement or strong agreement to the statement that, the better results in the final year were due to the option and enjoyment of each student to his respective subject was 92.3 (108 respondents).

Fifty-eight graduates (48.33 percent) agreed that if the option system has been adopted in the semi-final year, the final result of students would be improved whereas the same statement was strongly supported by 48 graduates (40.00 percent).

The statement “if the courses are divided with further subdivisions and separate examinations, the students’ results would be improved” was supported by 94 graduates (78.34 percent). Table 44 shows the obtained results concerning the above five statements.
Table 43. The graduate's opinion about the effectiveness of the five aspects affecting the general final results.

<table>
<thead>
<tr>
<th>Factors</th>
<th>Strong effect</th>
<th>Slight effect</th>
<th>No effect</th>
<th>No opinion</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No.</td>
<td>Percent</td>
<td>No.</td>
<td>Percent</td>
</tr>
<tr>
<td>Individual effort</td>
<td>109</td>
<td>90.00</td>
<td>8</td>
<td>6.67</td>
</tr>
<tr>
<td>Semester system</td>
<td>59</td>
<td>49.17</td>
<td>54</td>
<td>45.00</td>
</tr>
<tr>
<td>Option system</td>
<td>72</td>
<td>60.00</td>
<td>36</td>
<td>30.00</td>
</tr>
<tr>
<td>Teaching load</td>
<td>41</td>
<td>34.17</td>
<td>39</td>
<td>49.16</td>
</tr>
<tr>
<td>Teaching type</td>
<td>62</td>
<td>51.67</td>
<td>33</td>
<td>27.50</td>
</tr>
<tr>
<td>Description</td>
<td>Strongly agree</td>
<td>Agree</td>
<td>Disagree</td>
<td>Strongly disagree</td>
</tr>
<tr>
<td>-----------------------------------------------------------------------------</td>
<td>----------------</td>
<td>-------</td>
<td>----------</td>
<td>-------------------</td>
</tr>
<tr>
<td>Students in the final year usually score better results than the last three years because of the semester system being adopted in the final year</td>
<td>47</td>
<td>39.17</td>
<td>49</td>
<td>40.83</td>
</tr>
<tr>
<td>It is also due to the option system and each student enjoys his respective subjects</td>
<td>38</td>
<td>48.33</td>
<td>53</td>
<td>44.17</td>
</tr>
<tr>
<td>If the semester system has been adopted to encompass the four years spent in the faculty, the general final result will be improved</td>
<td>31</td>
<td>42.30</td>
<td>36</td>
<td>46.57</td>
</tr>
<tr>
<td>If the option system has been practiced from the semi-final year, then the final result will be improved</td>
<td>38</td>
<td>46.00</td>
<td>38</td>
<td>48.33</td>
</tr>
<tr>
<td>If the courses are divided with further subdivisions with separate examinations, the students results will be improved</td>
<td>38</td>
<td>31.57</td>
<td>36</td>
<td>46.57</td>
</tr>
</tbody>
</table>
4. X General Views About life in the Faculty of Agriculture

1. Extra-curricular activities

The graduates were given the chance to mention in general terms the things that they like in the Faculty of Agriculture, in the first question, and the things that they disliked in the second question. In answering the first question, 65 respondents (34.17 percent) mentioned the social life in Shemelat, and 27 respondents (22.50 percent) pointed out things that are related to curriculum (mainly practical work, tours and field training). Regarding the second question, 38 respondents (31.67 percent) mentioned curriculum-related things such as examinations and 38 respondents (25.35 percent) indicated that bad services in the faculty. More details of graduates responses to the first and second questions are shown in Table 45 and Table 46 respectively.

2. Suggestions for Faculty Improvement

This is the last question in the questionnaire to which the graduates responded. They gave suggestions for the faculty improvement such as courses to be added, more concern to be given to practicals, learning methods
to be improved, changes in forms of organization of existing methods, training, facilities, ideas etc. In response, 65 graduates (34.17 percent) suggested more concern to be given to the practicals, the same percentage of the graduates (54.17 percent) proposed having more consideration to the field training and tours, 24 respondents (20.00 percent) recommended improvement of teaching facilities. Table 47 shows details of the graduates suggestions for faculty improvement.
Table 45. Aspects disliked by the graduates.

<table>
<thead>
<tr>
<th>Aspect</th>
<th>Number respondents</th>
<th>Percentage of respondents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Curriculum (mainly examinations and theory)</td>
<td>38</td>
<td>31.67</td>
</tr>
<tr>
<td>Bad services</td>
<td>28</td>
<td>23.33</td>
</tr>
<tr>
<td>Bad behaviour of students (mainly political behaviour)</td>
<td>13</td>
<td>12.50</td>
</tr>
<tr>
<td>Faculty size</td>
<td>6</td>
<td>5.00</td>
</tr>
<tr>
<td>Blank</td>
<td>33</td>
<td>27.50</td>
</tr>
<tr>
<td>Total</td>
<td>120</td>
<td>100.00</td>
</tr>
<tr>
<td>Aspect</td>
<td>Number of respondents</td>
<td>Percentage of respondents</td>
</tr>
<tr>
<td>--------------------------------------------</td>
<td>-----------------------</td>
<td>---------------------------</td>
</tr>
<tr>
<td>Social life in Soweto</td>
<td>65</td>
<td>54.17</td>
</tr>
<tr>
<td>Curriculums (mainly practicals, tours and field training)</td>
<td>27</td>
<td>22.91</td>
</tr>
<tr>
<td>Site</td>
<td>11</td>
<td>5.17</td>
</tr>
<tr>
<td>Blank</td>
<td>17</td>
<td>14.17</td>
</tr>
<tr>
<td>Total</td>
<td>120</td>
<td>100.01</td>
</tr>
</tbody>
</table>
Table 47. The graduates' suggestions for faculty improvement.

