

Quality Improvement in Undergraduate Education

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The second roundtable discussion group focused on issues related to the improvement of undergraduate education in agriculture. For the purposes of discussion, education in agriculture was defined as including all aspects of instructional programs including forestry, fisheries and livestock production. An initial presentation outlined some of the major agricultural education concerns in the developing countries. This was followed by vigorous group discussion that ranged from the relevancy and balance of curricula to the need for improvement in the quality of teaching in many undergraduate programs.

The presentation focused on several major problem areas that were identified as concerns in many developing countries. Major issues that were identified included the following:

- The need to review and revise curriculum in a participatory manner, institutional strengthening and development that is hampered by budgetary constraints, and lack of investment in higher education in agriculture
- The lack of educational policy and planning with a focus on meeting the needs of students
- The need to improve the teaching/learning process at the university level
- The role and potential use of distance learning in agriculture

Participatory Curriculum Development

If we listen to farmers, employers, students, and teachers, it is very clear that a competency-based approach to the teaching/learning process should be considered.

University graduates need to have the skills, knowledge, and attitudes that will bring about the behavioral changes and performance that are needed in the workplace. Rogers and Taylor (1998) stress the importance of involving multiple stakeholders in the development of curricula. The quality of undergraduate education would be much improved with a greater emphasis placed on improving the relevance of curricula and the quality of teaching. In the developing countries, students are no longer guaranteed government employment and the private sector is saying that many of the courses of study are not relevant in a competitive labor market.

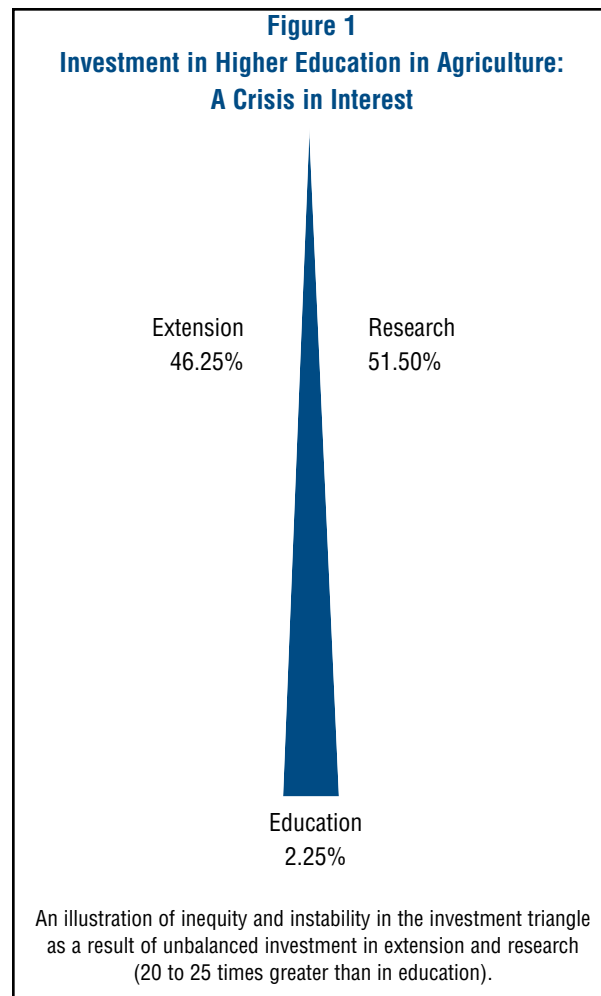
Investing in Agricultural Education

In the recent past, a great deal of attention has been paid to the improvement of research and extension activities, while the development of knowledge and skills in agriculture through education has not been adequately addressed. Willett (1999) states that the World Bank thematic team concerned with Agricultural Knowledge and Information Systems (AKIS) called for a review focused on tertiary-level education. (Tertiary-level was defined as higher education in agricultural, middle-level, and agricultural technical and vocational education and training).

The review identified 13 projects supporting tertiary-level education during the 1987-1997 period, involving a total World Bank investment of some U.S. \$156 million. This amount pales in comparison with Bank support for agricultural research (U.S. \$2.5 billion) and agricultural extension (U.S. \$2.2 billion), respectively, over the same period. By level of education, the Bank supported higher education in agriculture in six countries (U.S. \$108 million), middle-level education in six countries (U.S. \$31million), and agricultural technical and vocational education and training in four countries (U.S. \$17 million). Support for higher education in agriculture, at U.S. \$108 million, involved the largest level of investment. However, of this total, U.S. \$74 million was accounted for by one project in India.

