Objectives Achievement of the Schools Agriculture Program in Swaziland: Implications for Future Curriculum Reforms

Barnabas M. Dlamini, Professor
The University of Botswana

Keregero J. B. Keregero, Professor
The University of Swaziland

Abstract
A descriptive survey study, employing triangulation procedures, was conducted to determine the extent to which the modern agriculture program in Swaziland secondary schools has achieved its objectives, and whether statistically significant differences existed among respondent’s perceptions. The study revealed that the program has facilitated the demonstration and practice of business aspects of farming and created awareness of career opportunities in farming and its associated technologies. The program has laid a foundation for further academic studies in agriculture, and provided a basis for understanding the role and methods of extension agencies. Statistically significant differences in program rating were observed between the perceptions of teachers and students, and by place of regular residence (rural, peri-urban and urban). The study further found that the statistically significant differences were small, and of no practical value. Thus, demographic characteristics of respondents were eliminated as confounding the results of this study.

Introduction
Education is viewed as a primary means of solving social problems (Worthen & Sanders, 1987; Freire, 1973). Development plans had, often placed the future welfare of nations squarely on the shoulders of schools and other educational institutions. The Second National Development Plan (1973 - 1977) of Swaziland recognized that efficiency in the school system was limited by its inherent academic orientation. It had little promise for wage employment opportunities for school leavers. This underscored the need for reorienting the curricula at primary and secondary school levels, to counteract prevailing non-technological bias, and enable school leavers to move more naturally into employment opportunities available for them, particularly in rural occupations.

The introduction of agriculture in schools was one attempt to address the inadequacies of the school system in relation to the future prospects of school leavers. Emphasis on agriculture was based on the premise that it plays a significant role in the economy of Swaziland, as it is the most important economic sector, followed by manufacturing (Dlamini, 1986). Besides, to a reasonable extent, the introduction of agriculture in schools in Africa was generally hailed as a panacea for agricultural development. Nowhere else could such a momentum have been of significance than in Swaziland, where agriculture forms the backbone of the economy. The introduction of the Schools Agriculture Program (SAP) is regarded as, perhaps, the most important educational innovation in Swaziland (Gooday, 1974). It represents one strategy for implementing the objectives of the Second National Development Plan to reorient the secondary school curriculum away from its non-technological bias (Sullivan, 1981). Through the introduction of SAP, the Government of the Kingdom of Swaziland aimed at laying down the framework for the adoption of agriculture and its integration into the occupational and academic lives of the youth.

Thus, SAP was introduced to catalyze the social and economic development of Swaziland, particularly by transforming the knowledge, skills and attitudes of those who were targeted to participate in the program. The wisdom of introducing agriculture in schools in Swaziland and elsewhere in Africa lies in the premise that the school is a catalyst for change in society and can be effectively used to transform it (Datta, 1984). That is, instead of schools operating as isolated enclaves for the dissemination of dysfunctional elitist education, they can be transformed into centers of learning for rural transformation (Nyerere, 1967).
In a broader context, the inclusion of agriculture in the curriculum at all levels in African schools has raised many expectations. The most frequently mentioned ones are that the inculcation of farm skills would solve the school-leaver problem. The school garden would, hopefully, reduce the cost of educational delivery. The teaching of agriculture would de-emphasize the elitist white-collar mentality ushered in by the coming of formal general education, and that the teaching of agriculture has a greater likelihood of using local, real-life examples and the surrounding environment.

Attempts have been made to evaluate SAP during its early years. A study conducted by the School Lever Tracer Project in 1979 sought to investigate what had happened to students who left school during the five-year period, 1973-1977. A major finding was that SAP was showing signs of success in bringing about more positive attitude towards agriculture among Grade 12 leavers (Sullivan, 1981). The British Overseas Development Administration (ODA) conducted two in-depth evaluations of SAP, one in 1978 and the other in 1982. These evaluations revealed that agriculture was becoming popular and interesting, and that SAP was creating favorable attitudes towards agriculture, although it was not yet persuading them to go back to the land (Hitchings, 1982). They also pointed to the fact that SAP was so firmly established and so unique in southern Africa that it could be used as a model for other African countries. The program was a showcase as it attracted observers from Togo, Nigeria and Zimbabwe. The program stood a good chance serving as the pacesetter in the provision of agricultural education in African schools.