<table>
<thead>
<tr>
<th>Area of suggestion</th>
<th>Number of respondents</th>
<th>Percentage of respondents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Improvement of lecturing methods and teaching abilities</td>
<td>5</td>
<td>4.17</td>
</tr>
<tr>
<td>More concern to be given to practicals</td>
<td>63</td>
<td>34.17</td>
</tr>
<tr>
<td>More field training and tours</td>
<td>65</td>
<td>34.17</td>
</tr>
<tr>
<td>Improvement of teaching facilities</td>
<td>24</td>
<td>20.00</td>
</tr>
<tr>
<td>Specialization to start from semi-final year</td>
<td>8</td>
<td>6.67</td>
</tr>
<tr>
<td>Application of the course unit system</td>
<td>5</td>
<td>4.17</td>
</tr>
<tr>
<td>Addition of some departments</td>
<td>4</td>
<td>3.33</td>
</tr>
<tr>
<td>Conducting seminars</td>
<td>2</td>
<td>1.67</td>
</tr>
<tr>
<td>Blank</td>
<td>24</td>
<td>20.00</td>
</tr>
</tbody>
</table>
COMPARATIVE ANALYSIS OF DATA

This study addresses itself to the analysis and assessment of the Faculty of Agriculture curriculum and its relevance to the graduates' needs. As mentioned, Tyler sets certain principles for developing any curriculum or plan of instruction. These principles are as follows:

1. Educational objectives to be sought by the school.
2. Learning experiences to attain these objectives.
3. The effective organization of learning experiences.
4. Evaluation.

If we review the data obtained within the context of Tyler's model, the following discussion could be drawn:

3.1 Objectives of the Faculty of Agriculture

The current objectives of the B.Sc. programme in the Faculty of Agriculture are as follows:
The main objectives are to attempt to produce young men and women who are:

1. Adequately aware of the underlying scientific and social principles governing agriculture.

2. With good measure of competence in their grasp of the principles and practices of crop and animal production.

3. Developing a special interest in one agricultural science, though by no means exclusively specializing in it."

- It is obvious that the educational programme in the Faculty of Agriculture has a clear and well stated objectives, and the statements are in form of changes to take place in students patterns of behaviour.

- The objectives had been formulated, as mentioned earlier, in (1964) by the "subject specialists" or instructors in the faculty. So studying of learners themselves is essential to evaluate the objectives.

- Data concerned with the graduates' needs and interests towards the faculty enrollment (Table 24)
showed that more than half of the graduates (52.93 percent) believed that having agriculture as a career to make a living out of it, was the first reason for their enrollment. About 27 percent stated that their interest towards enjoying scientific findings and theories made them enroll in the faculty, and only 5 percent expressed their interest of being agricultural engineers. On the other hand, data dealt with reasons for joining the Faculty of Agriculture (Table 23) showed that about 37 percent of the graduates enrolled in the faculty, because they were interested in agriculture as a career. Whereas the majority of the graduates (60.63 percent) stated that they joined the Faculty of Agriculture because they failed to join the Faculty of Medicine.

Although, the writer, thinks that the above needs and interests of the graduates towards the faculty’s enrollment are included in the stated objectives, but he feels that the absence of the philosophy that directs the educational policies and strategies, and other problems exist in the general education system in Sudan, have some bad reflections on the students'
needs and interests towards the university matriculation and selection of their study and future profession.

- Many educators give little attention to the present interests of students as an adequate resource for educational programmes, because one of the functions of education is to broaden and deepen the student's interest, and this is one of the objectives of the faculty's programme "Developing special interest in one agricultural science, though by no means exclusively specializing in it". This objective is assumed to be achieved by adopting the option system, which followed immediately the formulation of the current objectives. Data concerning this aspect of the study (Table 32) showed that most of the graduates (78.3%) agreed that the objective of the option system, to provide students with more time to think, read and enjoy their respective subjects, is realized.

- It is clear from the stated objectives that the Faculty of Agriculture avoided the system of exclusive specialization even in the final year. This is because the country need, as had been assessed at the
objectives formulation time (1964), was not for
specialist graduates, but Sudan is considered
among developing countries which continued to need
graduates in agriculture with a fairly broad back-
ground. Consequently the structure of the under-
graduate courses had been remodelled towards the
"group-specialization" design and the "single-
discipline" specialization was avoided, and had been
left, to the post-graduate level. Sudan needs, today
actually requires to be assessed and the existing
objectives need to be re-examined accordingly. Such
review of objectives becomes essential with the
increased importance of the specialized graduates for
the following factors:

1. There is a tendency towards specialization
   in agricultural production.

2. High demand for research and post-graduate
   studies, due to the expansion in agricultural
   schemes during the 5th and 6th year plan.

