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From agriculture to rural development: Critical choices for agriculture education

Charles J. Maguire
Senior Institutional Development Specialist
Rural Development Department, the World Bank

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Abstract

Making the leap from a concentration on production agriculture to a focus on rural development presents traditional agricultural education systems with difficult choices. The paper suggests that the choice is not whether to adapt to change but what changes to make. Rural development is a complex process that demands sustainable production agriculture, natural resources management, institutions, infrastructure, health, education, markets, finance, policy, local government, and education in order to succeed. Agricultural education systems from universities to non-formal adult education have to decide how much change they need to make to meet the expectations of an expanded and diverse population of stakeholders and remain relevant. Various authors have, over the past fifteen to twenty years, stressed the importance of institutional reaction to the pressures of change but action has been limited. The paper suggests that increasing competition from other educational institutions and non-traditional sources makes a strong and urgent case for agricultural education systems to make changes in order to influence a wide range of stakeholders including those in academia, in farming and non-farming rural areas, policy makers, and the private sector. The alternative is to become less and less relevant.

What is needed is the vision to sense the future needs of the multiple stakeholders in Rural Development and the leadership and determination to bring about change to enable the institution to educate, train, research and serve for the benefit of the rural community. The paper suggests that the time is right for change initiatives and identifies a number of international organizations and bodies that could be helpful to those contemplating systems change.

This paper is about change. Change we are told is the biological imperative and failure to heed the command can be fatal. Agricultural education is hearing the change imperative and needs to make some critical choices.

We have seen our education establishments develop and disseminate a number of truly momentous scientific advances related to plant and animal breeding, soil and water management, and food preservation. Our education establishments pioneered the development of ingenious labor-saving machinery; and introduced a business management approach to farming. Our education establishments have led the way in providing leadership in

agricultural and rural sector policy formulation and reform. The agricultural education system has been a major contributor to agricultural research, extension, production and institutional successes over the past hundred years. We have much to be proud of but, at the same time, we need to be vigilant for the arena in which our success was won has expanded and changed. Alert members of the agricultural education community have not been unaware of the creeping and sometimes rapid influence of change and have made institutional and organizational adjustments to accommodate and remain relevant. However, we have reached a point where our change response has to be faster and more decisive if we are to survive as an influential force in agriculture and in rural development. Darwin awakened the world to the phenomenon of the survival of the fittest and many agricultural education institutions now face such a challenge. This paper suggests that it is time to take a measured look at the nature of change that surrounds agricultural education and resolve to adapt in order to take back a leadership role in education and training for a much-expanded clientele.

Signs of change

In many parts of the world, especially in Western Europe, North America, Japan, and Australia, the number of family farms has decreased to a level where commentators wishing to make a dramatic point suggest that farmers should be placed on the list of endangered species. Farming communities have shrunk as migration to urban areas has taken place. The size of viable farms in Western Europe, North America, and Australia has grown significantly, and the complex package of knowledge and skill required to make a living from the land includes a combination of plant and animal production, management, finance, marketing, science, and information. Agriculture has become a victim of its own success. Never before has production been so uniformly high yet there are pockets of hunger in both developed and less developed regions. Commodity prices continue to remain weak making the task of survival more difficult for all but the most skilled, resource endowed, and organized farmers. Consumers of agricultural products have changed from being content with a constant supply at a reasonable price to being knowledgeably critical of quality, price, purity and safety (see Box 1).

Box 1: An uneasy public

Critics assert that genetic engineering introduces into food genes that are not present naturally, cannot be introduced through conventional breeding and may have unknown health effects that should be investigated before the food is sold to the public . . . But there is a broad scientific consensus that the present generation of GM foods is safe. Even so, this does little to reassure consumers. Food frights such as "mad cow" disease and revelations of cancer-causing dioxin in food have sorely undermined their confidence in scientific pronouncements and regulatory authorities alike.

The Economist, June 19, 1999

Society at large is conscious of the continuing assault on natural resources as forests disappear, water becomes polluted, or scarce, floods and landslides occur with greater frequency and ferocity and agriculture is classified as a major polluter and exploiter of natural resources. The profile of agricultural education students reflects the influence of change. There are now large numbers of urban born

students enrolled in agricultural programs. The gender balance is more equal in what was a traditionally male area of study. There are decreasing numbers of the best students from secondary school entering agricultural degree programs, and demand for university graduates of agricultural education degree programs is down. Public support for agricultural higher education institutions is weakening. The locus of leadership in agricultural research and extension services to farmers has changed. The private sector has replaced or is replacing the public sector as the leader in making direct contact with the farmer. Private companies do research, produce inputs, run the "factory farms" and make money. Many of those who work for the private sector are not from agricultural education systems but appear to have the ability to make modern agriculture function and keep a reasonable balance between supply and demand for food and fiber. Is the agricultural education community aware of, and reacting to, these changes? Are the agricultural education and training (AET) providers viewing change from the perspective of institutions looking out from the comfort of an apparently safe haven or from the perspective of the client looking in with new demands and expectations? In view of the complex forces and elements which impact on things agricultural and, increasingly, rural do providers of AET fully appreciate that there is a new multi-faceted client population with different needs and very different expectations? Do providers have the imagination and the capacity to service the needs of the new clients? This paper attempts to highlight trends, contrast problems with opportunities and challenge the agricultural education community to develop future scenarios, act quickly or face a future without influence.

