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## **AGRICULTURAL EDUCATION: Definitions and Implications For International Development**

**D. Craig Anderson**  
Introduction

### **Purpose**

The purpose of this manuscript is to discuss the role of agricultural education as one component of the agricultural programs of developing nations. Certainly the complexity of agriculture requires an array of inputs,<sup>1</sup> all of which are important in strengthening the agricultural development process. This manuscript will present a rationale for education in agriculture as one of the most crucial of such inputs. To accomplish this objective, following sections will address (1) the definitions attributed to the term 'agricultural education' in the context of international agricultural development, (2) a justification for the inclusion of agricultural education in development programs and (3) the general role agricultural education could assume in such programs.

### **Setting the Stage**

During the past three decades, international attention has been directed at agricultural production in general, and specifically at the development of the agricultural sectors of the world's lesser developed nations. Agricultural development for these countries is critical. Characteristically, these nations are heavily dependent on agriculture as their primary economic activity (Tinnermeier, 1974; Ryan and Binswanger, 1979). Malassis (1975) indicates that developing nations typically (1) have extremely high percentages of their populations engaged in agriculture, (2) maintain a high percentage of agricultural exports in relation to total exports, and (3) have agricultural sectors which contribute heavily to the total gross domestic product (GDP). Ironically, however, agricultural GDP per agricultural worker rarely exceeds even half the per capita GDP in these same nations. In short, although

Anderson prepared this manuscript as a research assistant in the Department of Agricultural Education at Iowa State University, Ames, IA. 50010

developing nations are highly dependent on agriculture, it remains a weak sector of their economies. These conditions point out the urgent need to both stimulate production and enhance the relative stature of agriculture in developing nations.

### **Definitions of Agricultural Education**

A number of individuals have addressed the development process for agriculture, and in so doing have referred to agricultural education. The result is a variety of meanings assigned to the term 'agricultural education' when used in the context of international development.

To those most familiar with the U.S. educational system, agricultural education commonly refers to those activities directed at the preparation of teachers of vocational agriculture. However, this is not the common definition as viewed from the perspective of international development.

For instance, Roberts (1980) infers that international agricultural education consists of programs in higher education such as short-term trainees at U.S. universities, U.S. faculty degree teaching in foreign countries, and short-term training in-country conducted by university faculty members. Broadening this perspective, others classify agricultural education as the general mission of colleges of agriculture in higher education — quality instruction in all agricultural subject areas (Love, 1982).

A popular interpretation of agricultural education is that it is fundamentally synonymous with agricultural extension. This can include either programs for training extension workers or, most commonly, field programs directed at small farmers. Indeed, extension in some form is commonly visualized as the primary mechanism for promoting increased productions via the diffusion of new technologies and their ultimate adoption by farm clientele. Adult education programs for rural populations are a form of extension that are viewed by some as a means for educating adult farmers, both in agriculture and other subject areas (Hall and Kidd, 1978). Others advocate the utilization of indigenous knowledge systems and indigenous technology in both adult education and extension. Brokensha et al.(1980) contend that this methodology greatly enhances the success of extension programs.

Coombs and Ahmed (1974) are also proponents of nonformal extension education as a means for achieving rural development, including agriculture. They define it as "any organized, systematic, educational activity carried on outside the framework

<sup>1</sup>Inputs are of two general types. Institutional support inputs are policies, procedures, and mechanisms which are conducive to agricultural growth (e.g., extension education programs, adequate market channels, favorable pricing mechanisms). Production-oriented inputs are resources and practices contributing to production enhancement (e.g., new and improved plant varieties, fertilizer and pesticide usage, water management).

of the formal system....Thus defined, nonformal education includes, for example, agricultural extension and farmer training programs...."(p.8).

The term 'agricultural education in developing countries' has also been used to describe, in aggregate, the various training projects associated with the international research centers located around the world, even though these training efforts are not coordinated among the centers (Rockefeller, 1974; 1976).

Some individuals have suggested definitions for agricultural education that extend beyond those reviewed above. Curle(1970), for example, presents his thesis that education as it relates to agriculture includes the whole range of formal programs which can be initiated by governments. This includes not only extension training, secondary and higher education, but teacher training and vocational education in agriculture, as well. Similarly, Kimmel (1982) and Malassis (1975) interpret agricultural education broadly, covering a wide array of possible programs whose purpose is instruction in agriculture.

