The Development of Agricultural Education in the Education System of Botswana

Keba Hulela
Lecturer
Botswana College of Agriculture,
Faculty of Agriculture
University of Botswana,
Gaborone, Botswana
E-mail: KHULELA@bca.bw

W. Wade Miller
Professor
Department of Agricultural Education and Studies
217 Curtiss Hall
Iowa State University
Ames, IA 50010 USA
Telephone: (515) 294-0895
Fax: (515) 294-0530
E-mail: wwmiller@iastate.edu

Abstract

Botswana is one of the countries in Southern Africa that at one point was largely dependent on subsistence farming based on traditional methods. Agriculture consisted primarily of growing crops and raising animals for food (National Development Plan, 1968). Swartland (1984) stated that the search for educational curriculum relevance to the Botswana way of living started in 1941 when Dumbell, the first director of education for the Bechuanaland Protectorate, proposed the introduction of agriculture into the curriculum. Agricultural education has become a component of general science in the primary school education curriculum, a compulsory subject for all junior secondary school students, a popular optional subject in senior secondary schools and a popular career followed by many tertiary institutions graduates and rural populace. Knowledge of how the teaching of agriculture started, its functions in the past and today, and how it was adopted into the current education system could be used to address the present and future of modern agricultural education, hence the need for this review. The purpose of this paper was to trace the development of agricultural education from pre-independence to the modern era of agricultural education in the secondary school system and to document the accomplishments as well as the challenges of the agricultural education program in the secondary school system of Botswana.
Introduction

Botswana is one of the countries in Southern Africa that at one point was largely dependent on local food production. The agricultural industry was predominantly traditional, characterised by subsistence farming, growing crops and raising animals for food requirements, (National Development Plan, 1968). The majority (95%) of the population relied on traditional methods of practising agriculture with low output gain per unit of production (Chiepe, 1957). The young men and boys lived at the isolated cattle posts, which was a feature of life in the country (Coles, 1985) while women remained in villages to tend soil and look after children. However, for those who attended school the curriculum was more academic with no practical subjects. Swartland (1984) stated that the search for educational curriculum relevance to the Botswana way of living started in 1941 when Dumbell, the first director of education for the Bechuanaland Protectorate, proposed the introduction of agriculture into the school curriculum. The director demanded that there be something of scientific thought, people could be encouraged to think scientifically since various sciences appeared in school syllabi. The one difficulty was that in the teaching of most of sciences there was need for expensive equipment. However there was one subject, agriculture, which was science-based and was relatively inexpensive to teach. This particular science-based subject involved the study of nature and things closely connected with the study of nature, such as agriculture that helps to make observations. Through experiments one could arrive at conclusions, test them out and learn from them. Agriculture was therefore considered a subject that was of value to education as an instrument for development (Swartland, 1984).

According to Taukobong (1984), the role played by education in the field of agriculture was of major importance if one considers the many variables that a farmer has to contend with in order to produce a good crop or raise a good beef animal. The author further noted that in order to maintain the productivity of land it was necessary to ensure that correct utilization or conservation methods were employed at all times. In order to do that, farmers needed to be educated about proper land use and conservation methods.

Today, agriculture contributes 4% to the country’s Gross Domestic Product (GDP) after the mining industry that has risen to 48% from 2% in 1966 (NDP 1995). However, agriculture still remains an important sector in the economy of the country since it provides food, income, employment and capital for the majority of the population living in rural areas. It is for this reason that the government found it necessary to consider teaching agriculture in schools immediately after 1966. Agricultural education has become a component of general science in the primary school education curriculum, a compulsory subject for all junior secondary school students, a popular optional subject in senior secondary schools and a popular career followed by many tertiary institutions graduates and rural populace. Knowledge of how the teaching of agriculture started, its functions in the past and today and how it got adopted into the current education system could be used to address the present and future of modern agricultural education hence the need for this review. The purpose of this review paper therefore was to (a) provide information on the development of agricultural education from pre-independence to the modern era of agricultural education in the secondary school system of Botswana and, (b) Document the accomplishments as well as the challenges of the agricultural education program in the secondary school system of Botswana.
Review Methodology and Data Sources

To accomplish the objectives of the study, historical research methods were utilized and it relied mainly on the utilization of secondary sources to obtain information. The sources of information include manuscripts, official records, letters, and personal interviews. The manuscripts and letters were consulted at the National archives in Gaborone while two active senior citizens who are retired teachers were interviewed as key informants between 2001 and 2002.