The implications of change for agricultural education

There has been no shortage of questions about the effectiveness of the traditional way of providing higher agricultural education and a range of responses has emerged from institutions around the world. We have seen the shift from pure production degrees to a greater emphasis on management, conservation, and agribusiness. We have seen a greater awareness of the need to conserve soil and water and the realization that the traditional agricultural university cannot meet future rural challenges alone (see Box 2).

Box 2: The future of the United States' Land Grant College system

What can we expect to happen to the Land Grant system in the 21st Century? Slowly agriculture is losing its uniqueness. It is leaving the backwater and entering the mainstream, where it will have to learn to navigate. Public support for institutions that serve a diminishing number of people will decrease, as will the number of Land Grant Colleges. The agricultural disciplines - agricultural economics, agricultural engineering, agricultural biology, agricultural chemistry, agricultural business, and agricultural statistics - will gradually be absorbed by their parent disciplines. Agricultural colleges and agricultural courses will lose much of their uniqueness. Their research will become more interdisciplinary and large scale,

> with the agricultural components hard to identify. Agricultural extension will respond increasingly to the felt needs of off-campus people, from whom non-farm matters rank high.p
>
> *Paalberg, 1992*

Hansen (1990) notes that public sector institutions are not subject to the kind of market forces that govern the life of a firm. This is particularly true of agricultural universities, most of which are public institutions. In the absence of conventional market pressures, what might serve to ensure that the university addresses important social needs innovatively and responsively? Or, put in a more crudely negative sense, how does the university avoid stagnating and becoming irrelevant?

McCalla (1998) takes a world-view and warns that the agricultural science system will have to change. Isolated agricultural universities, dominated by the faculty and scientists, simply will not survive. The complexity of the challenge requires access to disciplines far beyond traditional agriculture. The changing role of civil society, participation and decentralization will radically alter the clientele of universities and change the demands on them; and the role of proprietary private sector research will almost certainly increasingly dwarf public sector investments. Falvey (1996) echoes the theme of change by noting that a global reduction in the number of agricultural education providers should be expected. Some rationalization may be seen in courses failing to adapt to changing requirements of funding resources and students. In other cases, it may seem a logical decision from the point of view of university management to fragment small agricultural faculties into their component disciplines within the faculties of science, social science and economics. Willett (1998) highlights the low level of investment in agricultural education and training over a decade of World Bank lending to Less Developed Countries (LDCs) and indicates that new approaches are needed. Engel and Wout van den Bor (1995) suggest that agricultural institutions are in flux. The relatively stable, straightforward institutional development they have known during the years since World War II seems to have come to an end. They no longer automatically form part of the mainstream of technological developments in agriculture. Besides, technical solutions are no longer sufficient. The further development of rural areas, including a responsible management and use of natural resources, requires social, economic, and organizational solutions as well. Moreover, shrinking government budgets and privatization policies affect institutions' resource bases and their accountability vis-à-vis their clients, sponsors and society at large. Ruffio and Barloy (1995) raise the question that must be faced: how can one justify the existence of teaching and institutions specialized in agricultural sciences? The question has validity in the face of frontiers between disciplines disappearing, as demonstrated by the appearance of the bio-sciences - biochemistry, biotechnology, bio-mathematics, and bio-economics. They note that the replacement, or suggested replacement, of the traditional agricultural science degree by biology or bio-engineering diplomas is indicative of current thinking in some universities. Wallace

(1997) notes the uncertain job market for graduates of higher and middle-level institutions which "will mean moving out of traditional production-oriented' agriculture into more managerial, entrepreneurial or non-agricultural occupations. Van Crowder and Anderson (1997) indicate that to maintain relevance, agricultural education institutions are now recognizing that they must play an active and locally relevant developmental role as well as an educational one. Warren (1998) notes that life in tertiary agricultural education is tough, and will undoubtedly get tougher and that others cannot be counted on to help. He suggests that those who do not adapt will fall by the wayside. Paalberg (1992) observes that the experiment stations in the United States, which were responsible for agricultural research, began as almost the sole source of agricultural knowledge. They now share that role with biology departments of the Land Grants and other universities, agribusiness firms, the National Institutes of Health, the National Academy of Sciences, the International Research Network, independent research institutions and numerous agencies of the federal government - not just the United States Department of Agriculture. The discovery of new agricultural knowledge has, he suggests, become interdisciplinary, long-term, and expensive.

New horizons for agricultural education

Virtually all commentators on the future of agricultural education stress the need for broadening purely production- focused programs in order to encompass rural development challenges that reside outside agriculture or are closely linked to it. When we envision rural development what do we see? The World Bank's strategy paper for rural development titled From Vision to Action (1997) noted that Rural Development encompassed all activities outside urban areas related to development. The strategy paper indicated that in future the Bank would be *taking a broad rural focus, as opposed to a narrow agricultural focus.* "The rural sector strategy focuses on the entire rural productive system. Water resource allocation and comprehensive watershed management incorporate irrigation and drainage. The management of natural resources in sustainable production systems treats agriculture, forestry, and livestock as part of a larger system. Human capital development, infrastructure, and social development are integrated into rural development strategies and programs."