Many piecemeal studies of limited scope have attempted to examine isolated components of the program. Dlamini (1982) re-conceptualized the objectives of SAP as developed by Gooday (1980) and used them as a basis for examining the extent to which the agriculture program in secondary schools of Swaziland was performing. His major conclusions, which were based on responses from agriculture teachers and headmasters was that the original objectives of the agriculture program at secondary school level was being achieved. Efforts were needed to strengthen the teaching of the role and methods of the extension service. Efforts were also needed to strengthen the ability of teachers to teach agricultural mechanization, career opportunities and extension agency responsibilities. The agriculture teacher-training program at the University of Swaziland ought to be reviewed and improved. Dlamini (1993); Mkhathshwa (1992); Dlamini (1989); Khoza (1986) and Dlamini (1986) conducted other piecemeal studies and came up with similar conclusions and implications.

It is now a little more than a quarter of a century since SAP was introduced in Swaziland. Many useful lessons have been learned from the few evaluations conducted during the early stages of the program. However, subsequent studies have not been comprehensive and up-to-date. As a result, there are paucities of coherent, dependable and defendable data regarding the performance of the program. Therefore, a formative evaluation of the performance of SAP was conducted to determine its effectiveness.

**Purpose and Objectives of the Study**

The purpose of the study was to examine the performance of SAP. The specific objectives of the study were to:

1. Determine the extent to which SAP has achieved its objectives.
2. Determine if significant differences existed in perceptions of respondents regarding the extent to which SAP has achieved its objectives, and by demographic characteristics.
3. Determine the views of parents regarding SAP
4. Determine factors affecting the effectiveness of SAP in schools, its constraints, and its perceived future role.

**Methodology**

The study was descriptive in nature, employing both quantitative and qualitative procedures.

**Population and sample**

The target population of the study included 12 000 grade 12 students from 45 schools, 65 agriculture teachers in secondary schools, and 12 000 parents of students studying agriculture as a subject in high schools. The Ministry of Education provided the lists of teachers. Head teachers provided the lists of students and parents. Representative samples of students (n=430), and agriculture teachers (n=57), were drawn from the target population using Krejcie and Morgan (1970) formula for
determining sample size. To obtain the sample for parents, a stratified random sample of students by performance level (high, average, and low) was drawn. A further random sample was drawn to obtain three students per school (one from each category of performance level). The parents of students who were sampled became the sample for the study, and this sampling procedure resulted in a sample size of parents (n=135).

Instrumentation

Three instruments were developed for this study. The first instrument was developed for students and teachers. The instrument was divided into two parts. Part A consisted of statements pertaining to the extent to which the SAP has achieved its objectives. Respondents were requested to indicate their level of agreement on one to six point Likert type scales. The scales were anchored as follows: 1 = Strongly Disagree, 2 = Disagree, 3 = Slightly Disagree, 4 = Slightly Agree, 5 = Agree, 6 = Strongly Agree. Part B of the instrument asked about demographic characteristics of respondents. The second instrument consisted of open-ended questions that requested parents to indicate their views regarding SAP. The third instrument was developed for teachers and consisted of statements pertaining to factors affecting the effective performance of SAP, factors constraining the effectiveness of SAP, and the future goals of SAP. Respondents were requested to indicate their level of agreement on one to six point Likert type scales. The scales were anchored as follows: 1 = Strongly Disagree, 2 = Disagree, 3 = Slightly Disagree, 4 = Slightly Agree, 5 = Agree, 6 = Strongly Agree.

Validity and reliability of the instruments

A panel of experts reviewed the instruments and attested to their content validity. To establish reliability, a pilot test of the close-ended instruments was conducted using students and teachers, not participating in this study. Cronbach’s Alpha reliability coefficients were computed for each domain, and were found to range between .74 and .91.