3. The importance of teaching as an agricultural
   job became clear after the establishment of
the new agricultural colleges in the country. These colleges, in addition to the existing agricultural institutions are depending greatly on the faculty’s graduates to join staff.

5.2 Selection of Learning Experiences

The parameter taken in this study to evaluate the selection of learning experiences in the Faculty, is the satisfaction degree of the graduates’ educational needs with the faculty’s programme. Data concerned with this aspect of study (Table 22) showed that 74 percent of the graduates indicated that the programme met some of their needs. This means that the graduates were partially satisfied with the B.Sc. programme and so the selection of learning experiences in the Faculty might not have contributed to their satisfaction.

The main factor affecting the learning experience of students is the effectiveness of teaching methods used. Data dealt with this aspect (Table 27) showed that main teaching methods used by the faculty were lectures and practicals, whereas other methods such as
tours and field training were used with less intensity. The faculty use to these teaching methods is mainly coincident with the graduates preference, as about 74 percent of them supported the lecture method as the first rank and about 72 percent put the practical method in the second rank. Tours method as the third rank was advocated by 23.33 percent of the graduates, when they were asked to order the teaching methods they came across in the faculty according to the learning experiences they gained (Table 28). Probably other methods such as seminars, learning by doing, educational films etc. had not been effectively used during their educational programs, and accordingly they left bad experience with the graduates. This is because it is well known that other teaching methods which employ two or more senses and students get involved should be more effective than the lecture method. Lecture as a main teaching method in the faculty is greatly affected by the style of lecturing practiced in the faculty. Data concerned with this aspect (Table 29) showed that a good majority of the
graduates (68.33 percent) preferred the style of lecture which enables students to digest, comprehend the material and take notes. About 17 percent preferred giving out handouts at the end of the lecture, and those who preferred dictation style constituted only 5.5 percent. Moreover, an overwhelming majority (90.83 percent) believed that dictation contributed to the absence of students from lectures. Those who were absent used to copy down whatever they missed from their colleagues and consequently class comprehension and digestion have no room for the absentees. The ideal lecture style, which preferred by students might improve the teaching abilities of instructors. These teaching abilities, as seen by the graduates, were good and adequate in 46 percent rated them as good and 35 percent believed that they were adequate (Table 37). The effectiveness of teaching methods in the faculty is also affected by the inadequacy of the teaching facilities. Table 38 showed that about 30 percent of the graduates believed that laboratories and classroom as teaching facilities in the faculty
the establishment of new buildings for the library in 1978.

5.3 Organization of Learning Experiences

The effectiveness of organizing the learning experiences can be explained by evaluating the factors that are assumed to affect this organization, namely the option and semester system.

a) The option system

It is previously mentioned that most of the graduates (78 percent) agreed that the option system provided students with more time to think, read and enjoy their respective subjects. Also, Table 34 showed that a considerable portion of the graduates (70 percent) selected their major subjects because they liked it as a science.
To confirm this more, data from Table 33 is derived to show that graduates had more interest, more attendance, more library visits, more teacher relationship and more homework at the final year, whereas the option system is applied, and their supplementary and the teaching load were decreased. This means that the option system has a good effect in improving the interest and studying efforts of the students.

It becomes obvious from the above data, that the option system realized its objectives and helped the effective organization of the learning experiences in the faculty. However, more improvement of the sequence and continuity of the programs is assumed to be achieved by adoption of this system from the semi-final year. About (88 percent) of the graduates supported this organization (Table 31).

b) Semester system

Most of the graduates (94 percent) believed that the semester system had an effect on the students’ results (Table 43). This effect is confirmed by data derived from Table 44 whereas (30 percent) of the
graduates thought that the students usually score better results in the final year, because of the semester system adopted in the final year. They also believed (89 percent) that more improvement of students' results would be achieved by adopting the semester system to encompass the four years.

It is clear that the purpose of the semester system, to reserve time for students to revise and read throughout the year and hence improve the students' results, has been achieved and helped effective organization of the courses units in the faculty. However, more subdivisions of courses i.e. course unit system could give better results. This system was supported by a significant majority of respondents (78.34 percent).

To a reasonable degree, the writer thinks, that the learning experiences in the Faculty of Agriculture are well organized to achieve the stated objectives of the faculty programme.
5.4 Evaluation

Faculty of Agriculture uses examinations of three hours (mainly theory with little percentage of practical) as a main evaluation method to assess the students' performances and to determine to what extent the educational objectives are being realized by the programme. When the graduates were asked whether this evaluation method was fair to assess their performances, 47.5 percent of them indicated that it was fair enough if more consideration was given to the practical side. 32.5 percent believed that examination method was not fair at all, and only 12.5 percent of the graduates who thought that it was fair enough to assess their efforts (Table 4).

In spite of the clear defects which appear in the examinations method as appraisal of changes taking place in student's behaviour, but it is well known that examination is the only practicable method with the huge numbers of students and limited resources of staff members in the faculty. It is because of this
reason, the dissertation, a good method of training and assessment, was cancelled in 1972. The faculty at that time proposed the full use of the practical hours, as a substitution to the dissertation method. This means more consideration has to be given to the practical side in the examination, as nearly half of the graduates believed and accept examination as a fair evaluation method, only under this condition.