Cleaver (1999) advised that to successfully support Rural Development the World Bank should in its lending expand the substantial content of non-agricultural rural development by giving equal weight in rural development strategy to rural education, health, infrastructure, non-agricultural economic activities, administration, community development. The Bank should also elaborate how governments, donors, the Bank will support investment in these activities. Some suggested interventions included:

- Rehabilitating integrated rural development programs

- Developing useable models of rural content for national education, health, and infrastructure programs.
- Developing national community development programs with rural focus
- Establishing Rural Social Funds
- Elaborating sub-sector investment Elaborating sub-sector investment and policy models of rural infrastructure, rural health, rural education, rural administration, and rural community development

Wallace (1997) suggests that, in addition to specific skills, rural people are also seeking education for life which includes leadership development, confidence building and problem solving.

Hansen (1990) broadened the focus of agricultural education by noting that universities neglected the important policy and institutional variables that set the course and defined the parameters of rural change. Universities had been slow to explore how different rural strategies might enhance the generation and distribution of employment and income; strengthen the income-earning capacities of resource-poor households; improve the management of soil, water, agroforestry, and common property resources; and increase efficiencies, as well as equity in product and credit markets.

Britz (1998) also sees the importance of universities seeing agriculture in a broader sense and providing leadership for new stakeholders who represent the interaction between urban and rural cultures. He notes that farmer's political power diminishes and so does support for agricultural programs. However, urban people want resort areas, national parks, peri-urban and even urban agriculture. Greening of cities, preference for organic products or green political parties. Agricultural universities should analyze this movement with teaching and research activities, organizing seminars and discussion groups.

Falvey (1996) suggests that the dual concern for the environment and the need for increased food production provide a context for future agricultural education. Existing courses mainly take a balanced scientific approach - to this there would appear to be a need to include a greater input from the humanities including an understanding of environmental ethics. The imperative to produce food, as far as we know to-day, will continue to rely on continued intervention in the natural environment. In accepting the responsibility to manage the environment with care, agricultural education may need to see itself as a field of natural resources management -managing the natural resource base (soil, water, mined fertilizers and so on) to produce food while understanding the interaction with that resource.

FAO (1995) suggests that the responsibility of the schools of agriculture should not be limited to turning out a professional elite with a strong scientific background but lacking the humanism essential to work in the social environment.

Rural development takes place in a complex environment

In order to bring about significant change, reformers of agricultural education institutions or systems must appreciate the complexity of the environment in which a shift in focus from agriculture to rural development would take place. Within the rural development universe there are attractive and compelling activities which can be added to or incorporated into traditional agricultural education programs but many times these are selected not from a clear understanding of their place in that universe but for other reasons. Bawden (1998) offers a diagrammatic explanation of how the agricultural education and training (AET) system fits into the complex rural development system and how both of these systems are influenced by the wider environment in which they exist.

First, agricultural education is viewed not from a single perspective such as higher, secondary, vocational or adult but as a system. The Agricultural Education and Training (AET) system can be viewed as being composed of four inter-related sub-systems (Figure 1).

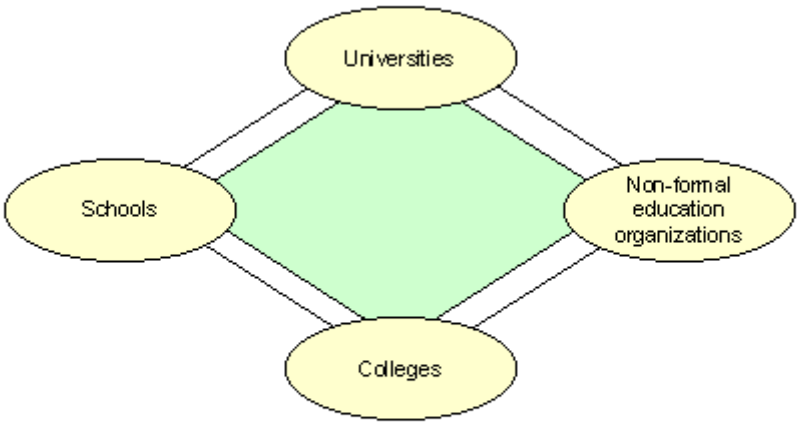

Figure 1: The AET system and its component sub-systems

The AET system is itself a sub-system of the higher order (agriculturally focussed) system (or bounded network) of rural development (Figure 2) which includes the clientele, organizations and institutions in both the private and public sectors, and both non-government (NGO) and community-based organizations (CBO).