Data collection procedures

The researchers with the help of research assistants administered the research instruments. An orientation session was held prior to the commencement of data collection to acquaint research assistants with the knowledge, skills and attitudes required for data collection. Head teachers in the selected schools were requested to assist in making the necessary arrangements for the availability of selected students and teachers for the study on specific dates and at specified times. Research assistants interviewed parents in their homes.

Data Analysis

Descriptive and inferential statistics were used to summarize and interpret quantitative data. The Statistical Package for Social Sciences (SPSS, 1996) was utilized to analyze data. A prior alpha level of .05 was used to determine statistical significance. Data from qualitative instruments were summarized through content analysis, inductive categorization of issues and formulation of themes to facilitate interpretation.

Findings

The extent to which the SAP has achieved its objectives

Respondents were asked to indicate their level of agreement with regard the extent to which SAP has achieved its objectives. The findings presented in Table 1 show that SAP has facilitated the demonstration and business aspects of farming, with an overall mean rating of 4.48. Findings revealed that respondents agreed that SAP was able to create awareness of career opportunities in farming and associated technologies, with an overall mean rating of 3.88. However, teachers rated this aspect lower than students did. Further, findings showed that the agriculture program in schools has created a framework for students to pursue further academic studies in agriculture. The last question addressed the extent to which SAP has contributed towards understanding the role and methods of agricultural extension agencies. Teachers rated this aspect lower than students, and disagreed that SAP has contributed towards understanding the role and methods of agricultural extension agencies.
Table 1

The extent to which SAP has achieved its objectives

<table>
<thead>
<tr>
<th>Domain</th>
<th>Students Mean</th>
<th>Teachers Mean</th>
<th>Overall Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>SD</td>
<td>SD</td>
<td>SD</td>
</tr>
<tr>
<td>n=430</td>
<td>n=57</td>
<td>n=487</td>
<td></td>
</tr>
<tr>
<td>1. facilitated demonstration and business aspects of farming</td>
<td>4.50</td>
<td>4.30</td>
<td>4.48</td>
</tr>
<tr>
<td></td>
<td>.63</td>
<td>1.03</td>
<td>.69</td>
</tr>
<tr>
<td>2. created awareness of career opportunities in farming and associated technologies</td>
<td>3.93</td>
<td>3.54</td>
<td>3.88</td>
</tr>
<tr>
<td></td>
<td>1.08</td>
<td>1.19</td>
<td>1.10</td>
</tr>
<tr>
<td>3. created a framework for the pursuit of further academic studies in agriculture</td>
<td>4.37</td>
<td>4.41</td>
<td>4.34</td>
</tr>
<tr>
<td></td>
<td>.85</td>
<td>1.09</td>
<td>1.66</td>
</tr>
<tr>
<td>4. contributed towards understanding of the role and methods of agricultural extension agencies</td>
<td>3.96</td>
<td>3.44</td>
<td>3.89</td>
</tr>
<tr>
<td></td>
<td>.95</td>
<td>.99</td>
<td>.97</td>
</tr>
</tbody>
</table>

Rating scale: 1 = Strongly Disagree, 2 = Disagree, 3 = Slightly Disagree, 4 = Slightly Agree, 5 = Agree, 6 = Strongly Agree

Summary of differences in perception between agriculture teachers and students

The study, also, provides a summary of statistically significant differences in perceptions between teachers and students (Table 2) regarding objectives achievement. A t-test was used to determine significant differences. Results revealed statistically significant differences on three of the four objectives. Though significant differences were observed on these three objectives, both teachers and students rated these objectives high and agreed that the agriculture program in schools has achieved these objectives. Teachers disagreed (Mean=3.44) that SAP has contributed towards understanding the role and methods of agricultural extension agencies, while students agreed that this objective is being achieved (mean=3.96).