Agricultural education in transition

**The pre-independence (1800-1966) era.** Review of relevant literature and records revealed different accounts on the beginning of the teaching of agriculture in Botswana. The pre-independence period was the time of awareness creation through informal and formal teaching of agriculture with the intent to disseminate the idea of food production. The background of the people of ‘Bechuanaland Protectorate’ (now Botswana) motivated different interventionists such as the Dutch Missionary Society (DMS) in 1801, (Chiepe, 1957), London Missionary Society (LMS) in 1821, (Vanqua, 1993), Kgalemang Motsete in 1932 (Morton and Ramsay, 1983), Roman Catholic Mission (now St Joseph’s College) in 1932, (Broderick, 1934), and the Swaneng Hill school brigade movement in Serowe, (Van Rensburg, 1967) to have assumed and considered the agricultural-oriented education as appropriate and relevant for colonial Africans. This was linked to the ‘industrial education’ or ‘rural oriented education’ which Mafela (1994) stated became the cornerstone of the educational system for blacks in some parts of America during the 19th century and later got spread out within America. The Phelps Stokes Educational Fund agencies further caused this idea to blossom by providing necessary support; for example, it established the Mochudi Home-craft in Botswana to train women. The various development agencies were of the view that Africans were mainly rural and agriculture-oriented people, thus their education had to be closely aligned with that type of lifestyle. Mafela (1994) further said that ‘while young men were trained to be satisfactory agriculturists and husbands, young women were trained at Mochudi home-craft to be better homemakers’.

Vanqa, (1995) wrote that the idea of teaching of agriculture in the protectorate was pioneered in 1821 by the London Missionary Society (LMS). The first missionaries landed in southern Africa from London with the aim of spreading Christianity to the Africans. They started education as one way to communicate with the indigenous people. Education was also to enable the African to read the Bible. In the process, they realised the socio-economic status imbalance between them and local black families and, therefore found the need to teach food production skills to the Africans. They then started teaching basic skills in gardening and animal husbandry. Vanqa (1995) further stated that at Kolobeng and Dithejwane in the Kweneng district the first schools were established in 1840 while two other schools started operating in Shoshong by 1862. These schools led to the founding of LMS schools at Tigerkloof in South Africa and later Moeding College in Botswana, both with gardens. The institutions according to Mafela (1994) sought to offer industrial training to complement the teaching of industrial subjects at Tiger Kloof and in the ‘normal’ primary schools in the country. The teaching of agricultural skills to indigenous people continued until the 1930's and the 1940's when the present Moeding College was established.
On a similar note, Parson (1983) wrote that the year 1883 marked the realization by the foreign secretary of LMS who visited Bechuanaland at that time from London that vocational education needed to be extended from the curriculum of the Moffat institution to all Christian schools. The secretary reported that the ‘Bechuana’ schools be called for curriculum development beyond scriptural into industrial education. The LMS secretary’s suggestion was inline with the first inspection report on ‘Bechuana’ schools which called for education for development, stressing the need for training artisan skills.

The Dutch Reformed Mission, which was based in Mochudi, pioneered the Mochudi Adolescent Girls School (Mafela, 1994). The debate on its establishment started in the early 1930’s and it was finally set up in 1938 to give basic literacy skills just for reading and writing. The missionaries felt the need to give the girls something more to prepare them to become capable housewives, hence they also established Mochudi Home Craft in 1938.

In 1932, Motsete who was an ambitious educated Botswana citizen, thought of education in terms of self-reliance to improve the conditions of one’s living. He conceptualised self-reliance in line with the definition by Mlay (1983) that self-reliance as a functional education that depicts the principles of equality, respect for human dignity, and sharing of work and its products (Morton and Ramsay, 1987). The scholars further stated that Mr Motsete established the Tati Training Institute at Nyewele near Tshesebe in the North East through a self-help program. The school was built with ‘mephato’ (regiments) labour who participated in cutting timber to put up the structure, while others contributed cattle and grain towards the school. According to Parson (1983), the aim was to build a combined primary-secondary institution with industrial, agricultural and vocational courses and a local community clinic. This advanced the progressive colonial ethos of ‘industrial education’ with a popular nationalist vision of African. Norton and Ramsay (1984) wrote that the Carnegie Corporation of America donated US$ 5,000.00 to Tati Training Institute for five years starting from 1935. The purpose of the institution was to ensure continuation within the school for those who had passed standard five and six at elementary level with the intent to inculcate in the young men the sense of the dignity of labour. Agriculture was a major subject of instruction; it was allocated 12 hours (33.3%) out of 36 hours per week in relation to other eight subjects offered. Other subjects were prayers and scripture 2 hours (5.56%), arithmetic 4 hours (11.11%), English 6 hours (16.67%), history and geography 4 hours (11.11%), Vernacular (Ikalanga) 3 hours (8.33%), hygiene and moral lessons 1 hour (2.7%), singing 1 hour (2.78%) and other subjects 2 hours (5.56%). The authors alluded to the fact that due to political and tribal threats the school was closed in 1941, thus discontinuing the teaching of agriculture.

