Innovative Extension Education in Africa

Sasakawa-Global 2000

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Second Workshop on Training Mid-Career Agricultural Extension Professionals

Papers from the International Workshop on Innovative Training Programmes for Mid-Career Agricultural Extension Professionals in Sub-Saharan Africa held at the Red Cross Training Institute, Addis Ababa, Ethiopia, July 6–8, 1999.

Steven A. Breth, editor

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Contents

Foreword

This international workshop on extension education was held in Addis Ababa and sponsored by the Sasakawa Africa Fund for Extension Education (SAFE) in collaboration with Winrock International and Alemaya University of Agriculture. It is the second such meeting. The first was held in 1995 at the University of Cape Coast in Ghana.

The Addis workshop attracted more than 70 professionals from 15 African countries, including vice chancellors and rectors, deans, and department heads; senior officials from ministries of agriculture and education; and various subject-matter specialists. Its purpose was to accelerate the establishment of innovative university and college courses for upgrading the academic credentials of African extension workers. Five African universities and colleges have expressed interest in developing new courses for extension professionals, in addition to the five institutions already engaged in such instruction.

Even with significant government down-sizing, the nations of sub-Saharan Africa employ at least 100,000 extension workers. Two- thirds of them have academic qualification of a certificate or less. Their skills in agricultural production, market development, and extension communication need to be strengthened. In addition, extension workers with lower formal qualifications, who begin their careers in the field, are seldom able to rise to supervisory positions, despite their first-hand experience with farmers and farming, unless they receive advanced training.

Handicapped by inadequate funding and outdated curricula, extension education is an especially neglected field in Africa. Most agricultural universities are not engaged in upgrading the skills of research and extension practitioners or developing better-prepared professional agriculturalists for the future. Most remain on the sidelines of national rural development programs, despite considerable human talent. We believe that getting faculty off the campus and into communities offers high potential payoffs to the nation and to pre-service teaching as well.

Since 1993 the Sasakawa Africa Association has worked with extension educators from Winrock International and a growing number of African universities to develop innovative extension programs for mid-career extension workers. The University of Cape Coast in Ghana was the first to establish such an innovative course. Similar courses have begun at Sokoine University in Tanzania, Alemaya University of Agriculture in Ethiopia, and Makerere University in Uganda.

In 1999 a new 2-year diploma course was started at Kwadaso College in

Kumasi, Ghana, for early-career extension staff. This course—which is receiving support from University of Cape Coast extension faculty—adds a vital step in a career-learning path for extension workers, because the diploma is the first step beyond the certificate, which most African extension workers hold. It is hoped that Kwadaso will serve as a model for similar diploma courses in other countries. Graduates from the diploma course, after returning to work for several years, will be eligible to enroll in the 2-year, post diploma program leading to a B.Sc. in extension.

SAFE's capacity-building efforts in African universities are not only highly appreciated by our partner institutions, but also by our donor, the Nippon Foundation of Japan. As a consequence, we anticipate increased funding for SAFE's work in the coming years. Obviously, our first priority will be in countries where SG 2000 has field programs under way with ministries of agriculture. However, we also hope to persuade other donor organizations to commit funding to higher education courses of this nature.

Finally, for the Addis workshop, special thanks go to Deola Naibakelao, SAFE director, and Moses Zinnah and Jeff Mutimba of the SAFE-Winrock program for organizing the workshop, to the Winrock office staff in Addis Ababa for their logistical support; to Roger Steele, assistant professor of agricultural education at Cornell University, for setting up the working group sessions and for editing the working group reports; and to Steven Breth for editing and producing this proceedings.

Christopher Dowswell
Director for Program Coordination
Sasakawa Africa Association

Introductory Remarks

Marco Quiñones

Sub-Saharan Africa has a larger share of its population in rural areas than any other world region, and most of its rural population is engaged in agriculture. But poverty, food insecurity, and degradation of the natural resource base continue unabated despite of sub-Saharan Africa's large farming population. Famines that cause catastrophic losses of human lives are not uncommon.

To arrest these problems, the critical role of agricultural intensification as the engine of broader economic growth is becoming increasingly clear to African governments and leaders.

But it is also evident that for agricultural intensification to take place, serious attention must be given to education, agricultural research, and extension, along with conducive policies in each country.

In working with research and extension in sub-Saharan Africa for the last 14 years, it is our experience that one of the major problems facing the extension services of the region is the low level of staff training as compared with the training of their research counterparts. This lack of proper training hampers research-extension linkages and results in a slow diffusion of technology to farmers.

Extension practitioners in the region are always eager for training opportunities that would enable them to carry on their jobs more efficiently. It is well documented that more that 75 percent of the extension staff in sub-Saharan Africa hold only a certificate in agriculture after completion of secondary school, and for most of them the possibility of continuing their education is practically nonexistent.

African universities and colleges have an important role to play in improving the knowledge base of agricultural extension services and meeting the growing need for developing responsive training programs for seasoned extension staff who are already working with farmers. But agricultural universities and colleges cannot do this alone. It will require partnerships between all concerned stakeholders including governments, NGOs, the private sector, donors and bilateral agencies, and, most important, the farmers as the end users.

In 1993, in response to this need, the Sasakawa Africa Association created the Sasakawa Africa Fund for Extension Education (SAFE) and, in collaboration

Marco Quiñones is the SG 2000 director for Ethiopia.

with Winrock International, initiated a program to help selected African universities and colleges reform their extension curricula to meet the training needs of mid-career extension staff. At present, four universities are involved in the SAFE program: the University of Cape Coast in Ghana (1993), Alemaya University of Agriculture in Ethiopia (1994), Makerere University in Uganda (1997), and Sokoine University in Tanzania (1998). Other universities may soon join this selected group.

To devise a practical framework for funding, to continue to develop and implement responsive extension curricula in African universities and colleges, and to foster networking and sharing of experiences, Sasakawa Africa Association, Winrock International, and Alemaya University of Agriculture have organized this workshop.

Specifically the objectives of this workshop are to:

- critically review the constraints and opportunities in training mid-career extension professionals in Africa
- share experiences on innovative extension training programs in African universities and colleges
- devise a practical framework for funding, developing, and implementing innovative training programs in African universities and colleges for mid-career extension staff
- explore the future of the SAFE initiative and make recommendations
- foster partnerships and networking among all stakeholders

Welcome Address

Belay Kassa

I bring you a warm welcome from Dr. Desta Hamito, president of Alemaya University, who is not able to be with us today because of a pressing commitment overseas. Nonetheless, his heart and soul will be with us throughout the workshop, which he was so interested in and personally took so much pain to organize.

As Alemaya University, we feel privileged to be able to host such an important workshop, bringing together participants from as far afield as Mexico, Japan, USA, Italy, United Kingdom, and from all over Africa.

Your presence here is a clear testimony that we are not alone in the search for innovative ways of promoting agricultural development through the provision of well-trained human resources that are adaptable and able to deal with the ever-growing challenges of the industry.

We are proud to have you here because we feel we have something to share with you. We are proud because we are among the first in Africa, and as far as I am aware, in the world, to experiment with innovative training programs for mid-career agricultural extension professionals. We are also one of few universities in Africa with a full-fledged Department of Agricultural Extension. This stems from our strong belief in the role of extension in agricultural development.

Whereas many universities believe agricultural extension skills can be acquired in the field, we believe we have a strong role in providing and developing these skills.

During the workshop, you will hear more about our experiences with the innovative program for mid-career extension professionals. I am happy to note that some of you will be joining us to witness the graduation of the first group of this program on July 10, 1999, which means we have come one full cycle on this program.

The road, however, has not been smooth. When the Ministry of Agriculture asked us, a few years ago, to create a program for upgrading the skills of their field extension professionals, our immediate reaction was that they should join the regular 4-year program that we already had in place. We even had provision to admit candidates from the field with advanced standing. The Ministry of Agriculture and the regional bureaus of

Belay Kassa is acting president, Alemaya University of Agriculture, Ethiopia.

agriculture responded that they could not afford to release their staff for 4 years: they wanted a tailor-made program that would take less time. All sorts of doubts and questions went through our minds. We even wondered what we would call such a program. In our minds, it was not possible to obtain a degree in less than 4 years. It had never been done before. It was just not possible.

Eventually, we learned of a similar program at the University of Cape Coast in Ghana—and we were interested to know more about it. After extensive consultations with Sasakawa Africa Association and Winrock International, and visits to the University of Cape Coast, we decided to give it a try. We designed a program that took into account the diploma training and field experience the candidates already had. The program was launched at the beginning of 1997.

Although it is too early to assess the success of the program, our experience with the first group has been encouraging. It has helped to de-mystify some of the concerns that we had. For example, we had doubts about the ability of these candidates to follow an academic program, given the many years that they have been away from an academic environment. But the results of the first group speak volumes about their abilities: 4 of the 28 students who are going to graduate on Saturday passed with distinction.

As you will hear from my colleagues from Alemaya, the challenges are by no means over. Chief among them is the demand on staff time. Once you start, there is no free time. It is like a conveyor belt—continuously in motion. For example, July to September normally is our vacation period. Staff can afford to take time off and visit their families in different parts of the country. However, with this program, these months actually are a peak activity period. Right now, one group of students is embarking on extension projects around the campus, which they will be working on throughout the "vacation" period. They will require staff to guide them. Another group has been in the field since February, working on their 8-month-long extension projects. Staff will visit each of the students to offer on-the-spot instruction. In addition, we are in the middle of recruiting for the fourth intake of students. Our staff will have to travel to different regions to administer entrance examinations during the vacation period. So, there is no vacation to talk about as far as this program is concerned. The program is stressful in terms of staff time.

In addition, the program calls for a strong staff development strategy. Continual upgrading of staff is necessary to help them deal with emerging issues relating to the extension expertise of the students, which have implications for the course offerings.

The success we have registered so far encourages us to carry on with the innovative program. We firmly believe this is the way to go if we are to revolutionize agriculture in Ethiopia.

Keynote Address

Roles and Challenges of Agricultural Extension in Africa

Joseph Opio-Odongo

The extension fraternity in sub-Saharan Africa is entering the 21st century with a serious credibility problem. The extension services have been blamed for failing to transfer technologies developed by agricultural research institutes. In addition, reports from a majority of these countries generally point to farmers' lack of confidence in extension workers. Crucially, extension workers' inability to practice what they preach puts them in bad light as change agents.

The insensitivity of training provided by institutions of higher learning to the future work environment of extension workers and to the circumstances facing farmers contributes to the credibility problem. Although other factors certainly contribute to the slow uptake of modern technologies and the failures by countries of sub-Saharan Africa to realize a green revolution,[1] the credibility problem must be addressed if the extension service and the extension profession in sub-Saharan Africa are to remain relevant and competitive.[2]

The credibility problem is exacerbated by a variety of changes that countries of sub-Saharan Africa have been experiencing since the early 1980s. Macroeconomic reforms have robbed the traditional extension services of some important incentives that they depended upon to attract farmers to participate in extension programs. The removal of subsidies for agricultural inputs is an example.[3] Yet when the private sector fails to efficiently make agricultural inputs available, or when input prices suddenly rise in response to a falling currency exchange rate, farmers tend to blame the extension service for their woes. This is largely due to farmers' ignorance of the changed circumstance brought about by the macroeconomic reforms.

[1] Such as the appropriateness of technology, the profitability of the technology in question, the input supply system, and the availability of improved seeds.

[2] In Uganda, the extension credibility problem compelled the national agricultural research organization to take a lead role in technology transfer, yet nearly all its staff lack professional competence in extension.

[3] Most countries of sub-Saharan Africa have structural adjustment programs and have had to drastically reduce or eliminate subsidy-based incentives, some of which the agricultural extension services once depended upon to attract farmers to extension programs.

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Also, the down-sizing of the public sector and decentralization policies have complicated the search for solutions to the credibility problem. The down-sizing of the public service has weakened the professional strength of the extension service at the center, reducing its ability to backstop the extension services at the subnational level. The devolution of power to subnational units to manage the extension service under the decentralization policy, no doubt, is beneficial. Many such units, however, lack human and financial resources to ensure the vibrancy of the extension service. Until these resource constraints are resolved, more innovative extension delivery mechanisms are needed; otherwise the extension credibility problem may worsen.

With decentralization and privatization policies in effect and with a smaller public service, the public sector can no longer be the sole provider of agricultural extension. The down-sized (rationalized) public-sector extension service could benefit from partnerships with private firms and voluntary agencies involved in delivering agricultural extension services. This has implications for the work method of field extension workers, requiring them to be skillful in, among other things, partnership building, negotiations, and conflict management.

At the epistemological level, the capability of participatory development methods to engender farmer empowerment is a challenge to traditional extension methodologies that are premised on a unidirectional flow of knowledge from the modern to the traditional systems of agriculture. Conventional extension methods have tended to treat farmers merely as objects of technology transfer. The participatory approach, however, demands that farmers be treated as both subjects and objects of technology generation and dissemination.

Additionally, there is a growing recognition of the need for coupling modern scientific knowledge with indigenous technical knowledge to enhance technology generation and dissemination. Wider use of participatory methods and the accepted relevance and value of indigenous technical knowledge therefore suggests that farmers be treated as bona fide sources of substantive information in promoting agrarian change. Agricultural research scientists and extension workers should no longer shun the sharing of information and knowledge between the modern and traditional systems of agriculture. Teaching and research methods in the field of extension have to respond to this epistemological shift.

