CHALLENGES FACING

HIGHER AGRICULTURAL EDUCATION

IN BELIZE

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INTRODUCTION

Higher education today can be considered a capital investment and is of paramount importance to the economic and social development of Belize. The University of Belize (UB) has the main responsibility for equipping individuals with advance knowledge and skills required for the continued development of Belize. It is, therefore, important for decision-makers to recognize that higher education is an important factor for development.

Agricultural Education in many developing countries faces difficult challenges. Higher agricultural education in Belize is in a period of transition which may not be widely recognized by its stakeholders. Currently, the University of Belize, which is responsible for higher Agricultural Education in Belize, is facing major challenges with its agricultural program. These challenges include but are not limited to enrollment, attrition, curriculum content, finances and linkages with other institutions.

During the period 1984 to 2000, the Belize College of Agriculture (BCA) awarded 105 Diplomas in General Agriculture and 280 Associate Degrees in Applied Science Agriculture, to its students. While the University of Belize, since it creation in the year 2000 has awarded fifty seven (57) Associate Degrees in Applied Science Agriculture. Therefore, to date, Belize’s Agricultural Institutions have awarded a total of 337 Associate Degrees in Applied Science Agriculture. i

In March 2004, the author of this document conducted a survey which focused on individuals who graduated with an Associate Degrees in Applied Science Agriculture from both the BCA and UB during the period 1997-2003. This survey revealed that of the 158 students who graduated during this period, 58% are directly employed in the agricultural sector, 22 % have or are pursuing further agricultural related studies, 14% are working in areas not related to Agriculture and about 9% are either unemployed or whereabouts unknown (Chart 1). Those employed in the agricultural sector are serving as Quarantine Inspectors, Field Supervisors, Technicians, Farm Managers, Research Assistants, Teachers, Extension Officers and Sales Agents in the both the public and private sectors.

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BRIEF HISTORY OF AGRICULTURAL EDUCATION IN BELIZE

Formal Agricultural Education in Belize started at the Lynam Agricultural College in the year 1948. This institution, up until 1971, educated Belizeans in the areas of crops and livestock production. Unfortunately, it was closed in 1971 and converted to a prison.

In 1953, the Central Farm Training School in Central Farm, Cayo District was established. The purpose of this institution was to offer in-service training to Farm Demonstrators and workshops to farmers. The training school operated as is and offered short courses to its clients up until 1977, when it was transformed to the Belize School of Agriculture.

The primary reason for the establishment of the Belize School of Agriculture was to train individuals in the field of agriculture to work as extension officers and technicians within the public service. Additionally the school of agriculture served as a venue for in-
service training of Extension Officers as well as hosting workshops, seminars, meetings and training sessions for farmers and the general agricultural public.

During its initial years, 1977-81, the institution offered a one-year certificate course in General Agriculture. In 1981, an optional second year was offered for a diploma in General Agriculture. Thereafter in 1983, the one-year certificate program was discontinued and upgraded to a 2-year diploma program. In 1986, the institution’s name was changed to the Belize College of Agriculture. However, it was not until 1989, that the College started offering Associate Degrees in Applied Science Agriculture.

Much effort has been put in place to improve tertiary level agricultural education in Belize. In 1990, a project was funded by the Canadian International Development Agency in collaboration with the Association of Canadian Community Colleges and the Belize Ministry of Agriculture to review and improve the BCA curriculum. This was done through a Technical Mission team which recommended that (a) the mandate of the institution be expanded to include pre-service, in-service and general educational programming, (b) that three (3) programming stream be introduced. Those are Vocational Agriculture Diploma, and two-year Associate Degrees in Agriculture and Natural Resource Management. Thus far, due to the birth of the University of Belize in 2000, general education courses have been included, and an Associate Degree in Natural Resources Management has been inherited.

Further changes in the area of higher agricultural education took place in August 2000, when BCA was merged with four other post-secondary institutions to form the University of Belize (UB). Within this new structure and management, it became the Faculty of Agriculture and Natural Resource (FANR). As a Faculty, it was responsible for the offering of Associate Degree Programs in both General Agriculture and Natural Resource Management. During the period 2000-03, UB-FANR granted Associates Degree in Applied Science Agriculture to 57 graduates.