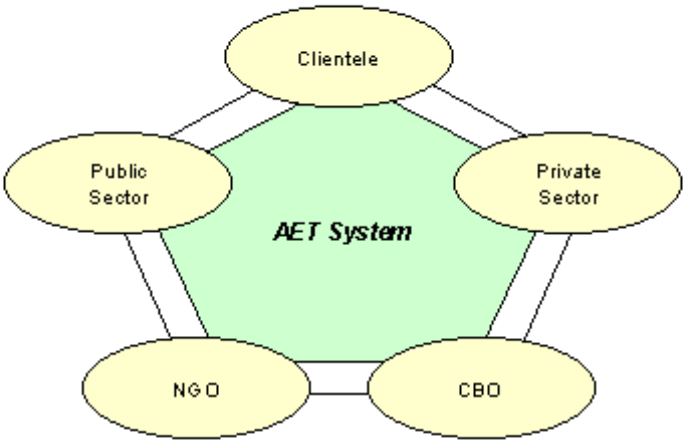

Figure 2: The AET system as a sub-system of the rural development system

The complexity of the term Rural Development can be appreciated when it is understood that each of the other sub-systems in the rural development system is also comprised of a complex set of interconnected elements. The clientele sub-system, for instance, can be seen to comprise seven inter connected sub-sub-systems (Figure 3).

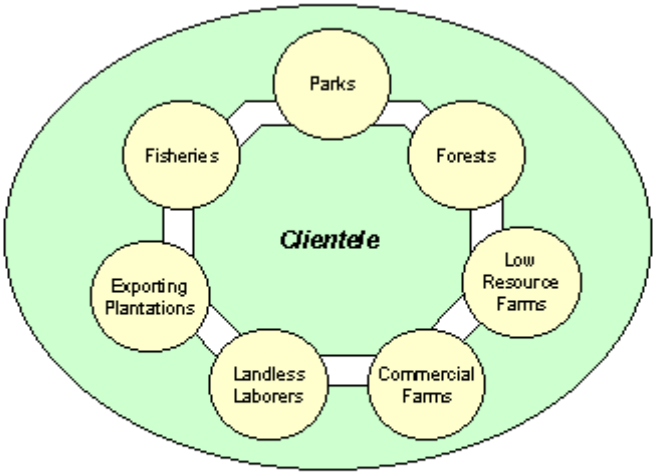

Figure 3: The Clientele sub-system of the natural resource component of the rural development system

The Public Sector sub-system meanwhile, has sub-sub-systems concerned with policy, infrastructure, research, development, and extension., while the Private

Sector comprises financial institutions, input companies, marketing companies, manufacturing companies, the media, etc.

The whole Rural Development System meanwhile, with all these component sub-systems, itself operates within an environment of immense complexity which is characterized by a host of factors which can influence, and be influenced by, the rural development system (Figure 4).

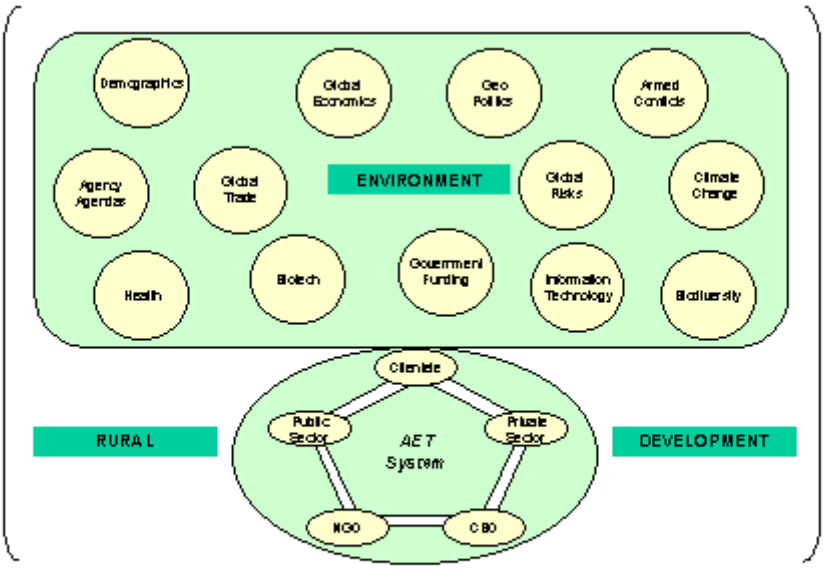

Figure 4: The rural development system and aspects of the environment in which it must operate

Taking a system-wide view of AET

We focus on higher education as our area of enquiry but increasingly we find it more difficult to separate out the various levels of education and training delivery in the pursuit of rural development. Higher agricultural education is, of course, a keystone in the system for it represents the locus of leadership- generation in policy-making, agricultural research, agricultural extension, production farming and teaching. We are correct in looking to higher agricultural education as the frontrunner in meeting the challenges of the future but we have to recognize that the neat divisions, which made our higher education focus legitimate, no longer hold. We know that one of the most critical job categories in agriculture to-day is that of the technician who can manage a farm, run a processing plant, repair agricultural machinery, market farm products, and provide goods and services. This essential category is not separate from the concerns of University level education. We see a decline in the teaching of agriculture in secondary schools where there are significant gains in the teaching of environmental principles. Surely we should be concerned that the place of agriculture in society and its economic, social and environmental role needs to be made clear to those who will shape the world in the early part of this new century. We cannot ignore the rising interest in rural

education and in the search for links between rural and agricultural education (Sariego,1999). We have to be conscious of the increasing numbers of part-time students who seek knowledge and information related to agriculture and natural resources. We must view higher agricultural education as one element in an increasingly important system as we deal with rural development issues. It should be recognized that a shift in thinking to a systems approach will not be easy for all. Bawden (1998) suggests that a systemic perspective presents a complex challenge to those accustomed to thinking of agricultural education and training in terms of publicly funded universities focussed essentially on serving the needs of export oriented and commercial producers. Such institutions rely on publicly funded research and extension activities, and operate within relatively stable natural and social environments.