The epistemological shift also demands that extension workers, as change agents, must carefully assess the technical merits of the indigenous technical knowledge associated with, for instance, cropping and planting strategies, soil and water conservation, seed selection and preservation, and agricultural biodiversity. Trainee extension workers should therefore acquire skills in accessing, interpreting, and using indigenous technical knowledge. This is a challenge for agricultural colleges and universities.

At the strategic level, by focusing more on the contents of extension messages and less on the contexts in which such messages become useful to farmers in managing change, extension services in sub-Saharan Africa have compromised their impact on farmers' livelihoods. By remaining insensitive to the dynamics of macroeconomic, political, and agrarian changes taking place, they have helplessly watched farmers succumb to the adverse impact of such changes.

Instead of serving as strategic support organizations capable of understanding

the contexts within which farmers operate, thereby helping them to manage change, the extension services have tended to pursue technology transfer as an end in itself. Inevitably, extension strategies and advice have lacked tact and impact. There may therefore be a need for agricultural colleges and universities to examine the extent to which their curricula are able to respond to such dynamics as a means of building the skills of extension workers in helping farmers to manage change.

SAFE as a Strategic Response to the Credibility Problem

Partly as a response to the credibility problem, the Sasakawa Africa Fund for Extension Education (SAFE), in collaboration with Winrock International Institute for Agricultural Development, is engaged in helping selected African universities and colleges to reform their extension curricula to make them responsive to the training needs of mid-career extension staff. The universities involved are University of Cape Coast in Ghana, Alemaya University of Agriculture in Ethiopia, Makerere University in Uganda, and Sokoine University of Agriculture in Tanzania.

Several issues are pertinent in examining the likely impact of the SAFE initiative on the credibility problem: first, the changes in the human condition and the agrarian situation to which extension must respond in helping to improve farmers' livelihoods; second, the set of myths that has minimized the effectiveness of the extension service; and third, anchoring of innovative curricula revision on the challenges and opportunities that exist, building on the desirable partnerships between extension, research, and farming.

The Human Condition and the Agrarian Situation in SAFE Countries

Table 1 presents measures of the human condition in the SAFE countries in the mid-1990s. While Ghana and Uganda enjoyed higher incomes (GDP per capita) than did Tanzania and Ethiopia, those incomes were not associated with better access to safe water, health services, or sanitation. Tanzania's rating on poverty is striking considering its GDP per capita in comparison with that of its SAFE counterparts.

Some political and policy decisions seem to have been responsible for the

TABLE 1

Human development situation in the SAFE participating countries, 1995.

Indicators	Ethiopia	Ghana	Tanzania	Uganda
Life expectancy at birth (years)	49	57	51	40
Adult literacy rate (%)	36	64	68	62
Adjusted real GDP per capita (PPP$)	455	2,032	636	1,483
Human Development Index	0.25	0.47	0.36	0.34
Population below national poverty line (%)[a]	–	31	50	55
Human Poverty Index (%)	56	32	40	42
People not expected to survive to age 40 (% of total population)	34	23	31	44
Population with access to safe water (%)[b]	75	35	62	54
Population with access to health services (%)[c]	54	40	58	51
Population with access to sanitation (%)[b]	81	45	14	43
Underweight children under age 5 (%)[d]	48	27	27	26
Children not reaching grade 5 (%)	49	–	17	–

a/ 1989–94. b/ 1990–96. c/ 1990–95. d/ 1990–97.

Source: UNDP 1998.

differential performance, as reflected in the overall favorable Human Development Index values relative to GDP per capita for both Ethiopia and Tanzania. Such political and policy contexts determine the success of extension as a tool for improving the livelihoods of farm families—more so if it is recognized that factors such as basic health services, functional literacy, credit, tenure, marketing, and infrastructure (especially feeder roads) directly or indirectly affect the success of the extension service.

Policies that adversely affect some or all of these livelihood factors also are likely to impact negatively on the performance of the agricultural extension service. It would therefore be advantageous if the skill mix of the mid-career extension workers included the ability to understand and monitor the likely effects of policy shifts on farmers. Also, in the wake of rapidly changing national and global circumstances, the extension service should place a premium on information necessary to manage change. Training in accessing the internet to gain information from agricultural and other related web sites would be useful in this regard.

Table 2 provides further information useful in considering the reorientation of extension training in the SAFE countries. Of the four, Ghana shows the lowest proportion of rural population. In the others, the rural population remains above 70 percent. It took until 1977 for the rural population drop below 90 percent in Ethiopia and until the mid-1980s in Uganda. The share of the rural population in Tanzania fell below 90 percent in 1975 and below 80 percent by 1989.

Although a declining proportion of rural population may imply a concomitant easing of population pressure on land, it does not necessarily also mean better prospects for agricultural productivity.

TABLE 2

The rural economy of the SAFE countries, 1967-97.

Year	Ethiopia	Ghana	Tanzania	Uganda
		Rural population (%)		
1967	92	73	94	93
1972	91	71	92	92
1977	90	70	88	92
1982	89	68	84	91
1987	87	67	81	90
1992	86	65	78	88
1997	84	63	74	87
		Agricultural population (%)		
1967	92	61	90	90
1972	91	60	88	89
1977	90	61	85	87
1982	88	60	84	86
1987	87	59	83	84
1992	85	58	82	83
1997	84	57	80	80
		Agricultural economic activities (%)		
1967	43	29	49	49
1972	42	28	47	47
1977	41	29	46	46
1982	40	29	44	45
1987	39	28	44	44
1992	38	28	43	42
1997	36	27	42	40

Source: FAO 1998.

Crucially, the nature of the incentive structure, which does not favor agricultural occupations, may deter agricultural professionals from becoming farmers. The incentive structure may also discourage the younger generation from making agriculture their main occupation. With an aging farming population, there could be stagnation in production and productivity. However, if policy and tax reforms make returns on investments in agriculture more attractive, commercial farmers may take advantage of the situation to increase production and productivity.

In addition, in Uganda, there is clear evidence that more students with nonfarm backgrounds are opting for agriculture (Opio-Odongo 1993). If the trend is similar in other SAFE countries, it has implications for the training of extension workers. Universities must reconsider the methods

used to induct new students into the extension profession. It is no longer safe to assume that they have a farm background.[4] Methods used in inducting new students should carefully expose them to the realities of local agriculture for which they will serve as change agents. It also requires that field training be designed in ways that enable students to appreciate the epistemological realities of traditional agriculture and the challenges they pose in their subsequent application of scientific knowledge acquired from the degree course.

Ghana, with its low percentage of economic activities based on agriculture, stands in sharp contrast to the other three SAFE countries. Ethiopia, Tanzania, and Uganda are similar on this score, although Ethiopia exhibits a slightly faster decline. The extent of economic differentiation in the four countries partly accounts for this and has strategic implications for extension's role in enhancing economic and social development.

Besides understanding the incentive structures associated with structural transformation of the economy in their country, students should grasp the new roles that the private sector is playing and the likely prospects for private-sector participation in extension delivery and financing. Similarly, changing gender roles attendant to the transformation of the rural economy has implications for the quality and magnitude of extension backstopping. These changes have to be factored into extension training and delivery strategies.

Dealing with Basic Myths

Some basic myths have affected extension training and delivery in sub-Saharan Africa; they are part of the professional legacy. Extension began in Britain in the 1840s when universities extended their work to surrounding communities. This activity was called "university extension." The extension profession and practice spread to the USA, under the land-grant college system, becoming the Cooperative Extension Service to advise farmers on how best to adapt to the vagaries facing the agrarian economy following the industrial revolution. A feature of both the British and American models was the desire to influence farmers to do things differently in order to induce positive change. The strategy to influence farmers has, over the years, taken various forms and labels.

Among the British, Germans, and perhaps Americans, extension is called advisory work—extension agents as experts give farmers advice on the best way to reach their goals.[5] The Dutch call it *voorlichting*, meaning, "lighting the pathway ahead to help people find their way." The Austrians speak of "furthering" or stimulating farmers to go in a desirable direction. This is the equivalent of the Korean concept of rural guidance. The French call it *vulgarisation*, stressing the need to simplify the message for the ordinary farmer. It is *capacitacion* for the Spanish, emphasizing the intent to improve people's abilities through training.

Practically, every country applies a mixture of all these processes. The mixture selected is usually determined by the tradition of the institution in charge of extension rather than by considerations of what is the most appropriate for any given country. Nonetheless, at the generic level, it is believed that extension is about deliberate communication of information

[4] Indeed even those with farm background may have little experience with the realities of local agriculture, given the tendency to see education as a means of emancipating oneself from the drudgery of cultivating the land.

[5] In the field of health, the Germans use the term "enlightenment" to highlight the importance of learning the values underlying good health and to stress the point that we must know clearly where we are going.

to help farmers form sound opinions and make good decisions.

That information is considered useful in many ways, chief among which are (a) analyzing present and expected future situations as they relate to farmers' objective functions, (b) increasing farmers' knowledge, (c) providing specific knowledge related to certain problem solutions, (d) making choices that are optimal to farmers' prevailing situations, (e) motivating farmers to implement decisions made by extension agents, and (f) evaluating and improving upon decision-making skills (Ban and Hawkins 1988). Implicitly, therefore, farmers are perceived as the primary decision-makers except in special circumstances where extension agents make primary decisions.[6]

In practice, however, extension workers in sub-Saharan Africa have tended to behave as if their decisions were mandatory. They have also behaved as if the farmers can only benefit from innovations that are external to their farming systems. And, they have tended to treat farmers as if they were empty vessels to be filled with knowledge and expertise.

The well-known myths that have molded and perpetuated such behavior must be shuttered by training institutions if the SAFE initiative is to contribute to the restoration of the image of the extension profession in sub-Saharan Africa.

The first myth is that a perfect relationship exists between science and technology, and consequently only science-based technologies are worth communicating to farmers. Those who believe this ignore the fact that farmers worldwide continue to depend upon technologies not based on science. They have done so out of conviction rather than conservatism. The technologies have consistently given them dependable, although sometimes suboptimal, results.

It is of course true that science-based technologies can be more efficacious than ones based on indigenous technical knowledge. It is however equally true that some technologies based on indigenous technical knowledge have reached such levels of efficacy that modern science would do little to perfect them.[7] In addition, research on intercropping and agroforestry has confirmed the merits of some technologies based on indigenous technical knowledge. To continue socializing trainee extension workers into ignoring or debunking technologies based on indigenous technical knowledge borders on moral failure by the institutions that train them.

The second myth, which follows from the first, is that agricultural research institutes are the sole source of technological innovations for farmers. Yet strong international evidence indicates that agricultural research institutes are one among the many sources of technological innovations that farmers depend upon (Biggs 1989; Chambers, Pacey, and Thrupp 1989; and Farrington and Biggs 1990). This second myth reinforces the first one, encouraging the trainee extension workers to perceive indigenous technical knowledge as backward. It also does not expose them to alternative sources within the NGOs or private sector. This myth of course is shrouded in the theory of the diffusion of innovation, which simplifies the role of the farmer in the diffusion process to that of an opinion leader, an evaluator, and an adopter of modern technology developed by the agricultural research institutes. The theory does not explicitly recognize the farmer as an innovator in his or her own right.

The third myth is about the robustness of the technologies developed by agricultural research scientists, so that their adaptation by farmers is construed as a

deviant act by research scientists and extension workers. Yet international evidence informs us that farmers worldwide always adapt whatever technologies they are interested in to fit their ecological, economic, social, and financial circumstances. Evidence from an aquaculture program in Bangladesh is the most telling. After farmers were taught the stocking rates, species composition, and feeding regimes, they adhered to the extension instructions only during the first cycle of the project. Thereafter, almost "every cage culture practice promoted at the start of the program was subsequently changed by the participants with remarkable speed" (Kamp 1996). They built on their experience with the behavior of the fish, the consumers, and the market to change the fish species mix, the stocking density, feed regime, and harvesting strategies.

Much as the trial stage of the adoption process anticipates this type of farmer behavior, diffusion theory however presents innovations as finished products from agricultural research. The extension trainees therefore may never be taught that the "new" technologies that they will be helping farmers to implement could easily be modified versions of the original prototypes from the research institutes. Similarly, they may not be provided with the skills to verify the logic behind technology adaptation by talking to farmers. Yet if they did so, it would provide them with additional information to fulfill their liaison function with research more competently. The upshot is that trainee extension workers may graduate without having an appreciation of the strategic role of farmers as co-designers of technological innovations.

Crucially, the logic and reasons behind farmers' adaptation of technologies provides a wealth of information for both the extension agents and the research scientists. Rather than snobbishly behaving as expert advisors and instructors, extension agents should instead humble themselves occasionally by switching roles in order to learn and receive advice from farmers. For this to happen, trainee extension workers must be adequately prepared, especially with skills for careful observation of farmer behavior, for attentive listening to the farmer's side of the story, and for constructive dialogue with farmers in verifying the logic behind technology adaptation.

The fourth myth is that good extension workers are those who excel in communicating technical instructions to farmers on how to apply technologies developed by the agricultural research institutes. In their training therefore, extension workers are frequently reminded of their liaison function between research and farming—a function they must diligently perform in enabling farmers to make the transition from awareness and trial to adoption, ultimately, of technologies that are being promoted. Their minds may therefore never be opened to the fact that farmers are not passive objects ready to imbibe whatever information comes from outside.