The closure of the Tati Training Institute in the North East led to the establishment of the BaMmaNgwato Tribal school in Moeng (now Moeng college) in 1949 by the chief and the missionaries (Morton and Ramsay, 1987). The school carried on the tradition of providing modern academic training as an integral part of and not as an alternative to agricultural or industrial training. The author went on to say that the school retained links with farming like St Joseph’s college.

Broderick (1934) wrote that the idea of agricultural education at the secondary school level was conceived in 1934 by the Roman Catholic Mission at Kgale (now St Joseph’s College). The writer further stated that Khale Agricultural College was established as an Adolescent Training Centre in 1934. The aim of the training school was to provide special courses in agricultural work and in general industrial work for the African adolescents. The school first
admitted 6 boys in 1934 to study agriculture after their elementary education. The Kgale agricultural program ceased functioning in 1940 due to financial problems. Coles (1985) wrote that in 1944 St Joseph’s College Khale mission ventured into sustained general secondary education, offering academic subjects with agriculture as gardening. However, the college continued with the existed agricultural projects that existed, which occupied a piece of land of approximately 1,000 acres, with 500 orange trees. The crops grown were: maize, peas, kaffir corn (sorghum), potatoes, pasture, teff, and cowpeas.

The Botswana College of Agriculture (BCA) (2000) prospectus contends that the teaching of agriculture was introduced at Mahalapye Training center in 1959. According to De Beers (1963), the Mahalapye training centre was jointly financed by a United Kingdom Colonial Development and Welfare Grant, the Oxford Committee for Famine Relief, and the Bechuanaland Protectorate Government in 1962. This marked the beginning of a training or teaching of extension in agriculture through the assistance from two British charity organizations, Freedom from Hunger and the Oxfam. The training was aimed at producing local Africans for appointment to the Department of Agriculture on the lower segment of technical grade with the main emphasis on arable agriculture (De Beers, 1963). According to the BCA Prospectus (2000), the functions of the Mahalapye agricultural training centre were later transferred to the current BCA location where it was established as Botswana Agricultural College (BAC) in 1967 and later Botswana College of Agriculture (BCA) which is an Associate Institution of the University of Botswana’s Faculty of Agriculture through Act of Parliament No. 9 of 1991.

Van Rensburg (1974) wrote that in 1963, Swaneng Hill School in Serowe was established through a self-reliance (people’s own initiatives) program. This was the brigades’ movement, established as an attempt to overcome the potentially serious situation created by the rising number of unemployed primary school leavers. A brigade was a community affair, designed to help meet the national need for workers with skills in building and allied trades (Coles, 1985). The author wrote further that the Serowe brigade incidentally helped build Swaneng Hill secondary school in Serowe, and influenced the establishment of Madiba school in Mahalapye and Shashe River school in Tonota. The idea caught the imagination of many and further brigades were established in different parts of the country, which in some areas included farming activities. These schools offered agriculture skills and other vocational skills for survival to the Primary School Leaver and school dropouts.
Table 1. Dates and intervention on agriculture in the education system of Botswana