In addition, to the examinations method, the follow-up study included the following parameters for the evaluation of the curriculum.

a) Satisfaction of the graduates educational needs

It is mentioned, that the graduates of the faculty (74 percent) believed that the educational program in the faculty met some of their needs. This means that the Faculty of Agriculture has partially succeeded to satisfy the graduates' educational needs. The partial dissatisfaction of students' educational needs could be attributed to some factors as follows:

1. The current objectives of the faculty, formulated in 1964, could have contributed
to the partial dissatisfaction, as they exclusively avoided the "single-discipline" specialization.

2. Selection of learning experiences did not contribute fully in satisfying the needs of the graduates in relation to:
   - Insufficiency of practical work and field training.
   - Partial inadequacy of classrooms and laboratories as teaching facilities.

3. The sequence of organization of learning experiences could be more improved by adoption of the option system from the semfinal year. This arrangement in addition to the implementation of the course unit system might increase the satisfaction of students' educational needs.

B. Relevance of the curriculum to the actual job situation.

1. The majority of the graduates (35 percent) believed that their jobs were partially related
to what was studied and need more skills and more related information. About 27 percent thought that their jobs were related to the curriculum and both theory and practical components were suitable (Table 26). The curriculum, as appeared, has been more or less related to the graduates' jobs, even though extra knowledge and training need to be offered.

2. Concerning the graduates' opinion about relevance of the option courses offered in the final year to their jobs, Table 35 showed that 40 percent of the graduates believed that their jobs were very related to the option courses.

3. Comparing the percentage of graduates who described the curriculum as so related to their jobs (27 percent) with regard to the percentage of graduates who thought that the option courses were very related to their jobs (40 percent), we can say that some improvement...
in the relationship between the job and curriculum is realized by adopting the option system in the final year.

4. More development of this relationship can be achieved by practicing the option system from the semi-final year, provided that such organization enables students to acquire skills and related information needed for their jobs.

5. An important factor assumed to contributed the job-curriculum relationship, is the number and nature of options in the faculty, in relation to the field work availability. Data concerned with this aspect (Table 36) showed that about 40 percent of the graduates believed that number of options in the faculty is quite suitable and cover all types of work available. However, the percentage of graduates who either want to increase, or decrease the number, or replace some options by others is almost 50 percent, i.e. there is an agreement on the review and rearrangement of options number in the faculty.
6. Hence, it is important however to consider reestablishing the department of extension which was closed in 1972, since the Ministry of Agriculture has no important department under this name, while big irrigated schemes like Gezira and Soba have departments of extension. Yet the essential factor in the selection of options is the availability of the related work.
The Faculty of Agriculture, University of Khartoum, being the main educational institution for graduating B.Sc.(Agric.) degree holders in Sudan, passed through many developmental stages since its inception in 1939. The first formation was School of Agriculture which changed later to University College of Agriculture and finally transformed into Faculty of Agriculture with full university status in 1958.

The objectives, structure, and instructional content of the faculty during the different developmental stages were always subject to a continuous change and review according to the country agricultural needs. The last major revision and reform of the objectives was undertaken in 1964 followed by application of the most important educational experience during the history of the faculty which is the implementation of the option system. This profound change in the faculty curriculum was due to the change occurred in the country need which required in addition to
having general agricultural officials, some degree of specialization for research workers and post-graduation study.

This study was designed to evaluate the current objectives, structure, and courses content of the faculty, through the assessment of performance, views and impressions of its graduates. Such a follow-up study is thought to be important to evaluate pros and cons of the agricultural educational programmes of the country in order to implement necessary improvements.

Procedure

The study population was the group of students who graduated between 1975 and 1980. The selection was dictated by the most recent change in the curriculum, and difficulties in securing employment at the data collection time. The total number of graduates constituting the population of study was 938.

Those graduates were classified by different parameters. The most two important of these were the current field distribution of graduates and their
years of graduation. Those parameters considered to
be as quota controls for the quota sampling method
which was deemed most appropriate for the study as it
permitted non-random selection within the strata. A
sample size of 130 was taken from different graduation
years and types of jobs.

The data collection instrument was a two-part
questionnaire of (43) questions. The questionnaire
was aimed to collect information about the graduates' job situation and its relevance to the curriculum in
the faculty, i.e., objectives, learning experiences,
organization of the learning experiences and evaluation
methods used.

The questionnaire was administered by the researcher
who found all the needed cooperation from the graduates' sample. The forms were then coded and answers were
tabulated. The data was then processed and the follow-
ing findings were obtained.