In August 2003, the University of Belize went through a restructuring exercise that resulted in the Faculty of Agriculture and Natural Resources, which was responsible for higher Agricultural Education within the University of Belize to be downgraded to a
department and placed within the Faculty of Science and Technology. This phenomenon is affecting many Agricultural Faculties within Universities today.\textsuperscript{iv}

**AGRICULTURAL EDUCATION**

Agricultural Education is a complex discipline, that focuses on the integration of agricultural knowledge, skills and attitudes within an establish curriculum, where the cultivation, maintenance, sustainability and appreciation of plants, animals and the environment are stressed. Many countries refer to agricultural education as similar to extension practices or promoting field programs directed at small farmers.\textsuperscript{v} Agricultural education is closely linked with both ‘education’ and ‘agriculture’ whether working with widespread policy or instruction at the classroom level.\textsuperscript{vi}

Agriculture does not fall easily in any group of educational subjects in most formal education systems.\textsuperscript{vii} It is being seen variously as “practical”, as an applied science, or as a valuable cross-curricular linkage with no real place in any grouping. Many people view agricultural education or agriculture as dirty practical work, hence the reluctance of its adaptation into many school curriculum.

Agricultural Education is an expensive venture, especially when compared to other programs within a University setting. The resources required in order for it to be credible are expensive and funds are not easy to acquire. Many agricultural activities and operations are not commercialized due to the fact that they are utilized as a teaching tool. Therefore, income generated from farm operations, for example, is minimal despite the vast expanse of farmland. However, one way of overcoming this phenomenon is through the establishment of farming enterprises. Utilizing this method, commercial ventures can take place with students rotating through the different established enterprises, observing and participating in various field practices. A clear example of this can be seen at the Zamorano.

In Agricultural Education, as in all other organizations and institutions, its vitality depends directly upon the commitment of the administrators, faculty and staff. This has serious implications for institutional organization and management. If a training

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institutions is to contribute significantly to the progress of the society and educational system with which it is associated, as well as to student progress, it must be provided with a favorable climate for its full and continuous development. Objectives, policies and regulations should encourage the employment and effective functioning of competent personnel interested in contributing directly to progressive, constructive and orderly development. viii

Institutions should actively contribute to development activities at grass-roots level through extension, rural communication and in-service training for field staff. Institutional Directors must face up to this challenge and ensure that their institutions develop a real and close relationship with the rural community, since it is evident that the majority of their students will work with rural people. ix The 2004 employment survey indicated that 58 % of the graduates between the years 1997-2003 are employed in the Agricultural sector, of which the vast majority of them are either Technicians or Extension Officers. Based on this statistic, the Agriculture Program should include a significant component of extension and related subjects. In addition training should be community oriented, with some of the practical work being done at the village level with the full involvement of the local people (farmers).

CHALLENGES FACING HIGHER AGRICULTURAL EDUCATION IN BELIZE

There are many challenges that plague the development of higher Agricultural Education in the world today, especially in developing nations. ‘Formal agricultural education and training is essential for the production of skilled and professional individuals to serve in Belize’s agricultural sector through education, extension, research, entrepreneurship and commerce’ ix. To meet the needs of the rapid development of the Belize’s diverse agricultural sector, with its requirement for highly skilled manpower, environmental issues related to growth and rural communities plagued by poverty, it is important for the University of Belize to redefine its current programs. There are many challenges being experienced by University of Belize in connection with its agricultural program. It is clear that the present curriculum that concentrates on production agriculture is not designed to produce individuals who can
deal with the wider problems of rural development and the environment. Therefore the challenges that need urgent attention for the UB Agriculture Program are as follows:

1. Enrolment
2. Attrition
3. Linkages
4. Curriculum
5. Finances

1. Enrolment

The number of student applying to study agriculture at the University of Belize has seen a reduction since the year 2001 (chart 2). Focusing on enrollment, we first need to look at our feeder institutions. Within the country of Belize, there are currently over 40 high schools with various curriculum and program offerings. By looking at the offerings of the different High Schools, it shows that 18% (3,328 students) of the total High Schools population are enrolled in an agricultural course (chart 3).