These figures illustrate the imbalance of investment in education in agriculture when compared with funds made available through World Bank loans for agricultural research and extension. At a ratio of nearly 25 to 1, the expenditure on extension and research creates a triangle that is unstable and difficult to justify (see *Figure 1*). An equilateral triangle with equitable investment in education, extension, and research would ensure long-term stability and a steady supply of well-educated young men and women who will be the scientists, researchers, and teachers of the future.

An especially important and often ignored aspect is the role of agriculture in the economies of countries in Africa. In many parts of the world, it is accepted that the contribution of the agricultural sector to the gross domestic product is rapidly diminishing. This is due to the development of industrial, mining, service, and other sectors. In most African countries, however, the contribution of the agricultural sector to the gross domestic product remains high. Therefore, there continues to be a very strong argument in favor of increasing support for agricultural education and rural development throughout the whole of Africa.



Educational Policy and Planning

Today in Africa, tertiary-level education in agriculture is at a crossroads. Financial constraints are severe and the demand for higher-quality education has never been greater. There is a need for greater educational relevance and better-trained graduates. There is an obligation to enroll more women and to produce students who are prepared to go on to positions of leadership. Some progress is being made, but policymakers and educational planners in academia are failing to come to grips with the needs of students and their employment opportunities. A major purpose of tertiary-level education in agriculture is to prepare individuals in the best possible manner for the world of work. Students must be able to integrate knowledge from other fields into their own specialty.

Perhaps most importantly, they must be able to deal constructively with the technological, cultural, and social changes that will challenge them throughout their careers.

Statistically, there is greater access to tertiary-level intermediate and higher-level education, and new courses are being offered in some countries. The quality of those offerings, however, is not reflected in quantitative reporting and problems remain. In many institutions, curricula change has not kept pace with the times, and the quality of teaching leaves much to be desired. Faculty members are getting older and good replacements are hard to find. In terms of quality, graduate study in Africa is at a near low point. The result is a decline in the number of well-qualified young professors who have been educated in their home countries. Instead of building quality in the region, institutions in the industrialized nations are being subsidized to educate Africa's intellectually elite. It is good for the industrialized countries in "the North," but it further exacerbates the brain drain and brings into question the relevancy of the postgraduate courses that are being offered. The development of north/south university partnerships may be one way to address the problem, but it will take new and creative approaches to policy and long-term planning to bring about meaningful change.

The 1995 World Education Report issued by the United Nations Educational, Scientific, and Cultural Organization (UNESCO) shows that enrollment in higher education (third-level) varies greatly in Africa. In the Francophone countries, enrollment ranges from 986 per 100,000 inhabitants in Morocco to 50 per 100,000 in Rwanda. In the Anglophone countries, the range is from 21 per 100,000 inhabitants in Tanzania to 1,636 per 100,000 in Egypt. Enrollment rates for women have made progress in the last 10 years, but they still average from 10 to 20 percent lower than rates for men. Not surprisingly, there is a clear correlation between economic development and the number of students enrolled in higher education. There are a number of countries where low levels of education are accompanied by per capita annual incomes of below U.S. \$500. This includes much of Sub-Saharan Africa.

The Quality Factor

Recent discussions by the Food and Agriculture Organization of the United Nations (FAO) and World Bank concerning improvement in the quality of higher education in agriculture have focused on the need for long-term commitment in order to achieve economic development. There is an immediate need, however, to upgrade academic staff, to improve the standards of students through better secondary education and to strengthen educational policy and institutional management. Postgraduate training to provide high-level scientists and researchers is an essential part of quality improvement. It is also critical that institutions of higher education play a developmental role by establishing linkages with relevant private and public agricultural agencies and with farming communities. Curricula should include important topics that are generally missing, such as the role of women in agricultural development, farming systems management, agribusiness and marketing, environmental protection, population issues and computer literacy. Gender discrimination in enrollment should be eliminated and the participation of women at all levels of educational, research, and extension systems should be encouraged.

At the intermediate level, student demand does not justify building new colleges and schools. Rather, the need is for competency-based education so students can acquire the skills, knowledge, and attitudes that are being demanded by governments and private employers. It is time for private and public partnerships that lead to curriculum revision and improved practical skills of certificate holders and diplomates. The goal should be to produce students who can find and hold jobs because they are well prepared and want to work in the agricultural sector.

It is at the intermediate level that most of Africa's field-level agricultural extension workers are prepared. It is increasingly clear that extension workers need better training in both technical agriculture and the extension methods needed to disseminate production technologies to the thousands of small-scale farmers who need the information. Food security in the low-income, food-deficit countries should be a first priority. The training of extension workers should emphasize skills and knowledge for sustained crop production and strategies for the prevention of food losses during harvest, storage, marketing, and processing.