Influence of demographic characteristics on perceptions of agriculture teachers and students regarding the SAP

Findings indicate that, of the 57 teachers, 39 or 68% were male and of the 430 students, 237 or 49% were male. Student age ranged from 14 years to 28 years with a mean age of 16. Further, 350 (71.9%) of the students were still studying for Junior Certificate at secondary school, 40 (8.2%) had completed Junior Certificate and were already working, 29 (6%) of the students had completed Junior Certificate and were enrolled in institutions of higher learning. Also, most of the students, 187 or 38.4%, were residing in rural areas, while the second largest group, 131 or 26.9% of the students, resided in peri-urban areas. The remainder, 84 or 17.2%, resided in urban areas. About 33.33% in each category of the students were high, average or low achievers.
Table 2

Summary of differences in perception between agriculture teachers and students

<table>
<thead>
<tr>
<th>Domain</th>
<th>Students</th>
<th>Teachers</th>
<th>Overall</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean SD</td>
<td>Mean SD</td>
<td>Mean SD</td>
</tr>
<tr>
<td></td>
<td>n=430</td>
<td>n=57</td>
<td>n=487</td>
</tr>
<tr>
<td>The SAP has:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. facilitated demonstration and business aspects of</td>
<td>4.50 .63</td>
<td>4.30 .69</td>
<td>4.48 .69</td>
</tr>
<tr>
<td>farming</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. created awareness of career opportunities in</td>
<td>3.93 .54</td>
<td>3.54 .19</td>
<td>3.88 .11</td>
</tr>
<tr>
<td>farming and associated technologies</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. created a framework for the pursuit of further</td>
<td>4.37 .85</td>
<td>4.41 .09</td>
<td>4.34 .66</td>
</tr>
<tr>
<td>academic studies in agriculture</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. contributed towards understanding of the role and</td>
<td>3.96 .95</td>
<td>3.44 .99</td>
<td>3.89 .97</td>
</tr>
<tr>
<td>methods of agricultural extension agencies</td>
<td></td>
<td></td>
<td></td>
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</tbody>
</table>

*p < .05. Rating scale: 1 = Strongly Disagree, 2 = Disagree, 3 = Slightly Disagree, 4 = Slightly Agree, 5 = Agree, 6 = Strongly Agree

An inferential statistic of t-test and analysis of variances (ANOVA) was employed to determine the influence of the demographic characteristics of respondents on perceptions regarding SAP. Statistically significant differences in program rating were observed between teachers and students on only one of the four domains compared: created a framework for the pursuit of further academic studies in agriculture. The differences were by place of regular residence (rural, peri-urban, and urban). Post hoc analysis, of Scheffe Test (appropriate for unequal sample sizes) showed that the perceptions of urban and peri-urban respondents differed on one of the domains compared (Table 3). However, statistically significant differences observed were small (difference of .12 points in this study), and of no practical value. Thus, demographic characteristics of respondents were eliminated as confounding the results of this study.

View of parents regarding the agriculture program in schools

The findings reveal that most of the parents were familiar with SAP, and thought what their children had learned in the agriculture program was of use to them (children themselves). Only a slight majority considered what their children had learned in the agriculture program to be of use to their communities. Parents were almost evenly divided on whether or not what their children had learned from the agriculture program was of any use to the country. Most of the parents indicated that, if they were to do it all again, they would enroll their children into the agriculture program.

The parents were also asked to indicate the field that they would like or would have preferred their children to pursue. They indicated the following fields of study: Accounting, agriculture, teaching, engineering, farming, medicine, veterinary medicine, nursing, administration and home economics. Other fields preferred were self-employment, forestry and any choice by the child.