<table>
<thead>
<tr>
<th>Dates</th>
<th>Interventionist</th>
<th>Major focus of the intervention</th>
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<tbody>
<tr>
<td>1805</td>
<td>Dutch Reformed Church Missionaries</td>
<td>general education for converts to read the Bible plus industrial education</td>
</tr>
<tr>
<td>1821</td>
<td>London Missionary Society</td>
<td>General education for converts and food production skills for Africans</td>
</tr>
<tr>
<td>1932</td>
<td>Reverend Kgalemang Motsete</td>
<td>to ensure continuation of education with living skills to focus on primary-secondary institution with industrial, agricultural and vocational courses</td>
</tr>
<tr>
<td>1934</td>
<td>Roman Catholic Mission at Khale</td>
<td>Adolescent training centre providing special courses in agriculture work and general industrial work for African child to gain living skills required for African child</td>
</tr>
<tr>
<td>1949</td>
<td>Nwato Tribal Authorities and the Missionaries</td>
<td>To provide modern academic training as an integral part of and not as an alternative to agricultural or industrial training</td>
</tr>
<tr>
<td>1962</td>
<td>The Oxford Committee for Famine Relief and Bechuanaland Protectorate government</td>
<td>Trained and taught agricultural extension educators marked the beginning of training in agricultural extension</td>
</tr>
<tr>
<td>1963</td>
<td>Van Rensburg</td>
<td>Brigades movements providing hands-on skills including agriculture through self-reliance for school drop outs after the primary school leaving Examination (PSLE).</td>
</tr>
<tr>
<td>1966</td>
<td>New government comes into power. Country changes from ‘Bechuanaland Protectorate’ into ‘Botswana’.</td>
<td>C curriculum reforms/changes New schemes of agriculture came into existence</td>
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</tbody>
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Source: Compiled from the Botswana National archives official records

The post-independence period (1966 to 2000). According to Taukobong (1983), the post-independence period has made a great deal of effort to correct the mistakes of the past. For example, the attitude of the farmers that agriculture was merely for subsistence had to be changed, and the reorganising the structure of the Ministry of Agriculture, thus creating Field Services, Animal Health, Research and Planning, and Statistics departments. This was coupled with an accelerated programme of training to produce required human power. The writer further stated that on the other hand the new government decided that development in agriculture could also mean involving the youth of the country in agricultural activities. This led to the formation of 4-B Youth Movement as well as the introduction of agriculture as a subject in the schools and teacher training institutions. A personal interview with Dr Sibanda (2001) revealed that the agriculture curricula were also developed and teachers of agriculture were trained. The Botswana Agricultural Teachers Association was also established.
The primary aim of education at post-independence was to create a stock of trained human resources to develop the economy. One of the tasks of the new Ministry of Education after 1966 was to improve the curriculum, which was described to be narrow, with little attention to practical or cultural activities or subjects not suited for the country’s needs, especially in the areas of arable farming and cattle raising (National Development Plan, 1967; Smith 2002). According to Coles (1985), schools offered subjects such as Setswana, English, mathematics, biology and hygiene, history, geography, agriculture (boys), domestic science (girls), and crafts. It is for this reason that the first policy on education that came into operation in 1977 advocated for the inclusion of agriculture as a practical subject for both boys and girls.

The agricultural education program has experienced a lot of changes in terms of curriculum and objectives. When the idea of teaching agriculture was introduced, the aim was to prepare people for living, giving them the skills to survive. This has since been modified into a complex program with diversified career opportunities. Thus, the current agriculture curricula offer skills in animal husbandry, horticulture, crop husbandry, agricultural economics and field crops. There has been an increase in the number of trained Botswana agricultural teachers from zero trained teachers between 1900 and 1966, two trained teachers of agriculture in 1976 to over 600 teachers of agriculture in the year 2001. The development of agriculture teacher education programs at Botswana College of Agriculture and the Tonota College of Agriculture reduced the number of local agriculture teachers trained in Swaziland and other countries of the world.

Personal interviews with Smith (retired) (2002) and Sibanda (2001) revealed that agriculture was not part of the curriculum in 1966 but had traces of having existed before at Moeding College, Moeng, Swaneng Hill, Shashe River schools and St Joseph’s College. Electronic interviews with Smith (2002) from Britain revealed that agriculture was introduced after independence for three reasons: as a basis for the economy of the country and occupation of the majority of the population, to create balance to the curriculum and as a means to produce fresh fruit and vegetables for a healthy diet. However, a personal interview with Dr. Sibanda (2001), former education officer for agriculture (retired), revealed that the introduction of agriculture in schools was met with challenges such as (i) climatic conditions (ii) lack of trained teachers (iii) political sanctions against South Africa which made developing countries like the United States of America and Britain to develop cold feet in providing assistance, and (iv) teachers’ attitudes.