The fact that during the trial stage, farmers tend to adapt the innovation to their circumstances means that the extension workers should do more than just behaving as sales persons. Extension workers must help farmers learn the basic concepts underlying any given practice or innovation that they will adapt to their farming situations. It is therefore worthwhile for universities involved in the

[6] Such circumstances may include the outbreak of new diseases or of an epidemic. In situations where farmers are faced with legislative fiat, they too may capitulate to the whims of the extension agent even if they are not convinced that his decision is beneficial.

[7] In 1930, Worthington discovered that some of the tribal technologies used by natives in the Bauchi Plateau in Nigeria for soil conservation could hardly be perfected by science.

SAFE initiative to examine the extent to which current curricula allow for this type of skill building.

The fifth myth is that educated people, such as extension workers, are the ones best placed to teach farmers. This myth is supported by the belief that illiteracy negatively affects the adoption process. The root of this myth is the tendency to pit the expertise of educated people against the experience of uneducated farmers. Farmers therefore are treated as mere learners who must be on the receiving end of knowledge creation. In reality, however, among farmers there are innovators who devise solutions to problems facing them. Such farmers serve as bare-foot researchers and extension workers in their communities, creating and diffusing new technologies. They also are capable of teaching both fellow farmers and extension workers.[8]

Again the example from the aquaculture program in Bangladesh is instructive. "It did not take long . . . for women [participating in the program] to begin learning at a faster rate than the extension workers. They soon knew more about cage culture than the staff themselves, despite the fact that [extension workers] had considerable expertise in aquaculture and the women involved previously had none" (Kamp 1996)

Similarly, in an integrated pest management (IPM) project in Indonesia, no sooner did the agricultural graduates employed by the project begin to perform badly than the farmer field schools decided that training staff in the project must all be farmers. Candidates were selected from among interested farmers who were IPM field school alumni or those who were endorsed by fellow farmers. This shift had to be made because the graduates were found lacking in practical know-how, yet farmers had a wealth of experience in managing crops. The implication of these two cases is that trainee extension workers should be taught to respect farmers' expertise and to be willing to learn from farmers.

Anchoring Curricula Review on Challenges and Opportunities

Various challenges arising from the changed circumstances in the SAFE countries and the need to deal with some of the basic myths that have undermined the effectiveness of agricultural extension form the basis for seeking more innovative extension training programs for mid-career extension workers. These challenges are examined below in the context of the partnership between research, extension, and farming to identify the basic skills that trainee extension workers must acquire to become more effective as change agents.

Farmers are the primary decision-makers and movers of change. Extension workers therefore have to facilitate the change process. As change agents, extension workers can play four crucial roles: (a) facilitating farmer self-development through empowerment, thereby building their skills to manage change, (b) facilitating an understanding of new opportunities that exist in the local and regional market, (c) working with farmers and researchers to test the usefulness of technological innovations developed by both researchers and farmers, and (d) serving as an agribusiness consultant to help farmers, individually or collectively, improve their businesses and capture new opportunities created by changed circumstances.

To play these roles effectively, extension workers must have adequate knowledge and understanding of the prevailing and likely situation facing farmers; they must have the necessary skills to perform

each of the four roles successfully; and they must cultivate the habits of listening more than talking, learning more than teaching, and facilitating more than leading.

Traditional training programs, however, do not seem to adequately prepare the extension workers for these roles. There are a variety of reasons (Burkey 1993), chief among which are

- excessive focus on technical agriculture, with little exposure to the important human and organizational side of agriculture
- unnecessary distinction between those who give and those who receive knowledge, so that trainees rarely participate in planning and running training programs
- dissemination of knowledge predominantly by the lecture method, which does not augur well for experiential learning
- neglect of training in social skills concerned with communicating and working with people; if done at all it is at the theoretical rather than practical level
- avoidance of the vital questions of social, economic, and political structures of the country, which affect both extension delivery and the ability of farmers to adopt new innovations
- a tendency to organize training programs away from real-life situations facing farmers, making it difficult for trainees to relate what is being done to actual farm conditions

To deal with some of these drawbacks in training programs, an innovative approach to technology development and delivery is hereby proposed. Figure 1 depicts the interface between farming, research, and extension. Four main thematic issues emerge for consideration

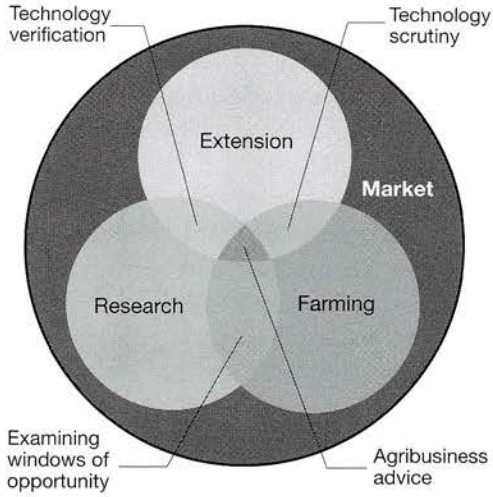

Figure 1. An innovative approach to agricultural technology development and delivery.

and examination of the kinds of skills required of the extension worker.

1. *Examining windows of opportunity* is about providing trainee extension workers with the skills to understand and appraise the farming systems within which they will operate after graduation. The social, economic, and political forces that determine the nature of opportunities for farmer development and the ultimate farmer adoption behavior should be understood by trainee extension workers. Furthermore, they should be knowledgeable about the effect ongoing policy and institutional reforms, as well as general economic transformation, have on the prospects for, and the pace of, farmer development. Since the world is becoming a global economy, trainee extension workers should have a sound appreciation of how the dynamics of the country's productive forces and the process of

[8] Promoting Farmer Innovations, a regional project in East Africa sponsored by UNDP/UNSO, is yielding interesting results on farmer innovations in soil and water management practices in Kenya, Tanzania, and Uganda. The participating farmers have attracted much attention from fellow farmers, extension workers, and researchers. Their farms have turned into farm field schools. Through farmer exchange visits within and between countries, technologies developed by the farmer innovators are being rapidly adopted.

globalization affect farmer development.

Given the farmers' predominant use of technologies based on indigenous technical knowledge, trainee extension workers must also acquire skills in identifying and verifying such technologies. They should also be able to carefully interpret the main messages coming from agricultural researchers' rediscovery of the merits of some of the traditional farming methods. Training institutions may therefore want to examine how courses in agricultural development and rural sociology can best provide these skills at the theoretical level. The institutions also could benefit from a review of the modalities in place for special project research and field attachment at the community level as tools for practical acquisition of such skills.

2. *Technology verification* is about enabling students to grasp some of the discrepancies between the neat science of modern agriculture and the realities facing local farming communities. Here students would work closely with extension workers and agricultural researchers to verify the merits of prototype technologies. It provides an opportunity for dialogue between students and community members. It demands, however, that the students possess knowledge of the conceptual basis of experimental design and understand economic appraisal of experiments.

Additionally, it requires the student to acquire skills in communication so that their dialogue with farmers can feed effectively into that between them and extension workers and researchers. Courses in research methods including economic analysis of experimental results, communication, and interpretation of research findings would be useful for the students. Special projects or field attachments could be used to meet this need.

3. *Technology scrutiny* takes place at the interface between farming and extension. This theme is about extension workers helping farmers gauge the merits of various technological options available to them in relation to what they are applying. It requires a sound knowledge of the logic used by farmers in technology adaptation. Since farmers choose among various technological options available to them, the extension trainees must have skills in determining how such choices are made.

Students should also learn how technologies are developed by farmers, drawing upon both indigenous technical knowledge and other sources of information. In addition, students should learn from farmers how they convince fellow farmers to adopt innovations. In general, the skills extension trainees need to benefit from the dialogue between them and farmers during technology scrutiny are the art of good listening, effective communication, group dynamics, interviewing techniques, and evaluation techniques. Field attachment offers an excellent opportunity for practical application and sharpening of these skills.

4. *Agribusiness development* represents the interface between farming, extension, and research. This theme is about understanding the future role of extension trainees as business consultants to the farmers. In this context they need to know how farmers make decisions in light of prevailing market and other conditions. Farmers' sources of information in making decisions should be known. The trainee extension workers should also be able to appraise the ability of farmers to read the market and capture new opportunities. Trainees should acquire skills in organizational development as a tool for enabling farmers to use collective actions in dealing with problems they face. Similarly, trainees should understand the benefits and challenges of partnerships between the

government extension service, NGOs, and the private sector in supporting farmers.

Broadly, the skills that trainee extension workers need in preparing themselves as future agribusiness development consultants include SWOT analysis, gross margin analysis, market analysis, communication, formation and management of farmer organizations, negotiation, and conflict management. Much as courses in agricultural economics, farm management, and rural sociology may provide some of these skills in theory, farm management case studies and field attachment offer opportunities for sharpening students' practical skills.

Conclusions

There is clear evidence that changing circumstances within SAFE countries affect the delivery of extension services. They also demand that extension workers gain additional skills to serve effectively as change agents.

While some specific proposals are made here on the way forward, two basic issues need further consideration. First, how best to deal with the skill-building demands through both pre-service and in-service training must be explored. In-service training could be organized to sharpen the skills of mid-career extension workers so that they can respond to the specific demands of the work situation. Such courses could also introduce extension workers to new methodologies that are useful to their work. Pre-service training could be limited to providing the basic skills that all extension workers should have, building on courses that exist within the faculty or university of agriculture.

The second issue is how to deal with skill building in participatory development methods. Skills in the application of these methods need to be acquired during pre-service training so extension trainees can use them effectively during field attachment and when conducting their special projects. In this respect, trainee extension workers should be helped in learning about the relevance, usefulness, and difficulties of using participatory methods.

Some of the proposals made here have serious financial implications, of course. One goal of this workshop is to come up with innovative resource mobilization strategies to tap resources from donors as well from NGOs and the private sectors.

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Constraints and Potentials of Training Mid-Career Extension Professionals in Africa

William I. Lindley

In discussing the potentials and constraints associated with the education and training of mid-career extension professionals, it is easier to identify the problems than to bring about needed changes. The leadership potential that lies within the pool of experienced extension field staff is largely untapped. In many countries, experienced men and women who lack an academic degree have had little opportunity to participate in the development of national extension policy and strategy. Extension professionals who have a degree are eligible to follow career paths that can lead to management and policy-making positions. Perhaps the greatest potential of a mid-career degree program is the leadership that experienced individuals can bring to extension program and planning in sub-Saharan Africa.

The constraints are many, but the single most difficult problem to overcome in mid-career training is to persuade the university community to accept that academic credit should be granted for previously completed diploma-level study and for successful work experience as an extension professional. If a minimum of 2 years credit can be given for a combination of diploma study and work experience, then the real issue is to build a bona-fide abbreviated (e.g., 18- or 24-month) curriculum that will meet university graduation requirements and address the needs of mature students. With help from the Sasakawa Africa Association and Winrock International, this has been done in Ghana at the University of Cape Coast and is being done in Ethiopia at Alemaya University of Agriculture. The challenge, now, is to adapt the model for use in other countries.

There is also a more comprehensive concern. Agricultural and extension educators have the responsibility to get donors, technical assistance agencies, and national planners to consider the improvement of extension work and the pre-service (pre-employment) education of extension workers as integral parts of the same issue. Millions of dollars are being spent on extension projects that address extension policy, strategy, and in-service training. Almost no attention is being paid

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to the pre-service education of field-level extension staff. In general, support for tertiary education in agriculture is at an all-time low. There are a few signs that this may be changing, but for now higher education in agriculture in Africa is a victim of budget cuts and of benign neglect by most donor organizations and technical assistance agencies.

Some Extension Concerns

A recent informal discussion by FAO extension, education, and communication specialists on extension in Africa identified a variety of concerns, but four major ones stood out. Extension organizations were said to be (1) financially troubled and (2) intellectually adrift. Many were thought to be (3) out of touch with the farmer. It was also said that (4) institutional options were not well defined.

The question of how to strengthen extension organizations in ways that would lead to more efficient and sustainable agricultural production and rural development was not answered to any degree of satisfaction. Participatory extension, farmer field schools, decentralization, privatization, pluralism, and the T&V system were all discussed as variations on the theme. The institutional options were not well articulated, and the best ways to use limited resources (human and financial) were not clear. Extension policy and strategy is still, after all these years, subject to debate.

What was clear in the discussion was that pre-service (pre-employment) and in-service education will continue to play important roles in the revitalization of extension in Africa. Traditionally, upward mobility for talented mid-career extension staff who have an intermediate level of education (i.e., diploma) has been limited by the need for a degree. Innovative approaches for earning a degree have been slow in coming, and there has been resistance to the concept of applying work experience and diploma training toward the requirements for a B.Sc. degree. That resistance is being overcome through innovation and determination.