Donor support and agricultural wducation systems

For too long the focus of international donor agencies has been on elements of the AET system. The World Bank, in the twenty-six years between 1963 and 1989, supported agricultural education in sixty-seven of its 135 higher education projects. As a 1992 World Bank Review notes, agricultural colleges and universities were among the first education institutions to receive Bank assistance, and the Bank itself was among the earliest multilateral donors to support these institutions. Bank assistance was based upon the need to supply technicians to support the science-based agriculture, which was to play such an important part in increasing food security and promoting economic development. Governments looked to these higher education institutions to produce the technical personnel, managers, teachers, researchers, and extension workers required to staff agricultural agencies. It is now clear that the emphasis of these investments was on an element of the system , the higher education element, but not on the system itself. Willett (1998) noted in his review of agricultural education support by the World Bank and other donors in the decade 1987-1997, that past investment tended to emphasize bricks and mortar, hardware and faculty overseas training to build AET programs focused on state-led support services for production agriculture. The review identified the need to shift the paradigm for AET toward a much broader, multi-disciplinary systems approach. New generation AET projects need to develop human capacity, not just for production agriculture, but for environmentally and socially sustainable development throughout the rural sector, engaging more diverse, rural sector-related systems through a multiple field of partners and stakeholders.

Responses to the challenge of change

As previously observed, there have been institutional responses to the pressures and challenges of change and many of the responses have had positive impacts on aspects of higher agricultural education. A sampling of such responses serves to reflect the breadth of thinking about the future needs of the sector and how to meet these needs.

McCalla (1998) suggests a curriculum for the future at bachelor's level that would offer intensified production systems on two tracks. One would have a biological-physical emphasis, the other, a social-economic emphasis. All students would, in the first two years, be well grounded in fundamentals- mathematics, chemistry, physics, biology, history and philosophy and logic as well as modern information systems. Those on the biological/physical track would take a third year of molecular, cellular, physiological and systems biology; biochemistry; genetics; and anatomy and morphology. Those on the economic/social track would take a year drawn from anthropology, sociology, economics, political science, history, statistics and quantitative analysis. After the third year all students would begin the process of integration by a course of study focused around ecological and social systems. Using integrated production systems as a model- the program should focus on cross-cutting themes such as:

- Conservation tillage
- Integrated pest management
- Integrated nutrient management
- Conservation, ecology, bio-diversity
- Biotechnology

In addition, they would focus on farmer-farming system interactions and on farmer-village-social system interaction. All students would require an understanding of the importance of policy and institutions.

A fifth year would engage students in a field project as well as learning a foreign language.

The Master's curriculum would build on the field project of the fifth year of the bachelor's program allowing the students to focus more in depth on critical components of the cross-cutting themes. The program at doctorate level would be basically focused at the discipline level. The doctorate should remain a research degree.

Ruffio and Barloy (1995) propose three principles which should guide decisions regarding student's future education. A strong basic scientific training, sufficiently broad-based to give future graduates a high capacity for abstraction, methods of reasoning and a greater facility in building theoretical concepts, explaining and stating terms of a problem and expressing technical questions in scientific terms. A more limited technical training, crucial indeed but not aiming at encyclopedic knowledge. The development of personal qualities essential in position of responsibility: communications and managerial skills, ability to organize and adapt and to work hard. Wallace (1997) notes curriculum weaknesses in Africa which include a failure to embrace emerging global issues such as sustainability, the environment, gender, farming systems development and suggests a slowness in

incorporating more transferable skills such as languages, computer studies, communication, marketing, and entrepreneurship.

In the United States, which boasts a unique and much admired agricultural education system concern about the future led to the formation, in 1995, of the Kellogg Commission on the Future of State and Land Grant Universities. The commission, funded by the Kellogg Foundation, was created to rethink the role of public higher education in the United States and had a time horizon of four years. The Commission was created in response to a public perception that the Land Grant system was out of touch and out of date and that expertise on campuses of the system was not able to focus on local problems. The commission concluded in 1999 that the system needed to go beyond outreach and service to `Engagement'. By engagement is meant a redesign of teaching, research, and extension and service functions to become even more sympathetically and productively involved with their communities, however community may be defined. Embedded in the engagement ideal is a commitment to sharing and reciprocity. The Commission envisaged partnerships, two-way streets defined by mutual respect among the partners for what each brings to the table. The Commission decided that the engaged institution must accomplish three things:

- It must be organized to respond to the needs of to-day's students and to-morrow's, not yesterday's
- It must enrich student's experiences by bringing research and engagement into the curriculum and offering practical opportunities for students to prepare for the world they will enter.
- It must put its critical resources (knowledge and expertise) to work on the problems the communities it serves face.