Findings

1. The graduates' experience

a) The graduates of the Faculty of Agriculture
were distributed in their work, all over the Sudan, in different agricultural schemes, departments, research and teaching institutions. Consequently, the graduates were dispersed among the rural and urban areas. The number of graduates who work at rural areas were found to be less than 50 percent. Also less than half the graduates preferred to work in urban areas. Most of the respondents were working at the sites which they preferred, although a good portion of the graduates favoured urban sites but with official visits to the rural areas. Faculty site (being at an urban area) was found to have no influence on the graduates preference sites, especially those who work in the rural areas, as it was assumed. The reason for this, as the author believes, is the recent development of the Sudanese rural areas and the difficulties faced by urban people in their day to day lives.

b) The most pressing problem faced by the graduates, was the poor salaries they received. It was found that this was the main cause for changing the jobs or the employers since what they gained was not enough to satisfy their basic needs.
c) Although the graduates' job performance was found to be good yet it could be significantly improved if the pressing problems are solved. Most of the respondents who changed their jobs, because of these difficulties, were on the opinion that their previous job performance was better than the recent one.

d) The majority of the faculty graduates indicated that they had social activities from which their communities benefited; on the other hand, the university life, provided by the faculty, was found to contribute less to the self-independence behaviour.

e) The percentage of graduates who received in-service training was found to be nearly less than 50 percent. This is a reasonable percentage since in-service training is becoming very important to equip the employees for better performance. The graduates felt that their chances for post-graduate training were fair enough compared to graduates from other faculties or disciplines. Different types of post-graduate training were found to be needed for different jobs of the graduates.
3. **Graduates satisfaction with the faculty programme in terms of its relevance to their job situation**
   a) The Faculty of Agriculture graduates believed that the programme to which they were exposed in the faculty met some of their educational needs.
   b) The graduates thought that their jobs were partially related to what was offered in the faculty and more practical training and related information were needed. However, a few of them believed that their jobs were so related to their faculty training.

4. **Reasons for enrollment in the Faculty of Agriculture**

   Having agriculture as a profession to make a living out of it was found to be the main factor that made graduates enrol in the Faculty of Agriculture. Moreover, most of the students enrolled in the Faculty because they did not have the chance for the Faculty of Medicine and the Faculty of Agriculture was the alternative.

5. Most of the graduates preferred that the selection for the Faculty of Agriculture be made from the preliminary
year than from the secondary schools. A good majority were on the opinion that their level of comprehension increased significantly in the Faculty of Agriculture, than in the preliminary year. They also considered English language as a medium of instruction to be a real problem in the first few weeks but students can cope with it afterwards.  

5. The lecture as a teaching method was considered to be good whereas just about half of the respondents evaluated the practicals as fair. The graduates preferred the type of lecture which enables them to comprehend and take notes and strongly achieved that dictation contributed to the absence of students from classes.  

6. The five-years B.Sc. programme was favoured by the majority of the graduates but they preferred the two-year system of specialization than the one-year system.  

7. Graduates' attitudes towards implementation of the option system in the faculty  

a) The option system was supported by the majority
since it provided more time for students to concentrate on the concerned subjects of specialization. Besides, the graduates had more interest, more library visits, more teacher relationship, more attendance and practical work in the final year, but as far as the supplementaries and teaching loads there were a decrease.

b) The faculty's graduates differed in their opinion towards the number and the nature of options offered in the faculty. There were those who supported an increase and others who advocated a decrease in number and a third party who wanted to keep the same number but to replace some options by others. There was an agreement on periodical review and adjust of options to meet the changing job needs.

8. **Graduates' Impressions about Instructors and Teaching Facilities**

   a) The graduates of the faculty believed that their instructors' teaching abilities were almost good and adequate, i.e. nearly half of them described it as good, and some portion thought they were adequate.
b) Classrooms, laboratories as teaching facilities were described as partially adequate, whereas library facility was almost adequate.

9. The assessment of students performance as seen by the graduates

a) Although the students' frequency of attendance in classes was found to be regular yet they indicated that they revised their lessons from time to time and not throughout the academic year.

b) Examinations as a mean of assessing abilities was evaluated as fair provided that more consideration has to be given to the practical part of the examination.

b) The existing formula for B.Sc. evaluation in the faculty, i.e., 40% for efforts in the first three years, and 60% for the final year, was the most accepted formula by the graduates.

d) The majority of the graduates were on the opinion that students usually perform well and obtain better results in the final year. They strongly believed that the students' performance could generally
be improved if the semester system is promoted to the course unit system and the option system is employed from the semi-final year.

10. The social life in Shamiyat was favoured by the faculty graduates while examinations and the theoretical part of the programmes were the most disliked things.

To improve the Faculty of Agriculture, the following were recommended by the graduates:

1. More practical classes.
2. More field training and tours.
3. Improvement of teaching facilities.
CHAPTER 7

CONCLUSIONS AND RECOMMENDATIONS

The following are the conclusions reached by this study as the result of curriculum evaluation:

1. The curriculum in the Faculty of Agriculture has partially satisfied the graduates' educational needs for their current occupations.

2. The curriculum is found to be partially related to the actual jobs of the graduates, and more practical training and related information were found to be needed for more tied relationship.

According to Tyler's philosophy of curriculum development, the above aspects could be related to the following factors:

1. The Faculty programme is found to have clear and well stated objectives, yet these objectives could be contributed to the partial dissatisfaction of graduates educational needs as they exclusively avoided the "single-discipline" specialization. The present needs of the country demand more specialization for the following reasons:
- There is a high demand at present for research and post-graduate studies than before.

- There is an increase in the number of graduates who are involved in teaching agriculture as a profession.

- There is a tendency towards specialized agricultural production.

2. Selection of learning experiences in the faculty, did not contribute fully in satisfying the needs of the graduates in relation to:

- Insufficiency of practical work and field training.

- Partial inadequacy of classrooms and laboratories as teaching facilities.