With financial support from the Sasakawa Africa Association and technical assistance from Winrock International, the degree program for mid-career extension professionals developed at University of Cape Coast and the adaptation of that model in other institutions have opened the door for extension staff to move up through the ranks. Such programs call for academic flexibility and a high level of cooperation between academia and the ministry of agriculture. It is a model that paves the way for leadership based on the combination of experience and a practical approach to a well-balanced curriculum. The leadership potential that lies within this pool of mid-career professionals is a largely untapped human resource that can strengthen extension work in the future. Program leaders and policy makers with field experience should make a difference in the way extension work is done. The question is, how do we combine forces? What is the best way to build on these experiences and organizational comparative advantages to bring about improved and cost-effective extension work in sub-Saharan Africa?

What Does Extension Mean?

Before discussing the constraints and potentials of educational programs for mid-career extension staff, we need to agree on the goals of such a program. If the overall goal is to make extension work more efficient and effective, then at the least, we must agree on what extension is supposed to do. Does your definition of extension work include farmer-to-farmer relationships? Is it an appropriate word

for a system that promotes a collaborative relationship between farmers and the research community? Does it have the connotation of helping farmers to become good decision makers? Is extension an accepted and well-understood term that should not be changed? Or does the word characterize a top-down concept that is no longer appropriate in the context of global knowledge and information systems that span the world? It can be argued that the word extension is still appropriate if we think carefully about who is extending what to whom. However, it is clear that information is no longer just "extended" to the farmer. If the focus is on men and women who are managers and decision makers—farmers who are in touch with each other and in partnership with the research community—then the concept of "extending" information to agricultural producers needs to be revisited and revised. Extension may be a word that we will continue to use for years to come, but surely an agreed-upon working definition is needed as a starting point.

Participatory or top-down, centralized or decentralized, public or private, pluralistic or singular, through the farmer field school approach or not, extension activities play key roles in integrated pest management, agricultural production, processing, marketing, and sustainable rural development. In the education and training of extension field staff, the challenge is to prepare young men and women who have the skills, knowledge, and attitudes and behavior that will help them think through the options of how to work with farmers (young and old, male and female), researchers, and rural communities in a creative and productive way.

The challenge is to develop locally adapted functional models that are alternatives to simply extending advice to the farmer. In figure 1, the extension model is depicted as a system that

- is enhanced by modern technology and good communication skills
- provides unbiased advice
- stimulates and promotes communication among farmers while facilitating and supporting a two-way flow of information between farmers, researchers, and other sources of information

This kind of a service has its own identity, but its raison d'être is to support the farmer.

Figure 1 places extension in a key role in an agricultural and rural knowledge and information system. It is a service that provides unbiased advice. But it also facilitates and promotes a two-way flow of information among farmers and between farmers, the research community, and other sources of information (e.g., banks, markets, NGOs, etc.)

Education and Training for Extension Staff

Degree-level education for extension staff in Africa is still the exception rather than the rule. Many extension staff who have a degree often have never worked directly with farmers at the village level. Usually, degree holders start their careers as middle-level managers. Nearly all front-line extension staff enter the workforce after having completed an intermediate-level equivalent of certificate or diploma-level training in agriculture (i.e., 1, 2, or 3 years of study, depending on the country).

If the content of the curriculum that is available at the intermediate level is examined closely, the resulting image is nearly always one of too little practical training and almost no preparation in the broad area of what is commonly described as extension methods. As a result many front-line extension staff lack the competencies (skills, knowledge, attitude, and

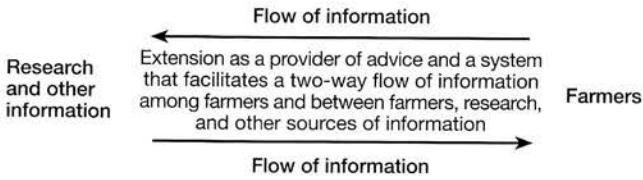

Figure 1. Extension as an advisory service and facilitator in an agricultural and rural knowledge and information system.

resulting behavior) they need to be effective in their work with farmers. A competency-based approach to extension education is rare in Africa. A few studies have been carried out to determine the competencies needed by front-line extension staff, but almost none of the findings have been translated into the development of a competency-based extension curriculum that is in use. The situation is exacerbated by a high incidence of extension students who have no farm background or work experience. Urban students who receive theoretical training in agriculture usually do not make very effective extension workers.

Extension staff are generally involved in two types of education and training. Pre-service education or pre-employment education takes place in the formal setting of an institute, college, or university prior to employment. In-service education is the term broadly used for non-degree training activities that take place while the participants are employed, or "in service."

Pre-Service Education

In Africa, most pre-service education for extension field staff is at the non-degree level, e.g., 2-year certificate or 3-year diploma. These training programs should combine practical training and theoretical study to provide students with the basic skills they need to work with rural men and women in the field. The content of the curriculum for the pre-service education of extension field staff and the amount of "extension methods" to be included in the total educational package is subject to debate. Later in this paper, there is a more detailed look at the concept of a balanced curriculum. What is important at this point is to accept that both extension methods and technical content are needed in the pre-service curriculum. The pre-service curriculum for extension field staff should include extension methodology (with a period of internship in an extension office) along with the technical subjects associated with the production of food and fiber. About one-fourth of the curriculum should be devoted to the study of extension methods such as communication skills, organizing and maintaining groups, program planning and evaluation, and working with special audiences (e.g., male and female farmers, large and small-scale producers, youth) and about three-fourths of the time should be devoted to technical issues related to production of food and fiber, processing, marketing issues, and so forth (fig. 2).

The curriculum should include courses of study that are directly related to preparing extension staff to work with farmers. Consider the curricula in African institutions today. How much time is devoted to the study of extension methodology? Is there a national extension strategy and is it included as a topic in the curriculum? When do students have the opportunity to discuss different extension approaches and how best to work with the men, women, and youth who are often called

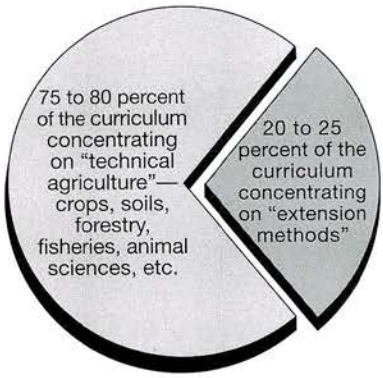

Figure 2. The extension education curriculum: Balance between extension methods and technical subject matter.

extension clientele? Are extension staff and farmers called into the classroom to teach as community resources persons? When do students learn about communication methods? Where should the topics of organizing and working with groups of farmers and more effective work with rural women be dealt with? Do students have the opportunity to work as an intern in an extension office? For teachers, it is generally accepted that student teaching is a good idea. Why then do so few extension training programs have a period of internship when students live in a village and learn more about being an agent of change?

In examining constraints related to educational programs for extension field staff, one major concern is always that the curriculum is too full. The principal of nearly every training institute will say that there is no room for the study of extension methods. They say that all of the time is taken up with the study of more important subjects like crop and livestock production and soil science. However, it is a matter of balance and combining subjects so that there is time for learning how to work with people.

Extension work is not all communication, but an extension worker who cannot communicate will not be a very effective. Rogers and Taylor (1999) stress the importance of involving multiple stakeholders in the development of a curriculum. If we listen to farmers, employers, students, and teachers, it is clear that extension methods should be a part of the curriculum. If 20 to 25 percent of the curriculum is devoted to extension methods, there is still ample time to concentrate on technical agriculture, etc. Tradition can be a major constraint when it comes time for curriculum review and revision. It takes dedication, hard work, and often some outside influence to bring about curriculum change in most academic institutions.

In many cases, endless rounds of in-service training are offered to make up for what should have been learned in pre-service or pre-employment education. Every project and nearly every ministry of agriculture offers in-service training in the hope that extension staff will somehow learn to be more effective based on brief periods of instruction offered by the ministry's training unit.

The point is that extension methods should be an integral part of the pre-service curriculum for the education of extension field staff. Too often there is the argument that there is no space in the curriculum for extension methodology. Nonsense! Priorities need to be set, curricula revised, courses combined, and provisions made for a balance that includes both extension methodology and technical subject matter in the pre-service curriculum.

In-Service Education

In-service education should be an organized program that provides extension field staff with opportunities for learning about new ideas, advances in technology, and best practices. It should be a time to bring staff members up-to-date and to

introduce new extension concepts, environmental and conservation issues, improved production patterns, modern cultural and pest management practices, and market options. The potential of good in-service training is vast if it is well planned as a supplement to pre-service education that has correctly done its job. The problem in many places is that in-service education is being used to make up for what should have been learned at the pre-service level. In so doing, the time available to learn about new things is reduced and the value of in-service training is diminished. A prime example is when precious in-service training time is used to learn about extension methods that should have been included in pre-service curricula.

In-service training, as implemented in many donor-funded projects, has become a mechanism to treat the symptoms instead of the problem. Nearly every donor-funded project with an extension component has in-service training as a major activity. Extension field staff are subjected to weeks of in-service training. The emphasis is often on extension methodology and in making up for what extension workers should have learned as a part of their pre-service education. In so doing, we are only dealing with the surface blemish and not the root problem.

For 40 years, critics have been saying that extension field staff are not well trained. They then proceed to offer in-service training to correct the identified deficiencies. In-service training can never get at the root of the problem. The problem lies within the curriculum and the teaching and learning approaches in the institutions where extension field staff get their pre-service or pre-employment education. Extension projects almost never address the formal training programs that are offered in the institutions where extension workers receive their pre-service education. It is difficult to find a single donor-funded extension project that has included the review and revision of pre-service curricula as a part of a comprehensive approach to improving field-level extension work in Africa.

Constraints Related to Reduced Support for Education in Agriculture

In analyzing why education in agriculture receives so little emphasis, several factors emerge. First, in most donor and technical assistance organizations, the post of "agricultural education officer" does not exist. For example, at Unesco and the International Labor Organisation, the individuals who held the title of agricultural education officer retired within the past 10 years. The post descriptions were changed as new people were hired. At the U.S. Agency for International Development, there may be someone with the title of agricultural education officer, but I cannot identify the post. In the World Bank, such a post does not exist. If it did, where would it be—under agriculture, rural development, or education? Donor agencies approved projects of financial support and technical assistance without considering the formal agricultural education needs of the recipient country. The oversight is not intentional. Rather it stems from a lack of expertise and from review processes that fail to examine the problems from an agricultural education point of view.

Second, there is a lack of communication, cooperation, and collaboration between education and agriculture ministries and similar units in government, donor organizations, and technical assistance agencies. Better education is an identifiable need, and agriculture is recognized as important, but the com-

bined concept of tertiary education in agriculture seems not to have a visible home or advocate. The recognized responsibilities of separate ministries and departments of agriculture, education, and research and the difficulties they often have in collaborating complicate the work to be done in agricultural education.

Third, project proposals seldom identify the need to strengthen colleges and faculties of agriculture. Twenty to thirty years ago there was an emphasis, perhaps an overemphasis in Africa, on increasing the number of tertiary institutions where agriculture was a major subject. The emphasis was on expansion. Bricks and mortar projects were supported to the point that too many agricultural graduates may have been produced. That was decades ago. What is needed now is an emphasis on quality of education and the production of a limited number of students who can meet the employment needs of both the public and private sector.

Fourth, there is a lack of needs assessment. There should be country-by-country assessments of the need for trained agriculturists, as well as companion studies that focus on the capacity of educational institutions to meet the identified needs. A recent study in Tanzania shows that there are training institutions operating at 10 percent of their capacity (Gooday 1999). Students find no reason to enroll in courses that prepare them for a job market in which the prospects for employment are slight. It is a problem that is now beginning to be recognized after a prolonged period of neglect. Donors are re-examining whether it pays to invest in tertiary education in agriculture, and studies are being initiated to determine the level of return on such an investment.

Tertiary-Level Education in Africa

Today in Africa, tertiary 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. FAO directories of educational institutions in Africa where agriculture is taught as a major subject show that enrollment of women in intermediate and higher level agricultural education has increased from 14 percent to 25 percent of total student body during the past 10 years. However, many problems remain. Tertiary-level diplomates and graduates are no longer being automatically hired by governments, and employers in the private sector are demanding higher standards and better-educated students.

There is greater access to tertiary (intermediate and higher level) education, and new courses are being offered in some countries. However, the quality of those offerings 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 intellectual elite. It is good for the North, but it further exacerbates the brain drain and brings

into question the relevancy of the post-graduate degrees being offered. Investment in higher education in the region and the development of North/South university partnerships is one way to address the problem. Without increased incentives, the quality of education will continue to decline.

The *1995 World Education Report* (Unesco 1997) shows that enrollment in higher education (tertiary level) varies greatly in Africa. In francophone countries, enrolments range from 986 per 100,000 inhabitants in Morocco to 50 per 100,000 in Rwanda. In anglophone countries, the range is from 21 per 100,000 inhabitants in Tanzania to 1,636 per 100,000 in Egypt. Average enrollment rates for women have improved in the last 10 years, but they are still 10 to 20 percent lower than the rates for men. Not surprisingly, economic development is clearly correlated with the number of students enrolled in higher education. In a number of countries, including much of sub-Saharan Africa, low levels of education are accompanied by per capita annual incomes of less than US$500.

Tertiary Education for What?

A major purpose of tertiary 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. They should place a high value on continuing to broaden their knowledge of their own field and the sector in general, and they should be creative and open to new ideas. Perhaps most important, they must be able to deal constructively with the technological, cultural, and social changes that will challenge them throughout their careers. As Rogers and Taylor (1999) point out, to meet this objective, curriculum development must be participatory. It requires thoughtful analysis and input from a variety of stakeholders (e.g., faculty members, students, potential employers, etc.).