**Effect of agricultural education on agricultural development in the pre-independence era**

The role of education as an instrument for liberating people from ignorance and for empowering people to work as active stakeholders towards their development is incontrovertible (Adedoyin, 1993, Taukobong, 1983). In line with this view, the agricultural education intervention of the pre-independence era in Botswana created the awareness of agriculture as the major source of self-reliant food security program, attracted the attention of interventionists, prepared the frame of mind on the importance of agricultural training, prepared the structural framework on which the modern day agricultural education program was built, brought the value of skill training especially in agriculture to forefront at all levels of education, initiated extension education services to farmers and rural people, initiated
youth and women development activities, and generated the core of trained workforce for agricultural production, teaching of agriculture and leadership in agricultural development during the era

Effect of agricultural education on agricultural development today

Hitherto, teachers of agriculture and professionals as well as practitioners in agriculture were trained in Swaziland, Kenya, Tanzania, USA, UK, and some other neighbouring countries. However, the post-independence era has rapidly created the required facilities, the internal capacity, and required orientation for pursuance of sound agricultural education programs at all levels of the educational system of Botswana. Not only that practical agriculture is compulsory at primary and secondary levels, the curricula have been severally reviewed to become suitable to meet the needs of the country and the prospective needs of the students. The tertiary agricultural education program and curricula have been improved to produce teachers and professionals in agriculture at Diploma, Higher Diploma, and up to the Bachelor’s degree (BSc) level. Although higher degrees in agriculture and agricultural education are still currently not available in the country, the Botswana College of Agriculture is about to commence its postgraduate programs within the next few years.

Agricultural education has thus impacted very much on agricultural development in Botswana during the post-independence era. The areas of impact include:

1. Dynamic primary school agricultural education curriculum content that strengthens students to be able to continue into secondary school level and which equips students with skills for practical agricultural production as well as favourable disposition towards agriculture as a science after primary education.

2. Compulsory theoretical and practical agricultural training at the junior secondary and senior secondary school levels. They prepare students for employment in agricultural services, self-employment in agricultural production or farming, and for pursuance of higher education at tertiary levels.

3. Sound, diversified tertiary education programs that is fast advancing towards postgraduate level.

4. The generation of different cadres of competent workforce required for teaching of agriculture, extension services, self-employment and paid employment in agriculture to service the ministries, industries, and non-governmental agencies.

5. Virile extension service for farmers and rural economic operators.

6. Rapid development of small, medium and large scale agricultural and input organisations.

7. Food availability through domestic production with some surpluses for export. On the general, agricultural education has generated the potential for Botswana’s agriculture to launch into a modern agricultural economy through which the employment, food security and industrialisation needs of Botswana would be better met.
Educational Implications

Adequate evidence exists that agricultural education has developed considerably from pre-independence to post-independence. It has developed from mere gardening and livestock rearing skills to a complex modern agricultural education program capable of providing students with pre-vocational skills. The secondary school curricula components currently include basic knowledge on agricultural economics, animal management and husbandry, farm engineering, field crops, fruit and vegetable production, environmental education, and developmental issues affecting agriculture. This has provided for diversified career opportunities for the youth leaving secondary schools to work and for further training. The secondary agricultural education programs have developed to provide one part of the core curriculum in junior secondary schools commonly chosen as popular optional subject by many students. The tertiary agricultural education programs at Diplomas, Higher Diploma, and degree (BSc) levels have been established productively. It is now leaping towards post-graduate studies.

Agricultural education has had effect on the employment of the people of Botswana. It has influenced agriculturally oriented businesses, the utilization of government and non-government organizations’ financial schemes, and the change of attitudes towards agriculture. Agriculture is now recognized as an applied science and subject essential for human life. Its recognition has made people take it up at higher levels and that allows them take part in decision and policymaking, leadership, and governance at all levels of the economy.

The above achievements notwithstanding, there is need for policy reorientation on support of agricultural education so that it can better play its role towards agricultural development and food security of Botswana. The current level of food security experienced in Botswana is not based on domestic production. Hence, government and all stakeholders should work harder for a better future of self-sufficient in production. Towards this end, a reasonable percentage of government’s annual budget should be devoted to agricultural education in schools to expand its scope and enhance its quality, to provide for re-training for those in paid as well as self-employment, and to sustain the high standard of agricultural education through improved condition of service for agricultural educators at all levels.

Conclusions

Human resources remain the most cardinal of all production and development resources. Hence, the scope and quality of agricultural development in Botswana is a factor of quality of its agricultural education. Because agriculture touches the life of the people of Botswana much more than the solid minerals currently dominating the economy, education programs preparing people to profit from it must be given priority. However, the history of agricultural education in Botswana has revealed the need to place emphasis on vocational-technical and technological education in agriculture. The policy re-orientation advocated must guarantee this in addition to providing the resources in support of qualitative agricultural education and well-motivated teachers of agriculture in Botswana.
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