When asked about the general field they would like or would have liked their children to pursue for higher education, the parents indicated the following: Agriculture (crop production), agriculture (livestock production), agricultural education, commerce, child choice, agricultural extension, engineering, education, social science, medicine, nursing, home economics, forestry and science.
Table 3

Differences in perceptions of agriculture teachers and students by place of regular residence

<table>
<thead>
<tr>
<th>Domain</th>
<th>Rural Mean</th>
<th>Rural SD</th>
<th>Urban Mean</th>
<th>Urban SD</th>
<th>Periurban Mean</th>
<th>Periurban SD</th>
<th>f-value</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>The SAP has:</td>
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<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. facilitated demonstration and business aspects of farming</td>
<td>4.48</td>
<td>.64</td>
<td>4.47</td>
<td>.64</td>
<td>4.56</td>
<td>.58</td>
<td>.74</td>
<td>.47</td>
</tr>
<tr>
<td>2. created awareness of career opportunities in farming and associated technologies</td>
<td>3.88</td>
<td>1.14</td>
<td>3.81</td>
<td>1.19</td>
<td>4.11</td>
<td>.91</td>
<td>2.41</td>
<td>.09</td>
</tr>
<tr>
<td>3. created a framework for the pursuit of further academic studies in agriculture</td>
<td>4.34</td>
<td>.82</td>
<td>4.22</td>
<td>.89</td>
<td>4.52</td>
<td>.79</td>
<td>3.51</td>
<td>.03</td>
</tr>
<tr>
<td>4. contributed towards understanding of the role and methods of agricultural extension agencies</td>
<td>3.93</td>
<td>.94</td>
<td>3.87</td>
<td>1.02</td>
<td>4.04</td>
<td>.88</td>
<td>.93</td>
<td>.39</td>
</tr>
</tbody>
</table>

p < .05. Rating scale: 1 = Strongly Disagree, 2 = Disagree, 3 = Slightly Disagree, 4 = Slightly Agree, 5 = Agree, 6 = Strongly Agree.

*a = same letters indicate statistically significant differences between groups using Scheffe Test

About the skills that they would like their children to learn or to have learned at school in order for them to be of help in improving farming activities at home, the parents indicated the following: production of livestock, practical farming, extension, and tractor driving, operation and maintenance. Pest and disease control, commercial farming, income generation, innovativeness, fertilizer application, sugarcane production, vegetable production, application of manure, and honey production were also among those subjects parents would like their children to learn from the school.

Parents indicated that, because of what their children might have learned from SAP, they can share with them new ideas about farming operations at home. The aspects cited included crops and spacing of vegetables, raising broilers, management of crops, management of animals, fertilizer application and use of hybrid seeds and the applications of manure, knowledge on crop rotation, timely application of manure, use of treated seeds, pests and disease control, and vaccination of animals. Other ideas included productions of fruits, grading of eggs, use of organic fertilizers, weighing birds for sale, stopping cannibalism in chicken, spraying, soil testing, proper feeding of rabbits and chicken, and making use of an extension worker.

Parent’s responses on what the school agriculture program was concerned with, included growing vegetables, and rearing animals, particularly chicken and rabbit.

Improving one resource, imparting agricultural skills to children, teaching students about farming as a business, conducting agricultural competitions, production and marketing of crops, soil conservation, helping rural farmers to improve the methods of farming, and modern farming were also cited as concerns of SAP.

Factors Affecting the Effectiveness of SAP

The factors affecting the effective performance of SAP were examined in terms of promoters and constraints, and are reported using qualitative procedures.

Factors promoting the effectiveness of SAP

Factors viewed by respondents to be promoting the effectiveness of SAP (statements that received mean ratings of 5.00 and above) were that: the program emphasizes practical teaching and learning. Also, students have a positive attitude towards agriculture and there are links from one level (a junior certificate level) to the next level (senior secondary level). Others included effective communication between school administration and agriculture departments; strong administrative support, and highly trained local teachers and head teachers and timely visits by coordinators to the schools. Availability of resources and/or infrastructure and the excellent cooperation among co-coordinators, agriculture teachers and head teachers were also cited as promoters of SAP. The school administration provides support in addressing the problems faced by the agriculture
departments. The program provides incentives to students as vegetables, crops, chicken and rabbits. The government and the parents provide financial resources for the programs that permit the provision of in service training/workshops/seminars for teachers. The introductions of pre-vocational agriculture and the excellent support given by parents to students were also identified as promoters.