A primary goal of the curriculum is to guide instructors and students as they move together through the teaching and learning process and the acquisition of knowledge. Students should be capable of making critical judgements and solving problems in a logical and rational manner, of developing excellent listening skills, and of communicating their thoughts and aspirations in a clear and forceful manner either verbally or in writing (Maxwell and Lindley 1999).

Further, students should be able to appreciate the past, to value traditions, to accept the responsibilities of an educated member of a free society, to respect the values of fellow human beings, and to broaden their knowledge of people who are different from themselves. Of course, they must have a basic understanding of the principles and concepts of mathematics and the natural sciences.

A balance of subject matter areas that could be considered as the overall curricula at the university level is as follows:

Group 1. Arts and humanities, 10%

Group 2. Social and behavioral sciences, 15%

Group 3. Natural sciences and mathematics, 25%

Group 4. Courses pertaining to a selected professional option, 50%

Curricula at the intermediate level may be, by necessity, a bit more technical in nature, but a balance is still necessary if students are to graduate with an understanding of the broad principles of agricultural production and rural development, e.g., the role of women in the agricultural sector, the ramifications of rapid population growth, and the effect of HIV/AIDS on the agricultural sector (Maxwell and Lindley 1999).

A Balanced Approach

The critical issue is a balanced approach. There is the question of what is missing from the curriculum and which courses could be combined or eliminated. Department heads will fight to maintain as many courses as possible in Group 4—that is understood. Similarly, nearly every staff member would support including everything possible in Group 3 because that represents the scientific base for the practical application of knowledge and techniques integral to Group 2 and Group 4 courses. The further we delve into the issue of balance, the more complicated it becomes.

At the university level, what is the appropriate ratio of Group 1 courses as compared with the basic and applied sciences? It is suggested that at least 10 percent of the total course content should fall in Group 1. In some institutions, that may mean adding two or three more courses. What kinds of courses? Possibly technical writing, some history, perhaps a bit of art, music, or drama, perhaps some religion or philosophy. These courses should probably be interspersed in the third and fourth years to provide some variety when most of the learning is about technical subjects.

In Group 2, at least 15 percent and not over 25 percent of the total time should be taken up by these courses. Skills to be acquired from these courses are important to the future of the students, and they should not be downgraded. Examples are courses in basic leadership development skills, interpersonal communication, and principles and techniques of working with women and youth to develop effective leadership in the rural sector.

The natural sciences and mathematics courses (Group 3) ought to constitute a minimum of 25 percent of the course content. Group 4 courses should makeup at least 40 percent, but no more than half of the content of the total program.

How Can Changes Be Made?

The obvious question is how to fit one, two, or three additional courses into an already crowded curriculum. The answer is, cut or combine, or both.

What is to be cut out and who will teach the new courses? The suggestion would be not to cut, but to combine in several areas and reduce the total number of course offerings. In animal science, an example might be to combine some course offerings: (a) range management and pasture science, (b) animal nutrition and advanced animal nutrition, (c) animal breeding and advanced animal breeding. These are just examples of finding space in a busy curriculum. At the intermediate and first-degree level, the goal should be to produce broad-based generalists who are problem solvers, not specialized experts.

Teaching-assignment problems can be addressed by small teams of two or three teaching staff who can rotate the responsibility for the introductory courses. Teaching staff should select one of their own to teach a leadership development series of perhaps three or four courses. Faculty members would know who is best qualified to teach these concepts based on their personal knowledge of the individuals involved.

An undergraduate degree should be a broad-based foundation upon which to build a professional career. In some cases, consideration may be given to working out a common syllabus with a nearby diploma institution so that some beginning courses in a given subject could be shared and team-taught. Mid-career or mature-entry students who have experience and training at the diploma level should be given credit for courses taken

and work experience. The goal for a balance of theory and practice should be about 50:50. Good practicals for a degree program are going to be different from good practicals for a diploma program. Some may be the same, but most are going to be quite different.

In this discussion, a *major* assumption is that the syllabus will be followed, that the hours will be put in, and that quality control will be exerted both in the classroom and in the laboratories and field work.

Teaching staff should work in small inter-disciplinary groups. Areas of specialization are not unconnected—the arms and legs are still attached to the body. There are many ways to meet the goals of curriculum revision and development. Curriculum development is a continuous process, and the principles outlined above have been very useful over the years. It is important to remember that potential employers should play a role in the process. Curriculum development should be a participatory exercise that involves all stakeholders, including teachers, community members, employers (government and the private sector), and students.

A Well-Defined Strategy

There is a need for educational planning and policy that will prepare countries to enter the new millennium with a clearer vision of priorities in agricultural education and human resource development issues. Strategic planning is the first and most important step African universities must take to regain the initiative and shape their future. Professor N. Matos, secretary general of the Association of African Universities, in his address to the plenary session of the World Conference of Higher Education, was on target when he said, "To lead to real revitalization of the institution, the implementation of a strategic plan requires that key higher education and university policy matters be addressed and calls upon the university and government authorities, as well as the donor community, to revise their policies and practices . . ."(Matos 1988).

This paper is not intended to develop action plans for individual countries. That is clearly the responsibility of governments and other relevant authorities within each country.

Over the last 15 years, there has been much talk about strategies, definition of the problems, and ways in which they can be tackled, but intermediate-level and higher education in agriculture have improved little. Matos (1998) goes on to say that while the world's scientific and technical manpower was about 23.4 per thousand, the corresponding figure in Africa is 3.4. Eicher (1999) argues that Africa is muddling through, ill prepared to cope with the awesome task of dealing with short-term food emergencies and the long-term challenge of feeding an extra half billion people over the next 20 to 25 years. Although perhaps not strictly relevant, the issues of political stability and intellectual integrity are also factors that are a part of the educational equation. Gooday (1999), in a West African strategy prepared for FAO, states that the first requirement for development is political stability. He cites political uncertainty as a factor related to indecision and donor fatigue.

Investing in Agricultural Education

In the recent past, considerable attention has been paid to improvement of research and extension activities, while the development of knowledge and skills in agriculture through education has not been adequately addressed. A World Bank database exercise (Willett 1998) identified

13 projects supporting tertiary agricultural education and training[1] during the 1987–97 period, which involved a total World Bank investment of US$156 million. This amount pales in comparison with World Bank support for agricultural research (US$2.5 billion) and agricultural extension (US$2.2 billion) over the same period. By level of agricultural education and training, the bank supported agricultural higher education in six countries (US$108 million[2]), middle-level agricultural education and training in six countries (US$31 million), and agricultural technical and vocational education and training in four countries (US$17 million).

Figure 3 illustrates the imbalance in the World Bank's 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 expenditures on extension and research create triangle that is unstable and difficult to justify. An equilateral triangle formed by equal 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 important but often ignored aspect is the role of agriculture in the economies of African countries. In many other parts of the world, it is accepted that the contribution of the agriculture sector to GDP is rapidly diminishing. This is due to the development of industrial, mining, service, and other sectors. These other sectors may be growing in African countries, but much more slowly than in Asia or Latin America (table 1). Therefore, a strong argument can be made for greater support for agricultural education and human resource development throughout the whole of Africa. Rising population in Africa,

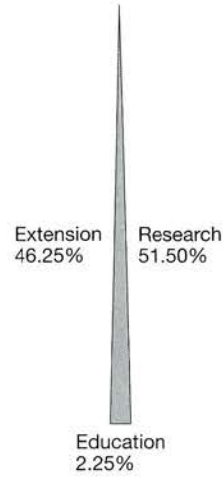

Figure 3. Disproportionate World Bank investments in agricultural extension, research, and education.

together with sluggish growth in agricultural production, gives cause for alarm.

In 1983, food self-sufficiency in Africa was estimated at 83 percent. That compares with 56 percent now. Every possible action for improving the quality of trained human resources for agricultural production, extension, and research services should be explored.

Investing in Education for Development

Over the years it has become fashionable to question the value of investing in education for development. Skeptics observe that despite investments in human resource development through education in Africa, food production per capita has declined and poverty levels have increased. The problems of poverty and food insecurity in Africa are complex, and an improved level of education is but one, although a very important one, among several necessary conditions required to achieve social and economic progress.

Four decades ago, the renowned education economist T. W. Schultz said, "It simply is not possible to have the fruits of

TABLE 1

Agriculture GDP as percentage of total GDP for selected countries, 1980 and 1995.

Countries	1980	1995	Change (%)
Francophone West Africa			
Burkina Faso	33	34	1
Benin	35	34	–1
Cameroon	29	39	10
Central African Rep.	40	44	4
Congo	12	10	–2
Côte d'Ivoire	27	31	4
Mauritania	30	27	–3
Niger	43	39	–4
Senegal	19	20	1
Togo	27	38	11
Asia			
China	30	21	–9
India	38	29	–9
Indonesia	24	17	–7
Malaysia	22	13	–9
Philippines	25	22	–3
Latin America			
Colombia	19	14	–5
El Salvador	38	14	–24
Honduras	24	21	–3
Paraguay	29	24	–5
Uruguay	19	9	–10

Source: FAO.

a modern agriculture and the abundance of modern industry without making a large investment in human beings" (Schultz 1962). This statement is still true. His later studies on the benefits of investment in education at all levels (tertiary, secondary, and primary) found rates of return in Africa ranging from 14 to 27 percent at the social level and 33 to 45 percent at the private or individual level (Schultz 1989).

The improvement of a country's human resource capacity for productivity is a prerequisite for social and economic development. In the agricultural sector, both formal and nonformal education are essential for improving food security, raising the levels of rural employment, and reducing poverty. Formal agricultural education is needed for the production of skilled manpower to serve the agricultural sector as producers and through extension, research, entrepreneurship, and commerce. Nonformal agricultural education, provided by both public and private extension services, is needed for support to farmers, farm families, and workers and for capacity building in a wide range of rural organizations and groups.

Nonformal education can have impressive results. A number of studies have shown that farmers' training has a positive effect on agricultural production. A study on the value of education in small-scale agriculture in Nigeria found that an increase in the average education of a farmer by 1 year raises the value added to agricultural production by 24 percent (Durojaiye and Olanloye 1992). This finding has important implications for improving farmers' productivity through training.

The study also found that formal education and nonformal education through extension can be viable substitutes, indicating that low levels of education among farmers can sometimes be offset by the provision of good extension services. Durojaiye and Olanloye (1992) concluded that "investment in farmers' education or a successful policy of bringing educated persons into agriculture can accelerate agricultural production." Unfortunately, FAO data show that investment in agricultural training, extension, and research has declined from 9 percent of total donor agricultural assistance in 1984 to less than 2 percent in recent years.

Recent FAO and World Bank discussions concerning improvement in the quality of higher education in agriculture have focused on the need for long-term

[1] Defined as comprising agricultural higher education, middle-level agricultural education and training, and agricultural technical and vocational education and training.

[2] Of this total, one project in India accounted for US$74 million.

commitment in order to achieve economic development. However, there is an immediate need to upgrade academic staff, to improve the standards of students through better secondary education, and to strengthen educational policy and institutional management. Post-graduate 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 governments and private employers demand. 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 require better training in both technical agriculture and in the extension methods needed to disseminate production technologies to the thousands of small-scale farmers who want 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 preventing food losses during harvest, storage, marketing, and processing.

In East Africa, at the secondary school level, there are several examples where agriculture, along with other science subjects, is providing the foundation for students who want to study agriculture at the tertiary level. However, in West Africa, the study of agriculture in regular secondary schools is very limited. The issue needs to be addressed as part of national and regional educational policy.

At the elementary level, the study of agriculture is severely limited. Although school gardens have sometimes been promoted, agriculture generally is not taught at the elementary level. Rural students drop out of school at a high rate. In many cases, as many as 90 percent of those who go to elementary school, do not go beyond that level. If these students, many of whom will be farmers, are to study agriculture in a school setting, it will have to be at the elementary level. The farming population comes from rural youth, and Africa's food security depends on those farmers. If, as mentioned earlier, an additional year of education can increase a farmer's productivity by nearly 25 percent, then consideration should be given to the deployment of resources where they will have the greatest impact.

Population Pressure and Other Constraints Facing Education and Development in Africa

Total population in Africa tripled between 1950 and 2000, and urban population

levels grew even faster. In 1950, the urban-rural population ratio was 1:10; in 1990 it was 1:3.4. In 2010 it is projected to be 1:2. In much of Africa, per capita production and food intake is diminishing. Increasing population density and pressure on the land have altered traditional production patterns and sustained agricultural production is being threatened. In Africa from 1995 to 2010, food importation costs will be more than twice the income from agricultural exports (Gooday 1999).

The school-age population is expected to double between 1990 and 2010. Currently, average primary school enrollment in the region is approximately 40 percent, and that low figure is compounded by a dropout rate of 40 percent. The risk of increasing the current illiteracy rate in sub-Saharan Africa, which is estimated at 52 percent of people aged 15 and above, seems very great indeed.