3. The selected learning experiences in the faculty, were found to be effectively organized and implemented by adoption of the option and semester systems which by increasing the interest and studying efforts of students, provide continuity, sequence and integration of the programme. Yet,
the sequence of organization of the learning experiences, could be more improved by adoption of the option system from the semi-final year. This arrangement, in addition to the implementation of the course unit system, might increase the satisfaction of students' educational needs and give more improvement to the curriculum-job relationship.

Based on the research findings and conclusions, the writer would put forth the following recommendations:

1. The Faculty of Agriculture needs to review its current objectives formulated in 1964 for the following factors:

   - The continuous changes taking place in the sector of agriculture in Sudan might require revising the faculty objectives now and then.

   - The question of unemployment confronting the faculty graduates, also requires revision of the objectives.
The remarkable increase of female students enrollment in the Faculty of Agriculture, with their percentage reaching almost 50 percent, might require the introduction of some relevant studies such as home sciences used to be offered in the past.

2. Lecture as a method of teaching is still dominant and preferred by the students, yet this method could be improved in a way as to contribute more to the students comprehension and involvement.

3. More practical work and intensive field training could be incorporated as an integral part when selecting the learning experiences.

4. Support for adequate classrooms and laboratories as teaching facilities is of utmost importance.

5. More care has to be given to the practical aspects with regard to examinations. This would encourage class attendance and would make students more ready to accept the examinations as a more reliable criterion for evaluating their efforts.
6. It is recommended that the faculty introduces the option system, adopted in the past, in the semi-final year and continues in the final year. Such an arrangement is expected to guarantee the following:

- Continuity and enhancement of the programme by increasing the student’s academic interest and effort.
- Closer relationship and relevance with regards to studying and practicing.

7. The adoption of semester system leading to adoption of course unit system is favoured by the graduates and thus its implementation might help in enriching the programme. This recommendation is in line with the recommendation suggested before by the Committee of Academic Reform.

8. Revision and re-arrangement is thought to be necessary for numbers and nature of options in the faculty so as to relate the programme to the actual job situation.
9. An introduction of the extension option, which was suspended in 1972 might be demanded for the fact that many extension units are established in the country.

10. Since there is a strong tendency towards minimizing training abroad and for tying up the postgraduate training programme with the existing local problems, the faculty is recommended to give more attention to the postgraduate training within its activities.
Bibliography


Department of Statistics, Preliminary Results of the Population Census, 1983.


Please fill in:

Name:
Employment site:
Graduation time:

Questionnaire

General instructions:
1. Please answer all questions whenever possible.
2. Please make a tick (✓) against your response or fill in the blank as necessary.

Section(1)

1. Which of the following describes your job site?
   a) Urban area
   b) Rural area
   c) Urban area but with some official visits to rural area.

2. Which of the above sites (in question 1) you prefer to work in (put a letter only).

3. Do you think that the Faculty of Agriculture, being located in (an urban area) has any influence on your previous preference.
   (a) Yes       (b) No       (c) I don’t know

4. Did you have any social activities in the Faculty of Agriculture that you think your community can benefit out of it.
   (a) Yes       (b) No
5. The University life you have had did not teach you how to depend on yourself (self-reliance), do you agree?
   (a) Agree   (b) Disagree   (c) No opinion

6. Which of the following reasons encouraged you most to join the Faculty of Agriculture.
   a) I was not selected to the Faculty of Medicine and had no interest in the other alternatives.
   b) I was attracted by the living conditions in Shambat.
   c) I was interested in agriculture as a career.
   d) Most of my friends were in agriculture.
   e) Others (explain).

7. Selection of students to the Faculty of Agriculture used to be from the Faculty of Science and now many of the students are taken from the secondary schools. Which of these systems you think is fair?
   a) Selection from secondary schools.
   b) Selection from Faculty of Science.

8. Was your understanding and comprehension levels of both theory and practical increased when you came to the Faculty of Agriculture compared to what in the preliminary year?
   a) Increased very much
   b) Not much increased
   c) No increase.

9. How do you rank your job performance?
   a) Very good   b) Good   c) Not bad
   d) bad   e) Very bad
10. Did you change your job? a) Yes  b) No

11. If the answer is yes, please check the reason(s) that contributed to change your job. Mark the statement which best describes your case.
   a) Financial reasons
   b) Reasons related to nature of work and interest.
   c) Academic reasons (e.g. being an researcher or teaching assistant).
   d) Social reasons (e.g. hate to live in rural area).
   e) Administrative problems.
   f) Others (explain).

12. Comparing your recent job performance with the previous one, which one you think is better?
   a) The recent job performance.
   b) The previous job performance.

13. When you first joined the Faculty of Agriculture you had actually some needs and interests you would like to satisfy, please check the statements that express your needs.
   a) To get a degree in agriculture and make a living out of it having the agriculture profession as a career.
   b) Graduation from the faculty means a university degree which leads to respect and prestige within the society.
   c) To satisfy my interest of enjoying scientific findings and theories.
d) Enjoy being an agriculturist e.g. agric. inspector, horticulturist etc. Others (specify).

e) 

f) 

g) 

14. Please put the above statements you have selected or added in order according to their importance (put the letter only).