In parallel with the Commission and again with the support of Kellogg Foundation funding a national group undertook a multi-year (1996-1999) review of secondary level agricultural education with the task of Reinventing Agricultural Education for the year 2020. The motivation was similar to that which spurred the Commission, a fear that the secondary, Vocational Agriculture, program no longer reflected the needs of rural America and the challenges of globalization and that unless it redefined itself it would be irrelevant in the education system. The outcome of the review suggests that "the work begun in this initiative (Reinventing Agricultural Education) prepares us to deal effectively with changes in food production, environmental stewardship, human health, technology and the global economy."

In Australia, the University of Melbourne, undertook a rationalization of the state system by uniting the university and a number of colleges in a single system.

A recent OECD Conference (1999) concluded that governments have tended to bring policy making for research, higher education and development/extension for agriculture and food into closer connection with general public policy for the

development and provision of research, education and development services to their societies as a whole.

University College Dublin now has a Department of Agribusiness, Extension and Rural Development offering nine specialized degree programs. From the traditional Bachelor of Agricultural Science degree which focused on production agriculture there is now a choice of Agribusiness and Rural Development, Agricultural and Environmental Science, Animal and Crop Production, Animal Science, Commercial Horticulture, Engineering and Technology, Food Science, Forestry, and Landscape Horticulture. This major change from the traditional program was sparked . At postgraduate level, in addition to Masters and Ph.D. by research , the Department offers a Masters in Rural Development and a Higher Diploma in Rural Development. There is a continuous feed back on the effectiveness of degree programs from employers and graduates as a way of detecting change.

Choices for the future

Delbertin (1992) offers three options for the way agricultural education universities can face the future and speculates on the consequences of each.

- **Continue to primarily serve commercial farmers**

Continue to devote most resources to output-increasing technical production research and rely on early-adopting farmers and their commodity groups for primary political support. This is risky alternative given the declining number of commercial farmers, the decreasing comparative importance of the commercial farming sector, and the potential erosion of political support for output-enhancing agricultural research by politically more important groups such as urban consumers and environmentalists. The traditional target group cannot sustain agricultural research funding and downsizing must follow.

- **Build a political support group among consumers**

Continue emphasis within agricultural colleges (universities) on increasing output, but broaden the political and funding support base by embracing consumers who benefit from agricultural research in the form of lower food prices and a safer, higher quality food supply. Consumers, not farmers nor their commodity groups should be the political support base for the lion's share of agricultural research funding. Administrators have to seek out consumer advocates and provide them with opportunities to contribute to the setting of research agendas similar to that now given to traditional agricultural constituencies. Low income people would be the major beneficiaries of this research.

- **Emphasize the problems of non-farm rural residents and non-commercial farmers**

The third alternative is to redefine the mission of agricultural colleges (universities) to focus primarily on improving the well-being of all rural residents, farm or non-farm. Many would argue that this is now the case but a genuine focus will require substantial relocation of funds away from output-expanding research, and toward social and economic research dealing with the problems of non-farm rural people, poor as well as rich, and farmers that have not been a major source of political support for agricultural research. These include part-time farmers, organic farmers, and farmers with limited financial resources for adopting new technologies.

Consequences of these the second and third options could be that social scientists interested in improving the well-being of non-farm rural residents and farmers in these other categories could strongly influence the research agendas at agricultural colleges (universities). This option will meet with opposition from technical production scientists and early adopters. It is clear that as the number of commercial farmers declines, agricultural college administrators must build a broader political base of support to these other groups. Conflicts between what consumers want (as well as environmentalists, organic farmers and animal rights activists) and what is politically powerful and commodity-oriented commercial farmers want will be the primary administrative agenda item over the coming decade. Bringing both rural and urban consumers into the political support base cold also have a high long run payoff in state and federal support for agricultural research. But first, consumers need to be convinced that they, not farmers, are the ultimate beneficiaries of most of the gains from agricultural research. Building coalitions will not be easy.

Partnerships

Advocates of change make the point that partnerships will be needed if progress is to be made. Partnerships within agricultural education systems; partnerships between agricultural education systems and larger education systems; partnerships with the private sector; partnerships with a range of other stakeholders including employers, non governmental organizations (NGOs), ministries representing other sectors, farmer's organizations, environmental groups, and consumers of farm products and services.

Topel (1998) notes the downward trend in financial support for agricultural research, extension and teaching in the United States and suggests that in order to achieve national and international recognition for quality research, teaching, and extension programs, funding from private individuals or companies is essential. Press and Washburn (2000) report that corporate giving to education is on the rise, growing, in the United States, from $850 million in 1985 to $4.2 billion less than a decade later. They also note that increasingly the money comes with strings attached.