Therefore, it is evident that agriculture is not a priority since it shows that agriculture is severely lacking in the curriculum of the various High Schools. Additionally, it seems evident that educators at the policy level do not view the teaching of agriculture as important despite Agriculture’s contribution of 12.4% to the Gross Domestic Product of our National Economy in 2002\textsuperscript{xii}.

Secondly, because agriculture is not taught or encouraged in all high schools, many students who are interested fail to matriculate. This is due to the fact that they come from schools that do not prepare them adequately in the areas of sciences, which are important foundation courses for any person pursuing an agricultural program. Therefore, only the few who received the adequate training in their respective High Schools or come from families with an agricultural background, view agriculture positively, and are successful when they apply into the program.

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Chart 2: Enrollment Figures 1995-2003

Chart 3: Agriculture Enrolment in High Schools

During the years 1995-2000, the average student enrollment at the Belize College of Agriculture was 36.6 students per year. On the other hand, enrollment for the years
2000-03 at the University of Belize is 24.5 students per year. This is a reduction of approximately 12 students per annum. The reasons for the above are the following:

a) Higher enrollment requirements.

b) The cost of the program has been increased from $300.00 per annum to $3804.00 per annum.

2. Attrition

This is another factor affecting the Higher Agricultural Education Program in Belize. As stated earlier, this can be contributed to poor science foundation that students receive while in high school, and inadequate preparation due to the fact that only 33% of the high schools in Belize offer agricultural related subjects to their students.

It is evident (Table 1 & Chart 4) that there has been an increase in the student attrition rate when comparing the BCA 95-99 and UB 2000-2001 years. The rate of attrition has increased from 26.67% at BCA to 62.5% at UB resulting in a change of 33.83%.

<table>
<thead>
<tr>
<th>School Year</th>
<th>ENROLLMENT</th>
<th>(%) GRADUATES</th>
<th>(%) ATTRITION</th>
</tr>
</thead>
<tbody>
<tr>
<td>95-97</td>
<td>37</td>
<td>56.76</td>
<td>43.24</td>
</tr>
<tr>
<td>96-98</td>
<td>35</td>
<td>68.57</td>
<td>31.43</td>
</tr>
<tr>
<td>97-99</td>
<td>37</td>
<td>64.86</td>
<td>35.14</td>
</tr>
<tr>
<td>98-2000 (BCA)</td>
<td>39</td>
<td>64.10</td>
<td>35.90</td>
</tr>
<tr>
<td>99-2001 (TRANS)</td>
<td>35</td>
<td>77.14</td>
<td>22.86</td>
</tr>
<tr>
<td>2000-02 (UB)</td>
<td>36</td>
<td>47.22</td>
<td>52.78</td>
</tr>
<tr>
<td>2001-03</td>
<td>18</td>
<td>27.78</td>
<td>72.22</td>
</tr>
</tbody>
</table>

Table 1: Attrition Rate 1995 to 2001 intakes based on enrollment

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The increase in attrition rate can be attributed to the following:

a. Inadequate science foundation received by students while in high school.

b. Relatively high program cost, when compared to what students paid at BCA, $300.00 per annum to UB’s $3804.00 per annum

c. Higher graduation requirements at UB as opposed to BCA.

![Attrition and Graduation Rates based on intake 1995-2003 classes](image)

**Chart 4: Attrition and Graduation Rates based on intake 1995-2003 classes**

3. Linkages

Linkages are intended to develop long-term, mutually beneficial relationships between institutions and organizations, as well as to achieve sustainable institutional development. Additionally linkages are important in helping institutions to constantly adjust to their environment in order to attract resources (human and financial) required to carry out their mandate. xii

The term institutional linkage is today used for any type of mutually beneficial inter-institutional relationship. The linkage concept reflects a trend away from a one-way flow of technical assistance from developed to less developed institutions or countries towards a concept of institutional partnership involving exchange for mutual benefit. It is

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also important to note that the term linkage can also be used to describe relationships at sub-institutional levels between departments, individuals, businesses and networks of institutions.

Institutions are dependent on each other for their continued development and survival. Weak linkages limit the effectiveness of educational institutions to contribute effectively to development. For its continued development, it is essential that UB’s Department of Agricultural and Natural Resources, link with its partners (extension and research), stakeholders, and other institutions locally, regionally and internationally. It is important to note that for this linkage to work, it requires all involved parties to be committed, have clear objectives, work towards a common goal, and receive benefits form the linkage relationship.