<table>
<thead>
<tr>
<th>Needs or interest</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
</tr>
</thead>
</table>

15. Please put the appropriate expression against the need or interest in the above table (put the letter only).

a) Satisfied  
b) Partially satisfied  
c) Not satisfied.

16. Please check the problems that you have faced in your work.

a) Financial problem because of the poor offer.

b) Lack of interesting social relations and cultural activities similar to that in the Faculty.

c) Administrative problems caused by bases e.g. (bankers).

d) Others (explain).

17. Did you receive any sort of training after graduation.

a) Yes  
b) No.

18. Check the statement that describes in your opinion, the opportunity of training of agricultural graduates compared to the graduates of other faculties and institutes in the country.

a) Very good  
b) Good  
c) Fair  
d) Bad  
e) Very Bad
19. Considering the type of training received by the agriculturists, please check the best statement that expresses your opinion about the type of training needed for your job.
   a) My work needs extra academic study; therefore post graduate study will improve it.
   b) My work needs more practical skill and I think short training courses is better.
   c) B.Sc. training is quite sufficient and no need for more training.
   d) Post graduate study with course unit system is the best type of training that suits my job.

20. Please select the statement that best describes your job in relation to your study in the faculty.
   a) My job is so related to what was studied and both the theory and practical components are quite suitable.
   b) The job is too complicated and needs extra theoretical basis and information.
   c) My job is partially related to what was studied in the faculty and it needs more practical skills and more related information.
   d) My job is not of a scientific nature and not necessarily need a B.Sc. graduates. I believe a secondary school graduate could perform well.
   e) My job has nothing to do with my studying in the Faculty of Agriculture.
   f) Lack of the job itself.

21. Did the educational experience you had in the Faculty of Agriculture satisfy your education needs (check only one statement).
a) Did not satisfy my needs at all.
b) Satisfied some of my needs.
c) Satisfied most of my needs.
d) Satisfied all or nearly all of my needs.

Section (2)

23. What is your major subject?

24. How do you judge the relevance of the option courses you had and the type of work you are doing?
   a) Very related  b) Slightly related  
   c) No opinion     d) Not related

25. In selecting the major subject, which of the following criteria you did take into consideration (check only one).
   a) Because I get higher marks in it.
   b) Because I like it as a subject.
   c) Because I feel it is needed by the country.
   d) Because there are better opportunities of work in this field.

26. Please check the column which expresses your opinion of each aspect in the final year compared to the first three years.

<table>
<thead>
<tr>
<th></th>
<th>1. Increase</th>
<th>2. Still</th>
<th>No Decrease</th>
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<tbody>
<tr>
<td>Interest</td>
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<td>Attendance</td>
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<td>Library visits</td>
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<tr>
<td>Teacher relationship</td>
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<td>Home work</td>
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<td>Practical work</td>
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<td>Teaching load</td>
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<td>Supplementary</td>
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</table>


26. Consider the nature and number of options in the faculty in relation to the field work available. Check the statement which best describes your opinion.
   a) Number of options is quite suitable and covers all types of field work available.
   b) Number of options is not enough and there is a need to replace some options by others to meet the field requirements.
   c) Number of options have to be minimized and adjusted to the type of work available.

27. The option system when had been introduced in the faculty, was assumed to provide more time for students to think, read and enjoy their respective subjects. Do you agree?
   a) Strongly agree  b) Agree  c) Disagree  d) Strongly disagree  e) No opinion

28. If the faculty decided to reserve more year for specialization i.e. semi, and final year reserved for specialization, do you agree?
   a) Strongly agree  b) Agree  c) Disagree  d) Strongly disagree  e) No opinion

29. Do you think that examinations of three hours (mainly theory with little percentage of practical) was fair to assess your performance?
   a) It was fair enough
   b) It was only fair on the semester basis which relieves the tension of examinations very much.
   c) It would have been fair if more consideration had been given to the practical side.
   d) It was not fair at all.
30. Given the following formulae for assessing the final result, check the formula that you agree with.
   a) 50% first three years; 50% final year.
   b) 40% first three years; 60% final year.
   c) To be taken only from the final year.
   d) 25% for each year.
   e) Other (explain).

31. Considering the factors affecting the general final result, check the column which best expresses your opinion.

<table>
<thead>
<tr>
<th>Factors</th>
<th>Strong effect</th>
<th>Slight effect</th>
<th>No effect</th>
<th>No opinion</th>
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</thead>
<tbody>
<tr>
<td>Individual effort</td>
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<tr>
<td>Semester system</td>
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<td>Option system</td>
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<td>Teaching load</td>
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<td>Teaching type</td>
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</table>

32. Please put one of the following categories which best describes your opinion about the classrooms, library and laboratories in the faculty.
   a) Completely inadequate
   b) Partially inadequate
   c) Adequate
   d) Very adequate

<table>
<thead>
<tr>
<th>Classrooms</th>
<th></th>
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</thead>
<tbody>
<tr>
<td>Library</td>
<td></td>
</tr>
<tr>
<td>Laboratories</td>
<td></td>
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</tbody>
</table>

33. How do you rate the faculty use of the following methods (check one rating for each method).
<table>
<thead>
<tr>
<th>Method</th>
<th>Not used</th>
<th>Poor</th>
<th>Fair</th>
<th>Good</th>
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</thead>
<tbody>
<tr>
<td>1. Lecture</td>
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<td>2. Practicals</td>
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<td>3. Seminars</td>
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<td>4. Working in group</td>
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<td>5. Guest speakers</td>
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<td>6. Tours</td>
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<td>7. Educational films movies</td>
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<td>8. Assignments</td>
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<td>9. Tests</td>
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<td>10. Learning by doing</td>
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<td>e.g. ploughing</td>
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<td>11. Dissertation</td>
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34. Please rank the above teaching methods according to your preference of learning experience you gained throughout your 3rd yr. programme (put numbers only).