Risks

If it is inevitable that Agricultural Universities and other higher education institutions dealing with agriculture and rural topics need to enter into partnerships with private businesses what are the risks that should be considered? (see Box 3) The biggest is that rural investments without the potential for profit may be ignored and neglected. Professors worry that universities will cease to serve as places where independent critical thought is nurtured. For example, raising questions about the safety of genetically altered crops may prove difficult if more and more agricultural colleges turn to corporations to finance their research (Press and Washburn 2000). The lesson from the American experience with partnerships is that the bigger partner may set agendas, influence the end product and, at the end of the day, be the big winner. The losers are the students and society at large who are deprived of a broader but non profit-making education and the curiosity that goes with research and developing an understanding of the world as it is. If we cannot avoid a one-sided partnership route to survive in an increasingly competitive education world maybe we should leave the non profit generating rural issues to others? Ruffio and Barloy (1995) suggest that in Central and Eastern Europe universities should become active partners in local and regional development, in partnership with local authorities and professionals from the business world, within structures yet be to be created. Press and Washburn (2000) ask the critical question: "In an age when ideas are central to the economy, universities will inevitably play a role in fostering growth. But should we allow commercial forces to determine the university's educational mission and academic ideals?" W. van den Bor et. al. suggest that as long as institutions for higher agricultural learning are forced to attract more and more outside funding, they will not be able to afford the "luxury" of making clear and relevant choices about their societal mission.

Box 3: A word of caution

Universities need to diversify their sources of information, enter into strategic alliances, be experimental, and mix boldness with prudence; they should also remember who must be in change. The university must serve the future job market, not be a slave to it. There is a need to seek new relationships, not to give up one's ultimate responsibilities.

Dlamini, 1999

The idea of partnerships within the greater education system may cause problems for established staff and institutions. While we like to think that partnerships are of the win-win variety it is clear that some wins are greater than others. It may be difficult for some agricultural education staff to give up identity by teaming with another academic program and similarly difficult for long established departments or faculties to face merger and loss of traditional "brand name". In the most critical circumstances the choice may be between merging and disappearing.

Why should we be concerned?

If the pressures for change are so great and if a future where the agricultural education that we know will be inevitably lost in a new and larger fabric of education for rural development why should we expend energy on dreaming up future scenarios? Perhaps we should resolve to shape the future rather than allow it to evolve in ways that may not reflect our judgement on how best to proceed. We have a proud tradition of contributing to the phenomenon of a very successful international agricultural industry, which has confounded the dire predictions of Malthus and others. Ours has been a major contribution in the areas of knowledge generation through research, education of countless thousands of personnel for the public and private sectors, agribusiness, production agriculture, and policy formulation. We have been the anchor for an agriculture when it was considered a way of life, and, later, when agriculture was recognized as a business. Now that the profile of agriculture has changed, to reflect demography, biotechnology, a greater emphasis on natural resources management, and a concern for the environment, we are in the best position to take a lead as the intellectual leaders and the developers of human capital for the next century? Not only is there an opportunity to claim a leadership role, there is also an obligation for as Conway (1997) reminds us there are some three-quarters of a billion people chronically undernourished and this figure is not likely to change over the next twenty-five years. If progress is to be made in reducing the numbers of undernourished we have to fill severe gaps on our knowledge. He suggests that scientists need to provide a better understanding of the genetic basis of yield, of such key processes as photosynthesis and nitrogen fixation, and of the responses of plants to stress, and to show how this knowledge can be exploited in conventional plant-breeding and genetic engineering. Further, we need greater understanding not only of the ecological underpinnings of integrated pest, disease and nutrient management, but also of the economic and institutional requirements for success. And, he concludes, this is equally true of how we manage our natural resources: rangelands, forests and fisheries. The World Bank (1997) adds to the picture of the challenge to education when it states: we must improve the efficiency of land, water, and chemical use if we are to feed the world's population, expected to exceed eight billion by 2025, without destroying the environment.

Surely this is a challenge worthy of our best efforts and we should be willing to make the educational and institutional changes necessary to meet that challenge. And there is more. Our role must be further defined as the link between the rural and the urban spaces which make up our planet. We have a role in promoting what has become a knowledge intensive sustainable agriculture with inputs for producers and education and information for consumers. We have a goal to educate and train those who protect natural resources and to provide models of effective and efficient natural resources management. Finally, our role as knowledgeable spokespersons for rural development is critical for obtaining government and other support for ensuring that sustainable agriculture can hold its own in a global market-place.

Challenge revisited

Can the agricultural education community ignore the increasing volume of advocacy for change in the way we view our roles; in the way we position ourselves to serve a new sector reality; in the way we join with others in maximizing our contribution to society's understanding of agriculture's role in the development process; and in the way we govern ourselves? The question must no longer be whether we espouse change but what type of change and how much do we support? As we have seen from the wide-ranging comments of change advocates, the menu is vast. Too vast for any one institution to tackle alone, too vast for most agricultural education and training systems to fully take on board.. We have to recognize that change is not easy in many systems. Csaki (1999) reminds us that the content of change is not necessarily the same in all regions of the world but is context specific. We also know that the dulling influence of some bureaucracies provides little room in which advocates of change can operate. Hansen (1990) noted three areas where many agricultural universities lacked control:

- Enrollment: where admission policies are controlled by outside government agencies which frequently encourage rapid increases in enrollments without ensuring funding increases to match the expanding numbers
- Programming: where curriculum policy is under the control of a central outside agency, which leaves the university or other education and training institution little if any latitude or incentive for undertaking curriculum innovation.
- Financing: most universities have very little control over the structure of their finances and in many cases the fee structure and faculty salaries are set by an outside agency. Budgetary flexibility is limited and income earned is returned to the Government treasury

Taking the plunge

We can continue to focus on parts of the AET system and indeed improve quality up to a point. For example much is written and spoken about the virtual university and its potential for linking best practices and practitioners from anywhere in the world to enhance university programs and learning in general. This is a technological application of great potential but it does not answer the immediate question of what is the university, in a system context, going to do about Rural Development. How far will it move from traditional approaches, how far is it willing to partner, to become, in some cases, the junior partner, and how serious will it become about taking the message of agriculture, food and fiber, and sustainable development to society at large? If we are convinced that a change initiative is necessary and that action needs to be taken quickly there are a number of initiatives gaining strength which can provide a valuable support network .