An all-embracing explanation of agricultural education has also been offered by Habito (1980), who presents an outline for manpower resources in agriculture that encompasses everything from non-formal education to highly technical education at the university level.

It is evident that many definitions have and can be given to agricultural education, especially as it relates to international agricultural development. One must surely conclude that agricultural education, as it pertains to international development, consists of any and all organized programs whose purpose is education or training in agricultural subjects.

#### **Justification and Rationale**

Previous sections have been directed at setting a proper stage for the topic and reviewing the meaning of international education in agriculture. The next step is to answer the question, "Is there a place for agricultural education in agricultural development?" The response appears obvious. If the development of agriculture is, as has been demonstrated, critical to the economies of developing nations, and if education has a legitimate function to perform in agriculture (a thesis everyone involved in agricultural education in any of its forms could subscribe to), then one can deduce that agricultural education is a legitimate component of agricultural development.

For example, in articulating the need for agricultural education, Kimmel (1982) remarks that according to FAO estimates, in the next 20 years the total number of agricultural extension workers in the world will reach 1.25 million. This is somewhere near four and a half times the current total. The vast majority of these, and other agriculturalists, will have to be trained in their own or neighboring nations.

Certainly, a tremendous education effort will be required if these predictions are even to be partially fulfilled.

One must also consider that in most countries in greatest need of agricultural development, almost all arable land is currently under production (Rojko, 1978). The major constraint to increased productivity is the education of producers in the proper use of improved technologies. Indeed, that is the most plausible path to improvement in the agricultural sector. The technologies are currently available. Their innovative adaptation, adoption, and application are the elements to which agricultural education can greatly contribute.

Agricultural education, as defined herein, can, and does, have a positive impact in technology transfer. Empirical studies support this assertion. Shukla's work among small farmers in India led him to conclude that, "An effective educational program can do much to shorten the time lag between the discovery of a new practice and its adoption by all farmers" (Shukla, 1971, p. 73). Similarly, Mook (1980) utilized an economic production function model to measure the marginal product of education (its effect on the utilization of farm inputs) in a large maize project in Kenya. His research yielded the following conclusions:

Any form of education which imparts knowledge about the production process directly, or which enhances the capacity to acquire knowledge about the production process from other sources, should raise the individual producer's surface of production possibilities. With any particular combination of inputs, the producer with more production-relevant education can (and will) produce more output. (Mook, 1981, p. 738)

These, and other similar observations of the positive effects of education in agricultural projects in developing nations are aptly summarized in the following concept expressed by Ruttan:

Productivity differences in agriculture are increasingly a function of investments in the education of rural people . . . rather than natural resources endowments. Indeed, the one inescapable implication of the results of our cross country analysis is the importance of literacy and schooling among agricultural producers and of technical and scientific education in the agricultural sciences. (Ruttan, 1973, p. 5)

The preceding points clearly both delineate and justify the position that agricultural education has a significant role to play in development. The fundamental rationale is that agricultural sectors in less developed countries can progress only to the extent that the people involved in agriculture progress, and that these people progress significantly only through viable systems of education in agriculture. Granted, other inputs into the sector are also required, but their

use and application are entirely dependent upon the ability of prepared individuals to capitalize upon them. Consequently, the preparation of these people--their education--is crucial since it arms them with the variety of mental and physical skills that efficient modern (as opposed to traditional) agriculture requires.

### The Role

While it is clear that there is a role for agricultural education in development, it is difficult to state or to project to what extent that role will be interpreted and manifest by individual nations in agricultural development programs. However, the question can well be asked, "What role should it rightfully have in a balanced development plan?"

Curle (1970) advocates that in developing societies, in view of their substantial dependence on agriculture, significant attention should be given to the enhancement of education in agriculture. More specifically, he mentions these actions:

- (a) To inquire into the incentives needed to induce persons to train as agricultural scientists and other specialists.
- (b) To study and promote the teaching of science and agriculture at various levels of schooling.
- (c) To give the cultivators themselves as much education in agriculture as possible, both through extension work and, where feasible, through short courses of instruction.