<table>
<thead>
<tr>
<th>a</th>
<th>b</th>
<th>c</th>
<th>d</th>
<th>e</th>
<th>f</th>
<th>g</th>
<th>h</th>
<th>i</th>
<th>j</th>
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</table>

35. Please check the column which best expresses your opinion with each of the following statements:

<table>
<thead>
<tr>
<th>St. agree</th>
<th>Agree</th>
<th>Disagree</th>
<th>disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>a) Students in the 3rd year usually score better results than the first three years because of the following:</td>
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<tr>
<td></td>
<td>Agree</td>
<td>Disagree</td>
<td>St. agree</td>
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<tr>
<td>i) The semester system being adopted in the final year</td>
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<td>ii) Because of the option system, each student will enjoy his respective subject</td>
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<tr>
<td>b) If the semester system has been adopted to encompass the four years spent in the Faculty of Agriculture, the general final result of the faculty will be improved</td>
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<tr>
<td>c) If the option system has been practiced from the 2nd final year, then the final result will be improved</td>
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<tr>
<td>d) If the courses are divided into further subdivisions with separate examinations, the students' result will be improved</td>
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</table>

36. Which of the following words best describes your impression of the instructor's teaching abilities.
   a) Poor  b) Adequate  c) Good  d) Excellent

37. How do you judge the frequency of your classes attendance.
   a) Regular  b) More than average  c) Average  d) Poor

38. Which of the lecturing style that you think is better for your own understanding:  
   a) Dictating,
   b) Lecturing and giving handouts (Notes) at the end of the lecture,
   c) Lecturing and only give references,
   d) Lecturing in a manner that enables students to take notes.
39. Do you agree that dictating in lectures is among the factors contributing to the absence of students from the lectures.
   a) Agree    b) Disagree    c) I can't tell.

40. Which of the following statements describes your studying efforts during the year.
   a) Study and revise day by day.
   b) Study and revise from time to time.
   c) Study and revise only when there is an assignment or homework.
   d) Study and revise and even complete my lecture notes only when examinations are about to come.

41. Consider the four years usually spent in the Faculty of Agriculture after the preliminary year, do you think these four years are enough to qualify the graduates?
   a) Quite enough
   b) More than enough and need to be reduced.
   c) Not enough and need to be increased.
   d) No opinion.

42. During your study in the Faculty, how can you describe your opinion in using the English language as a medium of teaching?
   a) English language is a problem in both comprehension and expression and I prefer its substitution by Arabic language.
   b) English language is not an obstacle to study any field of science. I find it far better than Arabic language.
   c) English language as a medium of instruction is a problem but it does not go to the extent of being replaced by Arabic language since that needs translation of references and scientific terms.
   d) It is a real problem during the first weeks of the preliminary year but students usually are able to cope with afterwards.

43. Will you please mention the thing that you like most in the Faculty.
40. Will you please mention the thing that you dislike most in the faculty.

45. Do you have any suggestions for the faculty improvement such as courses to be added, practical, any learning methods, form of organization of existing methods, training, facilities ideas, etc.
هذه دراسة ت集中在 مجال التحليل الزراعي. في عام، أُجريت دراسة في جامعة مكة، بجانب البحرين، لتقييم النتائج في هذا المجال. 200 دراسة تُظهر نتائج تشير إلى تحليل وسياسات هذا النوع من النبات في السعودية، وربط ذلك بالعديد من العلميين.

كليّة الزراعة، جامعة البحرين، تشير إلى أنه في الخريجين الزراعيين. 102 من الخريجين، ما أهمية الأكبر في التنمية الإقتصادية والزراعية.

الجيل الجديد في البلاد.

الخلاصة:
- النتائج تظهر أن تحليل الزراعة في المملكة تركز على تحليل الزراعة الزراعية.
- التحليل الذي أجريت لتحديد فهارسي التشريحي من الشجاعين، تم استخدام رؤية رأسية من المناهج المتقدمة في مجالات الزراعة.
- دراسة تركز على تحليل الزراعة في البلاد.

كانت النتائج الأصلية للدراسة توضح أن تحليل الزراعة الخاص.

يُلاحظ أن الشجاعين يعبرون عن الاهتمام بالزراعة في شروط العمل المثلى. 50% كانوا يجدون ذلك، مع شيء من الشجاعين، بالتأكيد، أن التحليل الزراعي، إذا كان الهدف من الشجاعين، كان يصور بعض النتائج البائسة.

عمم، ونتيجة لذلك، يتم وضع التركيز على تحليل الزراعة في البلاد.
لا تتوفر معلومات يمكن قراءتها بشكل طبيعي من الصورة قدمت.