The Global Consortium of Higher Agricultural Education and Research founded in 1998 with the goal of fostering global cooperation for the improvement of higher

education and research for agriculture as a prerequisite to solving the food security and environmental problems confronting our world. The consortium aims to serve institutions with programs in agriculture, veterinary medicine, and natural resource management, including the biological. Physical and social sciences dimensions of these fields. The consortium founders designed it to be helpful to institutions worldwide that are working to make significant reforms in their systems of higher agricultural education.

The Standing Forum for Discussion on the Integration of Agricultural Education in the Americas sponsored by the Inter-American Institute for Cooperation on Agriculture (IICA) was established in 1999 with a conference at the Organization of American States (OAS) in Washington D.C., United States. The purpose of the Forum is to help position agriculture and, in particular, agricultural and rural education and training, on the work agenda of political and financial entities and to support modernization efforts and facilitate integration among institutions and countries.

The Organization for Economic Cooperation and Development (OECD) through its Directorate for Food / Agriculture and Fisheries held a January 2000 Conference of Directors and Representatives of Agricultural Knowledge Systems (AKS) from 22 OECD countries. The AKS encompasses Agricultural Research, Extension, and Higher Education. The January 2000 Conference noted that most countries see exciting challenges for Agricultural Knowledge Systems (AKS) to contribute strongly to the newly developing societal interests that are wider than traditional agriculture. Mechanisms to encourage, stimulate and reward both institutions and individuals to engage in innovative interactive research, teaching and development work in these new areas still need further development. Many countries, however, identify the limited contribution that AKS has made in recent years to public debate and policy formation as a major weakness which has to be overcome.

The Food and Agriculture Organization of the United Nations (FAO) has an ongoing program on agricultural and rural education and training particularly concerned with the need for reforms and well reasoned responses to the pressures of change.

The World Bank through the Agricultural Knowledge and Information Systems (AKIS) thematic group in the Rural Family has been working for a revival of interest in agricultural and rural education since 1998. AKIS sponsored an international workshop at the World Bank in late 1999 with the theme: Education for Agriculture and Rural Development: Identifying Strategies for Meeting Future Needs. The Workshop identified a number of Researchable Questions that needed to be answered if the donor community is to make a case for future investments in agricultural education systems.

A number of bilateral donors have been active in supporting innovative agricultural education projects over the past ten years and were identified by Willett (1998).

The Kellogg Foundation support to the US Land Grant Universities in positioning themselves for the future has already been cited as has the parallel Secondary Agricultural Education reinvention exercise.

Key elements in meeting the challenge of change

There are two key elements required to bring about change in agricultural education systems; Vision and Leadership.

Bawden (1998) identifies weak leadership and inappropriate conceptual maps for the development process as a cause of crisis in AET systems and in the broader domain of agriculture and rural affairs. He indicates that where previously the agricultural education and training system (AET) emphasized providing skilled manpower for techno-scientific production agriculture to assure food security, the emerging focus is on developing and promulgating an environmentally sustainable, socially equitable, and ethically defensible agricultural development process that fosters the wellbeing of rural communities and of the biophysical and socio-cultural environments in which they live. To deal with this complex situation Bawden suggests that leaders of AET systems will need to learn how to envision plausible futures (see Box 4).

Box 4: Elements of reform

Reform in any university anywhere in the world cannot occur unless there is a vision passionately believed in and furthered by leaders. If we want change or reform, it will not happen casually or simply by its bubbling up within a university. There may be ferment for change and a desire for adaptation. But change will not occur unless there are leaders willing to step up and step out and provide direction and articulate a vision that can unite men and women to work for needed change, building on the accomplishments of the university and its history, but pointing unequivocally to the future.

Magrath, 1999

McCalla (1998) asks if the global agricultural science establishment as currently constituted meet the challenge? Possibly, but only if radical changes are initiated now, new partnerships, particularly with the private sector, are initiated soon, and if the agricultural establishment gets out of its isolationist shell and joins the global science community.

We recognize that educational institutions are conservative and slow to change. Paalberg (1998) reminds us that we should not overlook that institutional lag and rhetorical lag serve a useful purpose: providing needed continuity. If we responded

fully and quickly to technological change, society would be in disarray. While the pace of change in our institutions and rhetoric has been too slow, some lag does permit accommodation without inducing chaos. Technological changes are the wing feathers, propelling us forward, while institutions and rhetoric are the tail feathers, keeping us on course. Both are needed if we are to fly. This is sage advice but regardless of the pace of change we need to know where we are going and we need the leadership to take us there for a safe landing.

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