Factors constraining the effectiveness of SAP

Teachers views regarding the constraints to the effectiveness of SAP (statements that received mean ratings of below 3.50) included the inadequacy of funds to purchase required equipment and tools, high number of students per class that made classroom management difficult, and limited in service training programs to upgrade teachers knowledge and skills. Inadequate practical time, unattractive terms and conditions of service, limited visits to commercial agriculture farms and/or enterprises, and limited exposure of students to agricultural industries were also cited as some constraints.

Perceived future role of SAP

The future role of SAP is viewed by respondents as improving agricultural production, emphasizing practical training, offering vocationally based training in secondary schools, teaching students self employment skills, providing pre-vocational offerings in all schools, introducing computer-assisted instruction, and being community-based and relevant to the needs of the private sector. The future role is also viewed as introducing in service training courses for teachers, having effective links with the University, and introducing environmental and nature conservation topics in the high school curriculum. Other aspects were introducing a loan scheme for students while studying, teaching business and marketing skills, helping students get started in farming, eliminating poverty in our society, introducing home projects, introducing income generating skills, introducing more science concepts, and producing students who are self-reliant. These statements received mean ratings of 4.5 and above.

Conclusions and Implications

The conclusions and implications for curriculum reforms are presented in this section. The study concluded that the SAP in Swaziland has achieved its objectives in terms of facilitating the demonstration and practice of business aspects of farming, and by creating awareness of career opportunities in farming and its associated technologies. The program has laid a foundation for further academic studies in agriculture. Further, the program has been successful in giving students a clear basis for understanding the role and methods of extension agencies. However, teachers and students perceived the achievements of the program at different levels.

These findings indicate that parents were generally aware of the agriculture program in which their children were involved. The parents considered the program to be useful to the children themselves, to the parents and the households. The fact that parents indicated willingness to enroll their children in the agriculture program if they were to do it all again is a strong endorsement for the program, and reflects their satisfaction with what it has offered so far. The almost average endorsement for the usefulness of the agriculture program at community level can be explained in various ways. Most parents do not yet perceive their efforts to educate their children as directed merely at the possibility of enabling such children to be of service to the community, as opposed to enabling them to get jobs and only contribute to the community indirectly. Unlike the village structure that provides greater possibility for interaction and mutual support, in Swaziland, the communities are made up of autonomous homesteads, leaving children with no major obligations to the community. The traditional governance structure that would have been more facilitative delves more into traditional, rather than educational obligations. Besides, there are hardly any community-based projects that could be perceived by parents as having potential for utilizing skills and knowledge gained by their children. The split opinion on the contribution of what the children had learned to the country could be a reflection of the fact that parents did not know the wider context in which their children’s learning would be applicable on a national scale.

Several implications for the future could be drawn from this study. The ability of the
program to facilitate the demonstration and practice of business aspects of farming points to the growing likelihood that the program will produce graduates who are increasingly capable of putting into practice what they learn from school. This, coupled with the fact that the program has also created awareness of career opportunities in farming and its associated technologies, indicates increasing potential possibilities for employment, including self-employment. Given the dwindling employment opportunities in the public sector, positive rating of these two aspects reveals the growing recognition that there is a future in agriculture. Advantage should be taken of this positive attitude by introducing more innovations in the schools agriculture program through: the introduction of experiential learning approaches; development of entrepreneurial skills; and emphasis on teamwork and group problem solving.

That the program has laid a foundation for further academic studies in agriculture points to the increasing pool of students that now, than ever before, seek to pursue the subject at high school and university levels. This has the direct implication on the need for expansion of the intakes at high school and university levels to open more opportunities for the capable young men and women who yearn for higher education in agriculture. The finding that the program has provided a basis for understanding the role and methods of extension agencies has implications for the collaboration between the schools agriculture program and the agricultural extension service. The agricultural extension officers who are based in rural areas could be utilized in sharing practical experiences with students to enrich their understanding of the practical realities in farming. While, the agricultural extension officers could utilize students as focal points, through whom agricultural innovations could be disseminated to rural households. This has an in-built multiplier effect in the sense that the few extension officers available in rural areas will be enabled to reach more clientele than could be possibly reached by them acting alone.

References