A recent review (Jallade and Gooday 1988) in six francophone countries of the Sahel (Burkina Faso, Mali, Mauritania, Niger, Senegal, and Chad) found notable differences among the agricultural education systems, but the following problems were common to all:

- high recurrent costs, especially in relation to the number of persons trained
- low internal efficiency rates
- low quality of education
- lack of relevance to national rural development needs
- supply of trained personnel in excess of demand

These problems were found to have diverse causes, ranging from too low student-teacher ratios, exorbitant expenses for non-teacher salaries, high drop-out rates, no-fee and full scholarship policies, inadequate facilities and equipment, and the inability of governments to guarantee, as in the past, immediate employment to graduates.

The report also points out that a regional policy for agricultural education and training and a regional cooperative approach are not only desirable, but possible to achieve. A major constraint, however, is the relatively low level of funding allocated to education in agriculture.

Teaching methods and curricula are not being adjusted to the new requirements and demands for trained manpower in agriculture, especially from the private sector. Government employment of graduates is no longer assured, and structural adjustment is having a negative effect not only traditional employment patterns, but on the ability of educational institutions to respond to training needs. To meet the challenges of agricultural production and food security facing Africa today and in the 21st century, countries must be willing to invest in their human capital for development.

New Expectations and a Challenge for Agricultural Education

What matters most for economic development in Africa is the ability of rural people to be efficient producers given their natural resource base. There is little doubt that economic and social development, and the benefits that accrue, such as improved nutrition and health, require an educated populace. Good educational systems will not solve all problems, but they are a prerequisite for sustained agricultural production and economic development.

I encourage African educators to examine their educational programs at all levels. At the higher levels of education, consider joining forces to create specialized centers of study where the compara-

tive advantages for university and graduate-level study are obvious. Specialized centers for research and graduate study would bring a relevancy to research work that cannot be achieved by sending students abroad. Look for investment possibilities and university partners in the North. Review your intermediate-level training in agriculture and try to bring more relevance and efficiency into the system. The lower levels of education also need to be reviewed with emphases on quality and relevance and on equal opportunity for male and female youth.

FAO stands ready to respond by helping to define national and regional problems, by helping in the estimation of the demand for trained agricultural personnel, by providing technical assistance for agricultural education, and by helping to mobilize the donor community in efforts to apply education to the task of achieving food security. Improved formal and nonformal education in agriculture can make a difference. But in bringing about educational improvement for development, countries will have to redefine their national priorities, the donor community will have to make a commitment, and education systems at all levels will have to undergo a thorough examination. It is a challenge for all of us, and one that we dare not ignore.

The mission of agricultural education in Africa in the 21st century is to work toward improved, relevant, and effective teaching, research, and extension. To achieve food security for all, education in agriculture must prepare a critical mass of dedicated, well-trained men and women who are committed to achieving socio-economic improvement for Africa. Investment in education today cannot be ignored if the benefits of a better world are to become a reality for our children and grandchildren tomorrow.

Harnessing Modern Communication Technology

Distance learning, by definition, places the learner in a location that is removed from the instructor. Traditional approaches to distance learning have included, in various combinations, written materials sent by post, the use of radio and television, telephone conference calls. In some instances, brief periods in residence for discussion and examination have been employed as ways to increase the effectiveness of distance learning.

Research has found that distance learning is enhanced through the motivational impact of an instructor or a discussion leader who brings a live and interactive element to the process. It has been observed that distance-learning programs transmitted by radio to listening and learning groups are strengthened by an informed group leader or instructor who can lead a discussion on the subject matter heard by members of the group. Two-way satellite television connections have added a dynamic, real-time, interactive element to distance learning that has proven to be effective but also expensive, with a demand for high-capacity transmission facilities.

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. In the more industrialized countries, computer-enhanced distance learning is now commonplace. In many less-industrialized countries, the computer is still a bit of a mystery and little used in distance learning.

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 in-service training of 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 availability of 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 front-line extension staff can now be a realistic goal in many countries.

Unfortunately these interactive systems are not found in many developing countries. More specifically, the systems and programs are not available 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. 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 ways to learn should 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.

A recent paper (FAO 1999) recognized the importance of developing and strengthening distance-learning programs. 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.

Investing in Agricultural Education

In the best farm tradition, a three-legged milking stool may be a model for an investment strategy (fig. 4). The three legs form a base that is stable and unshakable even in the most difficult situations. Extension education and training projects supported by the donor community in collaboration with technical assistance organizations and educational institutions bring the strengths of each partner to bear on the problem of preparing and upgrading extension staff.

The University of Cape Coast and Alemaya University of Agriculture have used this model with great success. It is one that could be used in other locations

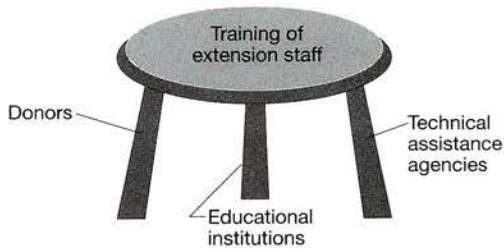

Figure 4. An investment model for education and training.

with other players. Sasakawa African Association, Winrock International, and the universities have adopted this model, and it has worked very well. Its potential can be extended, and it can be used at the national, regional, and multi-country level. From the certificate level to graduate programs, the challenge is to put together a proposal that makes sense and meets your needs. Generally speaking, support can always be found for a good proposal. Prepare a good proposal; it will not go unanswered.

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Case Study of Innovative Agricultural Extension Training

Alemaya University of Agriculture, Ethiopia

Heluf Gebrekidan

To raise Ethiopia's living standards, the government has intensified its commitment to the development of the agricultural sector. "Rural-based economic development" and "agriculture-led industrialization" are the foundation of the country's economic policy. The recent restructuring of the national agricultural research system and its reorganization into the Ethiopian Agricultural Research Organization, together with an expansion in agricultural research programs and a vastly increased annual budget for research and training in the field testify to the government's intention to implement its economic policy by strengthening the country's agriculture.

Another strategy of the government is the adoption of an aggressive national agricultural extension intervention program involving the distribution of large quantities of seed and fertilizer to smallholder farmers on a loan basis. The national agricultural extension program is modeled on the approach of SG 2000, which has been operating in the country since 1993.

Efforts to produce agricultural extension graduates at Alemaya College of Agriculture were begun in the early 1970s, when a B.Sc. degree program in agricultural extension and education was introduced. The program had about 25 graduates before it was terminated in 1978 mainly because its role in the agricultural policy and national efforts of the time was not fully appreciated.

In 1993 to contribute to the current national agricultural goals, Alemaya University of Agriculture (AUA) reintroduced, a 4-year degree program in agricultural extension modeled on the other conventional academic degree programs of the university. AUA also recognized that, in addition to more agricultural extension graduates, the national economy required upgrading the training of extension professionals already in the service. Consequently, AUA launched the Mid-Career B.Sc. Agricultural Extension Program in 1997.

Creating a Mid-Career Extension Program

When the government embarked on the massive national extension intervention program, it became clear that the existing extension staff were not well equipped for

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the new initiative. In 1993, the Ministry of Agriculture had an extension staff of about 8,000, the majority of whom were diploma holders who assumed technical and supervisory positions (Gebre 1995). Providing these cadres with additional training to upgrade their skills was therefore viewed as crucial for the successful implementation of the planned national extension efforts. As a result, AUA was asked to develop a program for upgrading the skills and capacities of mid-career agricultural extension professionals.

AUA had no experience in developing nonconventional training programs tailored to the needs of specific client groups that would at the same time be acceptable to the broader academic community within the university. Faced with this challenge, AUA held extensive consultations with both national and international organizations including the Sasakawa Africa Association (SAA) and Winrock International Institute for Agricultural Development, which were experimenting with similar initiatives in Ghana at the University of Cape Coast.

The consultations led to two national feasibility and needs-assessment studies. The studies were designed to reveal the extent of the demand, the nature of the curriculum that could be developed to meet the demand, how the curriculum to be introduced related to and differed from the curriculum of the classical type of B.Sc. degree program in agricultural extension run by AUA, and how questions about accreditation, reputability, and sustainability of the program could be resolved. The results of the studies were then discussed at two national workshops in which the major stakeholders in the country, plus SAA and Winrock, participated. The workshops and their outcomes mandated AUA to launch the program, and they provided broad guidelines on the content of the curriculum and the modalities of implementing the program itself.

AUA completed work on the program shortly after it was mandated, but it took another year before it was launched because of the time needed for consultations between the University Board of Governors and the Senate on the implications of the new program. The program was finally approved on the condition that it would not lead to the formation of a new department—meaning that its creation would not lead to demands for extra budgetary or other resources.

By the time AUA was ready to start the program, much of the decision-making power of the Ministry of Agriculture (the major supporter of the program) had been devolved to the regional governments as part of the decentralization program of the government. AUA, therefore, had to renegotiate the program with the 11 regional governments that constitute the Federal Government of Ethiopia. At this time, the program became more like a marketing exercise rather than the demand-driven program envisioned at the time of its initiation.

Taking into account the large geographic area of the country, the expected capacity of the program with few additional resources, and the high costs of supervising students' field practical activities, it was decided to start by recruiting students from only few regions at first. Consequently, the program began in February 1997 with the first intake of 30 students recruited from four regional governments.[1] In all, it took 3 years from the time the request was first made to the time the program became operational.

Scope and Activities

Level of Training and Duration

The Mid-Career Agricultural Extension Program at AUA currently concentrates on

training at the B.Sc. level. The program is special in many aspects as compared with conventional academic degree programs including the regular agricultural extension program in AUA and other universities in the nation or abroad.

The new program is aimed at promoting the skills and effectiveness of mid-career extension professionals in the country by equipping them with up-to-date theoretical and practical knowledge to enable them to tackle the ever-growing challenges in agricultural development. In contrast with the regular B.Sc. training programs of AUA, which last 4 to 5 years, the B.Sc. mid-career agricultural extension training requires only 2-1/2 years.

In this program, teaching and learning is a sharing of experience between the university staff, who have much of theoretical knowledge, and the students, who have rich field experience. Perhaps the most important characteristic of the training is its practical orientation, for it provides practicums, hands-on laboratories, problem-focused courses, and field-based supervised extension projects (SEPs). The philosophy of the SEPs, as described by Kolb (1984), is based on the experiential learning model. SEPs are organized in two phases. During the first phase, each student works for one crop season with one of the farmers in the vicinity of AUA. Then the students design individual projects, and after completing three semesters of course work, implement them in their work areas on a full-time basis over a period of 8 months.

Student Admission and Selection

In contrast to the regular B.Sc. degree training programs of AUA, which admit high school graduates who meet the normal university admission criteria set by the Ministry of Education, the mid-career program enrolls diploma holders who have several years of work experience in agricultural extension and development and related fields. In recognition of their broad practical experience before they join the program, diploma holders are eligible for admission, regardless of their cumulative grade point average. That means candidates with a cumulative grade point average as low as 2.0 upon graduation with a diploma are eligible, although admission of the same candidates to any of the university's regular programs as "advanced standing students" would require at least a 2.5 average.

To qualify for selection to the mid-career program, candidates

- must hold a diploma in agriculture or related fields
- must be recommended by their employers, usually based on their performance in the field
- must be sponsored by their employers
- should have served for a minimum of 5 years (though most of those enrolled so far have over 10 years of working experience)
- must pass an entrance examination set by the university

Female applicants are usually encouraged and, therefore, there is a tendency to give them more attention compared with male applicants during the selection processes.

Enrollment and Attrition

The program has so far enrolled three batches of students: the first intake of 30 students in February 1997, the second intake of 18 students in September 1997, and the third intake of 30 students in September 1998. The program is currently recruiting students for its fourth intake for

[1] Fifteen from Oromiya Region, eleven from SNNP Region, three from Harai Region, and two from Dire Dawa Administrative Council.

TABLE 1
Student enrollment and attrition by gender and intake.

	Enrollment	Attrition	Difference
	First intake		
Male	27	2	25
Female	3	–	3
Total	30	2[a]	28
	Second intake		
Male	17	–	17
Female	1	–	1
Total	18	–	18
	Third intake		
Male	25	3	22
Female	5	1	4
Total	30	4[b]	26
	Fourth intake (planned)		
Total	30		

a/ Failed. b/ Withdrew due to health problems.

the 1999–2000 academic year, which will commence in September 1999. An enrollment of 30 students is planned (table 1).

Graduation

So far, in this young program, only students from the first intake have reached graduation. As indicated in table 1, 28 students are graduating. Two students of this batch will not graduate in 1999 for academic reasons. However, one student who failed one course during his final year is eligible for graduation during the next academic year on repeating and passing the course.

Major Institutional Stakeholders and Actors

The principal stakeholders of the program are AUA and the agriculture bureaus of the 11 regional governments of the country. Under memoranda of understanding these parties have signed, AUA has agreed to run the training program by providing competent staff and facilities, and the regional governments have agreed to release staff for training with full salary during the entire period and to re-absorb them when they have completed their studies. Several NGOs and research institutions have also started training their staff under the same arrangements. We expect other institutions to make use of the program in the future.

Other key partners, rather than stakeholders, in the program are the Sasakawa Africa Association and Winrock International. These organizations have been catalysts and facilitators. At present, the mid-career training program at AUA is one of the beneficiaries of the Sasakawa Africa Fund for Extension Education established in 1993 to support efforts directed at strengthening extension education.