To achieve a high standard of agriculture production, Belize needs to have strong research, extension and education systems, properly linked together. Agricultural education at the University of Belize needs to be reorganized and strengthened. This can be done through involving stakeholder in a comprehensive needs analysis and thereby revising the current program and then move towards the development of new ones.

Through linkages, UB’s Agriculture Program can be improved tremendously, and the use of scarce resources can be maximized to benefit all involved parties, and the development of Agriculture within UB and the country of Belize. Additionally relevant and appropriate research can be conducted with the involvement of students to assist in solving farmers’ problems, increase agricultural production, and the development of rural communities. This in turn will contribute to poverty alleviation and the development of Belize.

4. Curriculum

Before we examine the challenges within the curriculum, we first need to look at the specific program objectives of the current agriculture program within UB. These are:
A. To promote and develop an agriculture ethos, entrepreneurship, technical knowledge and self-reliance among professionals at the tertiary level, producers and sectoral leaders.

B. To characterize the agricultural systems and services in Belize and diagnose their constraints, potentials and priority interventions for significant impact.

C. To develop, adapt, demonstrate and commercialize improved technologies and components for higher productivity, profitability and sustainability for agricultural production, agro-processing and marketing.

D. To assist agricultural research, development and training, programs by collaborating with the MAFC, producer associations, the business sector, training institutions, and national and international agencies.

The above objectives are well-intentioned, however, it will be difficult to achieve without the revision of the current curriculum. One of the problems being faced today is that the current curriculum is severely lacking in the areas of Supervised Field Experiences. Students are taught the theoretical aspects of agriculture; however, the practical applications are limited. Based on personal communications with past students and current employers, many students lack the essential practical applications required by many employers.

The current curriculum focuses heavily on production agriculture with little or no emphasis on the aspects of rural development and the environment. It is currently hinged on what was taught at the then BCA with the inclusion of general education courses. At this point, this author is recommending that UB in collaboration with its stakeholders conduct a needs assessment which will determine the direction that agriculture education should take in Belize.
5. FINANCES

The issue of finances within any organization is important, therefore the Department of Agriculture and Natural Resources at the University of Belize is no exception. Over the years, the agriculture program has seen its financial allocations in essential areas such as practical field experiences and field trips decline. This has hurt the program tremendously due to the fact that students are not able to get the necessary field experiences required of an agriculture student. Other notable areas within the total budget indicated that 93.09% of the 2003-04 budget was assigned to the payment of personal emoluments, leaving a mere 6.91% available for the operation of the program. Such vast disparities are not sustainable. Therefore, it is evident that there needs to be more financial resources appropriated for the effective operation of the Agriculture Program.

RECOMMENDATIONS

In order to overcome the challenges facing the University of Belize in the area of Higher Agricultural Education, the following are essential.

1. Conduct an agricultural needs assessment survey by utilizing a participatory approach with the involvement of stakeholders. This will definitely indicate to UB what the priority areas for agriculture within Belize are.

2. Review and upgrade the current curriculum with the involvement of stakeholders. The agricultural Program should reflect the changing needs and the demand of Belize.

3. It is important for UB to include experiential learning in appropriate off campus settings within its curriculum. This will be effective in training students since it features agricultural/rural problem situations at their origin.

4. Establish and maintain linkages with stakeholders both locally and internationally

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5. The Agriculture program must receive the necessary finances needed for its effective operation. This can be done through projects with donor institutions and organizations.

6. Promote Agriculture, Natural Resources Management and Rural development both within the formal and non-formal educational systems.

7. Assist High Schools and Primary schools with the revision of their syllabi to strengthen their science and agriculture courses.

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Adopted from BCA annual Report 1999 and UB Statistics
ii Graduate Survey March 2003 done by Alfred Serano
iv Falvey, L. (1998), Are Faculties of Agriculture Still Necessary?, ATSE Focus, No. 103,
v Finley and Price (as cited by Eck, 1995)
vi Meaders et al, (as cited by Eck, 1995)
vii Taylor 1996
ix FAO 1985
x Serano 2001 pg 9
xi Belize Ministry of Agriculture, Fisheries and Cooperative Policy Unit
xii Adrien et al 1996
xiv FANR Budget 2003-04
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