Distance Learning

In a recent FAO paper, Smith (1999) recognized the importance of developing and strengthening distance learning programs. The FAO will need to continue to develop and strengthen its links with institutes and trainers in developing countries who have experience in assisting groups of learners working on distance learning systems. In countries that lack this competency, there will be a need to help in the development of distance learning capabilities. Recognizing where the comparative advantages of different types of distance learning lie will be important; how to use the proper blend of new and older technologies will also be a challenge. In some instances, a distance learning approach to in-service education and graduate degrees may take the highest priority for the time being.

Interaction between students and their instructors has been an elusive component of distance learning programs as educators have tried to make more effective distance learning available at a low cost. In recent years, the desktop computer has brought a new and exciting element of interactivity to distance learning programs that has never before been available. In the more industrialized countries, computer-enhanced distance learning is now commonplace. In many of the less industrialized countries, computers are still a bit of a mystery and less available for use by students and faculty members.

More reliable telephone lines, less expensive and more readily available computer hardware and better software, the development of e-mail, and access to the Internet have now placed many educators in the position of being able to make distance learning an interactive process at a relatively low cost. The application of modern distance learning techniques for formal and nonformal education in agriculture in Sub-Saharan Africa has tremendous potential. Of particular importance is the potential for using distance learning as a method of extending noncredit information for the in-service training for professors and teaching staff. Intercontinental learning is fast becoming a reality and, in Africa, the leadership potential lies within the university system.

Computers may be considered as a new addition to an already known set of educational tools and methods that present opportunities to test new approaches and combinations of techniques. Computer laboratories for students, the linking of teaching staff through e-mail and the Internet, and the ability to have in place an interactive system that allows students and instructors to carry on electronic discussions have revolutionized the opportunity for more effective distance learning. In-service education that can bring together research staff, university instructors, and frontline extension staff can now be a realistic goal in many countries.

The unfortunate part is that these interactive systems are not generally available in many of the developing countries. More specifically, the systems and programs are not in place to serve education in agriculture in the developing countries where they may be useful in contributing to solving food security problems. Approaches to this kind of education need to be examined and evaluated. The motivational factors, the gender bias that may or may not be present, the importance of relatively low-cost, interactive approaches, and the effectiveness of new and exciting ways to learn should all be looked at in a scientific manner that may tell us that there are better ways to plan and carry out distance learning in agriculture.

References

- Rogers, A. and P. Taylor, 1998. *A Guide to Participatory Curriculum Development in Agricultural Education and Training*. Rome: Food and Agriculture Organization.
- Smith, D., et al., 1999. *Report on Distance Learning, A Development Report*. Rome: Food and Agriculture Organization.
- Willett, A., 1999. *Enhancing Agricultural and Rural Education and Training Systems in Rural Development Strategies and Projects*, (Operational Guidelines for Human Resource Development and Agricultural Education and Training Assessment During Rural Sector Work), Agricultural Knowledge and Information Systems (AKIS) Thematic Team of the Rural Development Family, The World Bank, Washington, DC.

Related Readings

- Blum, Abraham, 1996. *Teaching and Learning in Agriculture: A Guide for Agricultural Educators*. Rome: Food and Agriculture Organization.
- Crowder, L.V., W.I. Lindley, T.H. Bruening and N. Doron, 1998. *Agricultural Education for Sustainable Rural Development: Challenges for Developing Countries in the 21st Century*. The Journal of Agricultural Education and Extension, Vol. 5:No. 2.
- Gooday, D.O.M., 1999. *Strategic Considerations and Actions in Agricultural Education and Human Resource Development in Sub-Saharan Francophone Africa*. Internal discussion paper. Rome: Food and Agriculture Organization.
- Lindley, W. I., 1999. *Constraints and Potentials of Training Mid-Career Extension Professionals in Africa*. A paper prepared for the International Workshop on Innovative Training Programmes for Mid-Career Agricultural Extension Field Staff in Sub-Saharan Africa, Addis Ababa, Ethiopia, July 6-8, 1999.
- Lindley, W. I., et al., 1997. *Issues and Opportunities for Agricultural Education and Training in the 1990s and Beyond*. Rome: Food and Agriculture Organization.
- Maguire, C.J., 1997. *Future Prospects for Agricultural Education Systems*. A Paper for Discussion at the Asian Productivity Organization's Symposium of Agricultural Education Systems, Tokyo, Japan.
- Maxwell, R. and W. Lindley, 1999. *Toward A Balanced Curriculum*. An unpublished discussion paper. Rome: Food and Agriculture Organization.