Major Beneficiaries

Among the numerous and diverse beneficiaries of this responsive and innovative mid-career agricultural extension B.Sc. training program at Alemaya University are

- the regional governments of the country, particularly their bureaus of agriculture, and the Federal Bureau of Agriculture
- the mid-career agricultural extension professionals of the nation
- the small-scale farming community and the national economy
- the regional and national research institutions and centers of the country, along with their research and support staff
- NGOs and private firms involved in agricultural development activities

In addition, Alemaya University of Agriculture, SG 2000, and Winrock International can perhaps be considered beneficiaries.

Achievements

The achievements of this young program are by no means small:

- giving AUA the experience of developing and implementing nonconventional training programs designed to meet the

specific demands of client groups
- providing AUA and the Faculty of Agriculture the opportunity to experiment on running such tailored programs
- providing AUA the opportunity to work in a closer contact with its major stakeholders and vice versa
- enabling the Department of Agricultural Extension and the Faculty of Agriculture to strengthen its staff and teaching facilities
- training and preparing 28 B.Sc. degree candidates from its first intake of mid-career agricultural extension professionals for graduation in 1999
- progressing with training of 18 students of the program's second intake and 26 students of its third intake, as well as recruiting students for its fourth intake
- rapidly producing trained personnel by reducing the duration of study to only 2-1/2 years through efficient use of time and omission of courses that are less relevant to this cadre of professionals
- producing graduates who have secure job placements and thus resume serving the nation immediately after graduation

Challenges to the Training Program

The lack of prior experience in developing and implementing demand-driven training programs and curricula that markedly deviate from conventional academic approaches was the major challenge to AUA, particularly during the planning and early implementation of the program. Moreover, when institutions of higher learning—which are deeply rooted in and guided by the demands for conventional academic approaches—are expected to change radically, certain conditions must be fulfilled, and this process has left its mark at the university, faculty, and department levels. An important precondition is the presence of a catalytic environment that enables the stakeholder community to conceptualize, intellectualize, and articulate its needs. Other constraints and challenges to the program and to the university include:

- Resistance by certain sections of the academic community to fully accepting that the specially designed social science curriculum carried out over just 2-1/2 years is equivalent in academic rigor to other programs of study within the university, which require 4 to 5 years to complete.
- Uncertainty about financial resources needed to cover the high expenses of the candidate-recruiting process and the staff supervision of the students' SEPs.
- Insufficient awareness of sister departments about the exclusively interdisciplinary nature of the program and the need therefore for collaboration and a feeling of ownership of the program and its activities.
- Reluctance of sister departments to offer courses to other programs with minor differences in naming, course codes, credit hours, semester scheduled, or course description.
- Misunderstanding by a few regional governments about the purpose of the program, resulting in refusal to send their employees for training with their full salaries.

Conclusions

Analysis of the evolution and launching of the program discloses that AUA has taken a bold step toward breaking down the resistance to change so common in universities. Moreover, the program is a success story for the university, faculty,

and in particular the department hosting the program as well as its supporting organizations—SG 2000 and Winrock International. It has operated for three academic calendars without significant difficulties and is graduating its first students this year. In addition, the program has demonstrated that a high degree of partnership can be achieved between training institutions and employers who use their products, provided they share a common vision. However, this can by no means be considered the end of the story. It only indicates the future efforts needed for continued success and increased impact of the training program.

Recommendations

This is a young program with a completely new design and structure, which has experienced strong resistance and challenges. As a result, many aspects of the program remain to be fully developed:

- Promoting the program objectives and design among all stakeholders so they develop a feeling of ownership and responsibility toward the program.
- Developing and expanding the program through networking for common benefits with pioneer institutions, such as the University of Cape Coast, Ghana, and learning from their experiences
- Securing reliable financial resources and assistance from the major stakeholders and soliciting more who can be of help.
- Building the program's capacity in line with practical training within the AUA campus, e.g., establishing a "technology village" on campus for demonstration, evaluation, and monitoring of improved local and introduced agricultural technologies as a possible resource for candidates' off-campus SEPs and to help the farming community through farmers' days and farmer group visits to the technology village where students of this program participate in the activities.
- Creating a healthy atmosphere and close working relationships between and within academic and administrative departments, staff of the Faculty of Agriculture and other faculties of AUA, and all other stakeholders of the program.
- Improving the capacity of the department staff through provision of Ph.D. training to run the program more effectively and efficiently.

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Case Study of Innovative Agricultural Extension Training

University of Dschang, Cameroon

Tchala Abina François and Kamga André

Agricultural training started in Cameroon during the colonial era. In May 1960, only 5 months after independence, the first agricultural training school, Cameroon National School for Agriculture, was established. In 1963, this school was integrated with Cameroon Federal University as the Federal School for Advanced Agriculture (EFSA). In 1973, following the advent of the unitary state a year earlier, it became the National Advanced School of Agriculture (ENSA). It was situated at Nkolbisson on the outskirts of Yaounde where it had a large field for experiments.

University centers were established in 1977, and ENSA was merged with the University Center of Dschang in 1978. In 1989, to professionalize agricultural training, the state established the National Institute for Rural Development (INADER), which brought together the former Institute of Technical Agriculture (ITA) and ENSA.

University reforms in 1993 established six universities in Cameroon, among which was the University of Dschang. By decree, the university was endowed with five faculties—the Faculty of Agronomy and Agricultural Science, Faculty of Science, Faculty of Law and Legal Science, Faculty of Arts and Humanities, and Faculty of Economic Science and Management—and two institutes of technology.

Development of Training in Agricultural Extension

Some years after the establishment of the first training school for agricultural engineers, the government set up a structure for training farmer management staff on a low level. This was how the National College of Agriculture (CNA) was established in 1963 in Dschang in Western Cameroon province. The objectives of CNA were to train capable agricultural technicians to give support to the field engineers. The recruitment examination was open to holders of secondary school certificates (BEPC). The engineers were to be responsible for the design of technology, and the technicians were to be responsible for application at the farmer's level. The training of technicians was under the supervision of the Ministry of Agriculture, while training of engineers

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was under the supervision of the Ministry of National Education.

In 1977, due to concerns about the training of intermediate staff, the government established ITA, which replaced CNA. This new organization was placed under the supervision of the Ministry of Higher Education. It had two training sessions. The session for agricultural technicians was open to holders of the GCE "O" levels. The session for engineers of agricultural disciplines was opened to the holders of high school certificates, scientific grades C or D, or the GCE "A" level.

The first experience in research-development-training in Cameroon took place at ENSA in the 1970s, in the Yemessoa region, 60 kilometers from Yaounde. ENSA students enrolled in their last year of training. Once a week, they went to different villages of Yemessoa where they worked with farmers on a food crop, a perennial crop, or on livestock production. A follow-up program for all activities was set up, and students participated actively in all steps of production. Problems uncovered by students in the field were presented to technical departments when the students went back to campus. The next week, students returned to the field with solutions. The students therefore linked the farmers and the technical division of the training school. This activity gave the students field experience and the opportunity to assess and contribute to some small projects with farmers.

A similar activity started in 1983 in Bafou in the Menoua division (Western Province) before it was institutionalized in 1985 within the framework of ITA at the Dschang University Center. It continued after the reorganization of the Dschang University Center and the advent of INADER in 1989. It is now the responsibility of the Faculty of Agronomy and Agricultural Science of the University of Dschang.

Current Activities of the Program

Level of Training

The Faculty of Agronomy and Agricultural Science of Dschang University trains engineers in five options—crop production, animal production, forestry, agricultural engineering or mechanized agriculture, and economy and rural sociology—leading to a diploma in engineering. A session leading to a masters of science in water management has been in operation for two academic years. And in 1998, a session leading to the diploma of senior technician in agroforestry was opened, and it enrolled 25 students.

Distance Education Program

The Faculty of Agronomy and Agricultural Science has a Distance Education Unit that offers courses by correspondence to participants throughout the country. This program enabled many people to go through the training. The rate of course completion depends on how fast the individual can assimilate the previous lessons and how fast he or she can do the relevant homework for each chapter that has been covered.

Duration of Training

The duration of the training of engineers is 5 years after the high school grades C or D. Admission is based on an entrance examination for Cameroon students. For foreign students, it is based on their curriculum vitae through applications from their states or international organizations.

For the master of science in water management, the duration of training is 2 years. Admission is based on the study of the candidate's curriculum vitae and

requires either a B.Sc. degree in natural science or an engineer's diploma in agriculture plus field experience.

For the diploma of senior technician in agroforestry, the training duration is 2 years after the high school grade C or D. Admission is based on an entrance examination for Cameroon students. For candidates from other countries, admission is based on their curriculum vitae with the equivalent requirements. The program began during the 1998–99 academic year.

Important Achievements

Registered Students

Under the former training organizations (ITA, ENSA, and INADER), around a hundred students per year were admitted. At the Faculty of Agronomy and Agricultural Science, 250 students, admitted on the basis of their CVs, were in the first batch (1993). Since then, all other student have been admitted through an entrance examination. The number of candidates for the entrance examination into the Faculty of Agronomy and Agricultural Science increases from year to year. Currently, around 135 students a year are admitted.

Students Trained

The University of Dschang, through various forms of training (EFSA, ENSA, INADER, ITA) trained 1,285 agricultural technicians between 1977 and 1993, 1,115 engineers of agricultural disciplines between 1977 and 1991, and since 1993, 1,323 agricultural engineers, 34 of them from countries within the sub-region (Benin, Chad, Central African Republic, Senegal, and Gabon).

These statistics do not include diplomas awarded technical agents, agricultural technicians, and senior technicians trained by the Ministry of Agriculture at the Dschang National College of Agriculture between 1963 and 1977 and in the regional colleges of agriculture—Maroua, Ebolowa, etc.

With the advent of university reforms, the training of agricultural technicians and engineers of agricultural disciplines was suspended in the new university organization. This was why since 1993 the Faculty of Agronomy and Agricultural Science only trained engineers within the five areas mentioned earlier. The first batch of candidates left in March 1999.

Main Actors

Apart from funding by the Cameroon government, agricultural training in Cameroon has benefited for many years from the financial support of international organizations from Belgium, Netherlands, France, and USA. In 1982, the United States signed a loan and grant agreement with the Cameroon government for the institutional development of the university centers. This agreement called for the establishment of an institution modeled on the land-grant college system of the United States, integrating training, research, and extension. Within the framework of this agreement, the institution was, within few years, able to:

- train teachers at higher levels
- build an ultra-modern campus
- acquire important documentation for the library
- revise the training programs for greater professionalization of the students
- establish a basis for more formal collaboration with the research institutes

Beneficiaries

The main beneficiaries of the training program are the agencies using the diploma holders among which are the ministries of agriculture, environment and forestry, livestock, and food industries, as

well as NGOs and the countries within the sub-region.

Constraints

The important constraints are infrastructure, funding, laboratory equipment, and logistics for field trips and study tours.

Steps to meet the economic crisis in Cameroon have greatly influenced the smooth running of the training program, particularly the students' field assignments and study tours. The vehicle fleet has been greatly reduced, seriously affecting students' transportation.

The loan and subsidy agreement with the U.S. government made it possible to build a campus (office, laboratories, dormitories, and libraries) for the Dschang University Center. But the establishment of the university with five faculties was not accompanied by the development of appropriate infrastructure. The five faculties therefore operate with highly limited facilities. In the first year, the number of students in some faculties exceeded 1,000 students whereas the largest amphitheater had only 600 seats.

Recommendations

To improve working conditions, solutions to the issues of infrastructure, laboratories, and laboratory equipment are needed. And priorities should be given to transportation of students for field trips and study tours.

The world economic crisis has caused halted the contributions from some donors who had supported the building of the institution. Efforts should therefore be made to revitalize international cooperation with other funding agencies.

Conclusion

Agricultural training in Cameroon has undergone many changes since independence. Through the various periods, the professionalization of the students has always commanded the attention of various partners. Educational reforms integrating research and agricultural extension were beneficial to the institution, as well as to the students and employees of the diploma holders. At present, the human potentials are available. What needs to be done now is to put appropriate means in place.

Case Study of Innovative Agricultural Extension Training

University of Cape Coast, Ghana

A. G. Carson

Most of the 150,000 agricultural extension staff in sub-Saharan Africa lack appropriate training beyond secondary school (FAO 1990; 1993; 1996; Swanson 1990; Zinnah, Steele, and Mattocks 1998). This deficiency hampers the efforts of governments, NGOs, and other agencies to assist resource-poor farmers and to improve links between farmers, researchers, and extension staff.

In Ghana, as in many African countries, agricultural extension is largely publicly funded and managed. One of the critical problems facing extension is the inadequate training of agricultural extension staff at all levels. Tetebo (1993) estimated that 83 percent of the current extension staff of Ghana's Ministry of Food and Agriculture (MOFA) possess only 2-year post-secondary school certificate qualification. Only about 11 percent of the extension staff possess academic qualifications at the diploma level, 5 percent at the B.Sc. level, and 1 percent at the master's level. It is apparent that innovative training programs are needed to upgrade the technical and human relations skills of agricultural extension staff in Ghana and other African countries, especially talented mid-career extension staff who generally perceive their professional careers as a dead-end road. Agricultural universities and colleges in Africa have a critical role to play in this process.