(Curle, 1970, p. 158)

Although Curle presented these ideas more than a decade ago, they are just as applicable today. More recently, the findings of the Presidential Mission on Agricultural Development in Central America and the Caribbean (Presidential Mission, 1980) suggest a similar course for education in agriculture. To summarize, the Commission's recommendations are to: (1) expand educational opportunities in agriculture through strong national and regional education and training programs, and through major in-service training for agriculturalists; (2) strengthen efforts for developing and applying improved technology by initiating major agricultural research programs and improving government extension programs; (3) elevate the prominence of agriculture as a profession, and to provide opportunities and inducement to young people to study agriculture; and (4) initiate programs to educate adult farmers and farm families both in general literacy skills and the use of modern production techniques.

The preceding comments demonstrate that agricultural education can assume a variety of program roles. They are a clear signal to governments in developing nations of ways in which the spectrum of agricultural education can be significantly enlarged to stimulate and support the agricultural sector. Each nation must determine for itself its role for education in agriculture. But, if education is to be an accelerator of

agricultural development, as postulated by Mosher (1966), it must be afforded a sufficient amount of public planning and resources to enable it to truly complement growth (and ignite growth) in agriculture.

### Conclusions

Agricultural education, in the context of international development, embraces a wide range of meanings, for it is any organized activity that has as its purpose instruction in agriculture. It is the process by which specialists are produced, agriculturalists are trained, and farmers are assisted. It is, or should be, a partner with other program inputs in the process of development in agriculture. Given the current economic importance of agricultural sectors in developing societies, agricultural education, in its fullest sense, is thus elevated to a role of great importance.

Development in agriculture must begin with people. Their knowledge and skills are the primary input--the human resource. All other inputs are secondary. Progressive agriculture requires capable individuals at all levels, from the policy maker to the farmer and from the researcher to the extension agent, who are skillful in their professions and who understand the intricacies of agriculture. Indeed, the opportunity cost of not sustaining a strong, diversified, and viable system of agricultural education is too high. Of the many constraints inhibiting agricultural development today, perhaps the greatest is the failure to recognize this fact.

Agricultural education can be viewed as a key, one that can unlock long-lasting benefits. Without it, those benefits may be forever "locked in," never to see the light of day. The hope is that the key will be turned--that it will open a door for developing nations and allow them to improve their contribution to their societies and the world community.

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## The "World Food Situation" As an Initial Lesson Theme In Introductory Poultry Science

S.J. Bowen,  
B. Howarth, Jr. and  
K.W. Washburn

### Abstract

*The "world food situation" was developed as the theme for a three day lesson entitled "Introduction to Poultry Science" in Poultry Science 202 at the University of Georgia. The objectives were: 1) to understand the magnitude of the world food situation 2) to understand the involvement of public policy in this issue and 3) to understand the role of the development of poultry science and the poultry industry in providing high quality low cost food for the world. On the first day a slide tape was presented that described the problem of world hunger and discussed the involvement of public policy in this issue. This was followed by a discussion of the involvement of public policy in the development of the Land Grant College System. The second day continued with a discussion of how Poultry Science Departments function in this system and the contribution made by scientists in these departments. On the final day, there was a discussion of the economic importance of the poultry industry to Georgia and the United States. A slide-tape program presented at the end of the third day demonstrated the involvement of the poultry industry in feeding the world. A quiz was given on the fourth class day. Verbal response of the class at the end of the lesson and written evaluation at the end of the course indicated that the objectives of the lesson were met. Analysis of grades indicated that this lesson had little effect on the final course grade.*

*One of the major issues confronting present day agriculturists is the growing problem of world hunger. This problem is magnified by the increasing opposition of developing world countries to settle for poor nutrition in their human populations. Even though it is an issue important to all of agriculture, few Poultry Science students at the University of Georgia considered this issue in their coursework. For example, the Introductory Poultry Science course (PS 202) encompasses subject areas ranging from endocrinology to management.*

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Bowen is a postdoctoral fellow at Rutgers, Howarth is an associate professor and Washburn is a professor, both at the University of Georgia.