Evolution of an Innovative Agricultural Extension Training Program

The emphasis of the B.Sc. Agricultural Extension Program at the University of Cape Coast, Ghana, is on experiential learning (Kolb 1984). After a period of training on campus, the students return to their respective work areas to undertake 4- to 6-month off-campus action research projects, which are commonly referred to as supervised enterprise projects (SEPs). The SEPs focus on real on-farm situations. The choice of topics for the SEPs is highly influenced by the students, their employers, and the clientele/beneficiaries (farmers or farmer groups).

Zinnah and Naibakelao (1999) succinctly point out several factors that were crucial to the smooth start-up and successful implementation of the B.Sc. Agricultural Extension program at University of Cape Coast (UCC).

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First, there was a strong partnership between MOFA, UCC, Sasakawa Africa Association, and Winrock International. All the partners agreed that change was necessary to ensure the development and implementation of a relevant extension training program in Ghana. Therefore, the discussions among the representatives of the partner organizations that led to the taking of decisions about the preparation and review of the curriculum and the eventual start-up of the training program at UCC were characterized by frankness and open-mindedness.

Second, the Academic Board of the University of Cape Coast was flexible and accommodating in reviewing and approving the new program. The board was willing to risk offering the need-based, responsive, degree program for MOFA, even though some board members feared that the mid-career extension staff would fail to perform up to the expectations of the partner organizations. They were also concerned about the acute shortage of qualified agricultural extension teaching staff at UCC to nurture the new program.

Third, MOFA promised to send its staff to the program on study leave with full pay and to be responsible for providing them with accommodations. In addition, the ministry agreed to live up to the university's academic standard for admission of students and to assist the university with instructional materials to facilitate the teaching-learning process.

Fourth, Sasakawa Africa Association agreed to provide the initial resources for the program, including supporting an agricultural extension specialist to lead the start-up of the program at UCC, purchasing instructional materials, and funding the implementation of the off-campus SEPs.

Fifth, Winrock International agreed to partner with Sasakawa Africa Association (SAA) in providing the leadership in the development and implementation of the program. It seconded one of its agricultural extension specialists to UCC to coordinate the start-up and implementation of the extension training program.

Scope and Current Activities

From 1993 to 1998, UCC was running a two-tier program leading to a B.Sc. degree in agricultural extension. The basal tier was a 4-year (eight-semester) B.Sc. program for holders of a post-secondary school certificate in agriculture or related fields. The top tier was a 2-year (four-semester) B.Sc. program for holders of a post-secondary school diploma in agriculture or related fields. The university ended the admission of students into the 4-year post-certificate program after the 1998 academic year. This action stemmed from a 1997 internal review of the program. The Ministry of Food of Agriculture, the main stakeholder of the program, felt that the duration of the 4-year post-certificate program was too long to keep mid-career staff away from their duties and families. It was recommended that a 2-year diploma program for certificate holders should be launched in one of Ghana's agricultural colleges.

Currently, 76 students (29% female), including two from Nigeria and one from Mozambique, are enrolled in the program at UCC. Of this number, 51 are post-certificate students, and the rest are post-diploma students.

Institutional Stakeholders

The main institutional stakeholders of the program are MOFA, UCC, SAA, and Winrock International. They are all making significant contributions to the implementation of the program.

Important Achievements

The program has had many significant accomplishments.

Fifty-one students (20% female), including two Nigerians, have graduated from the program. Twelve of the students, including two females, graduated with First Class honors. In UCC's 1998 graduating class of more that 2,000 students, the best student overall was from the B.Sc. agricultural extension program. These graduates are now playing important roles in agricultural extension organizations in Ghana and Nigeria.

A seven-member Consultative Management Committee, consisting of representatives of MOFA, UCC, SAA, Winrock International, farmers, and agribusiness has been created to ensure ownership and sustainability and to maintain strong working relationships among the key stakeholders. The committee is to review the curriculum periodically, examine and approve budgets, and provide recommendations on mechanisms for fund-raising and other issues deemed important to the smooth running of the training program.

The off-campus SEPs have promoted greater interaction and partnerships between UCC staff and students and bilateral agencies, NGOs (e.g., World Vision International, GTZ, SG 2000, Self-Help Foundation), and Ghana's District Assemblies. Some of these organizations have provided funds and other support to the SEPs that cut across their field activities in Ghana. A 30-minute documentary film, *Breaking the Mold: Bringing African Universities into Development* (SAA 1997), which highlights the main philosophy and key components of the agricultural extension training program at UCC, has been favorably received worldwide.

Lecturers associated with the program at UCC have gained greater exposure to the farming communities across the country. The innovation of the program at UCC is the SEPs component. The SEPs provide lecturers with the opportunity to travel to various parts of Ghana to supervise student projects. These visits enable lecturers to match on-campus theory with off-campus, real-life experiences in the diverse context of agriculture in Ghana. The visits also allow lecturers to interact with farmers and extension staff. In addition, some lecturers in the program have received support from Sasakawa Africa Association to attend professional workshops and conferences both within Ghana and elsewhere.

Significant progress has been made in gender-sensitive admissions. Female admission increased from 21 percent in 1993 to 29 percent in 1999. This is an important achievement because it will help in increase the availability of trained female extensionists for leadership positions in the extension system in Ghana.

As a result of the extension training program, UCC now has a modern Centre for Continuing Education in Agriculture (named the Sasakawa Centre), dedicated in 1995. The Sasakawa Centre was constructed with contributions from MOFA, U.S. Agency for International Development, UCC, and SAA. The Sasakawa Centre includes a 25-room accommodation capable of housing 75 students enrolled in the program. It also has an excellent conference center suitable for up to 75 participants, and two small group discussion rooms, with a capacity of 20 to 30 participants each. The Sasakawa Center also has offices for staff of the Department of Agricultural Economics and Extension.

A "technology village" is being developed at the University's Teaching and Research Farm. The technology village will have prototypes of various nontraditional income-generating farm enterprises,

including mushroom growing, beekeeping, snail rearing, inland fish farming (aquaculture), grasscutter rearing, and agro-processing. The technology village will be used for teaching, research, and the training of farmers and extension staff in nontraditional farm enterprises for income generation. The development of the technology village is based on experience gained from the off-campus SEPs. Experience from the SEPs has shown that nontraditional farming activities are being well received by farmers and other stakeholders.

Based on the recommendation of the Consultative Management Committee, plans are being completed for launching a 2-year diploma program in agricultural extension in the 1999–2000 academic year at Kwadaso Agricultural College in Kumasi for staff who currently possess certificate credentials. The program will be affiliated with UCC and will complement its post-diploma B.Sc. agricultural extension degree program. UCC can then increase its annual intake of students and concentrate on the post-diploma B.Sc. degree program.

Challenges to the Training Program

The challenges to the program have been well documented by Adjepong (1999) and Zinnah and Naibakelao (1999).

Limited Number of Qualified and Committed Core Staff

The program at UCC emphasizes experiential learning, especially the off-campus SEPs component of the program. The experiential learning approach is staff-intensive and requires competent and committed staff. Currently, UCC has too few qualified core staff for the successful implementation and long-term sustainability of the program. The Department of Agricultural Economics and Extension, in which the program is based, has only two full-time Ghanaian lecturers and a part-time expatriate lecturer with Ph.D. degree in agricultural extension. Three young lecturers with M.Phil. degrees in agricultural extension have been recruited. The staff quota for the department has also been increased. However, this number is still inadequate for the smooth running of this staff-intensive, innovative program and threatens the sustainability of the program.

Financial Constraints

A training program that places a premium on off-campus, farmer-focused learning requires steady funding for transportation, lodging, and per diem for the supervisory staff. Diminishing budgetary allocations for tertiary education in Ghana poses a serious constraint to the implementation of the program at UCC.

To overcome chronic funding problems, the principal stakeholders of the program, MOFA and UCC, are developing some modalities for sustaining the program:

- MOFA is working out a plan to include the cost of running the program, especially the SEPs component, in its annual budget.
- UCC has submitted proposals to national and international donors for grants to sustain the program, especially the SEPs component.
- UCC is securing a loan to add 20 rooms to the Sasakawa Conference Centre to accommodate conference and workshop participants, as a way to generate additional income to sustain the program.

Reorienting Academic Staff and Administrators

The curriculum of the training program is built around a systems approach, in which

courses are jointly planned, taught, and assessed by lecturers from diverse academic disciplines and departments. This activity requires thorough orientation or reorientation of lecturers to help them appreciate the tremendous benefits of a systems approach and how it can be used in designing and implementing academic programs. The program is overcoming this constraint by involving lecturers in the other academic departments and faculties in the teaching of courses and in joint supervision of students' off-campus SEPs. This benefits lecturers and students in the program by forging and nurturing a co-learning spirit in the School of Agriculture at UCC.

Promoting Diversity in the Training Program

Another challenge to the innovative training program at UCC is that there are few women in the current pool of mid-career extension staff in Ghana. The shortage impairs efforts to increase female enrollment into the program. This constraint cannot be overcome by MOFA or UCC alone. It requires a holistic national approach—one that productively promotes women's education in the sciences from the primary school level to the tertiary level.

Decentralization of MOFA

MOFA is decentralizing to increase the involvement of people in decision-making at all levels and to unify agricultural extension services. All field staff of the major departments (crops, livestock, veterinary services, etc.) now operate in a Unified Extension Service. Decentralization has implications for the training program because the extension staff who will be sent to the training program will come from diverse, and non-extension, backgrounds. This situation requires a reform of the curriculum to make it more responsive to the needs of extension staff who have diverse professional backgrounds.

Expanded Role of the Private Sector

The SEPs have shown the great potential for strong support and partnership between UCC and the private sector, especially NGOs and bilateral agencies. However, the linkage between the program and the private sector is still weak. Ways must be found to involve the private sector in the curriculum and management aspects of the program. FAO (1998) urges agricultural education and training planners to be alert to the needs of the private sector and, wherever feasible, to involve the private sector in training programs, especially institutional management and curriculum aspects, and to encourage private enterprises to provide field attachment training and some financial support for the program.

Support from Donors and Private and Public Agencies

The mother of all challenges is to get the donor community, private and public agencies, and NGOs to support the UCC initiative. The challenge is to prepare well-defined and responsive grant proposals to submit to the donor community and private agencies to get financial and technical support for UCC-type initiatives in Ghana.

Recommendations

Several factors have led to the success and impact of the extension training program at UCC. Adjepong (1999) and Zinnah and Naibakelao (1999) have documented the following important points.

Committed Leadership with Clear Vision

Strong leadership is a major condition for starting and successfully implementing any innovative program. The leaders must be focused on and committed to the main priority—a responsive extension training program. The leaders of MOFA, UCC, SAA, and Winrock International did not waver or back off even when questions arose about the ability of the mid-career extension staff to conform to the rigorous academic standards of the university.

Dialogue and Consultations with Stakeholders

Genuine dialogue and consultations between the stakeholders (MOFA, UCC, SAA, and Winrock International and other public and private agricultural institutions and agencies) was necessary for the development and implementation of the responsive, client-driven extension training program. The UCC initiative has demonstrated that developing university and college training programs through genuine consultations and dialogue with various stakeholders engenders strong commitment and support, ensuring the sustainability of the programs.

Systemic Organizational Change within the Partner Organizations

For an innovative curricula reform initiative to succeed, it is important for the main participating organizations to introduce a flexible and accommodating mode of operation to ensure that the client-driven and learner-centered approach that undergirds the program permeates each organization. Being willing to modify, and sometimes change, program direction when the need arises is an important characteristic of successful training programs. Such a systemic organizational change should involve key people working at different levels within the organization. This involvement enables individuals to view the program as an integral part of the overall programs of their organization, rather than as a tangential activity.

Partnerships with Organizations Committed to the Same Vision

One of the most important ingredients for the start-up and sustainability of any innovative extension program is partnership with other agencies and organizations, both public and private, that are concerned about the same problems and committed to a shared vision. Only through partnerships can the multifaceted problem of training of extension in sub-Saharan Africa be resolved. UCC is networking with other universities and colleges that are committed to developing responsive training programs for mid-career extension staff in Africa. Links already exist between UCC and Alemaya University in Ethiopia, Sokoine University of Agriculture in Tanzania, Makerere University in Uganda, and Kwadaso Agricultural College in Ghana.

Monitoring, Evaluation, and Documentation of Impact

It is important to develop a framework and a set of criteria for monitoring, evaluating, and documenting the impacts of the training program. Among the steps UCC has taken are regular internal reviews, recommendations from the Consultative Management Committee, and external reviews of the program. These assessments will provide tangible data to stakeholders about the usefulness and impacts of their investment.

Conclusion

This paper has outlined the evolution of an innovative training program at the University of Cape Coast in Ghana for

upgrading the technical and human relations skills of mid-career agricultural extension staff, who for the most part, perceive their professional careers as a dead-end road. Clearly, when pressure from the larger community (e.g., MOFA) meets action rather than inertia by a university (UCC), adjustments to new conditions are hastened, and positive results can be achieved for the university and for the larger community on which the university depends for its sustenance.

The University of Cape Coast program has been implemented with great success. However, it faces several urgent challenges including (1) the need to adapt the UCC model for use in other African countries (already Ethiopia, Uganda, and Tanzania have adapted the model for training their mid-career extension staff), (2) the need for partnerships between the various actors in agricultural education and training at the tertiary level in sub-Saharan Africa in order to bring their combined strengths to bear on the multifaceted problem of training mid-career extension staff, and (3) the need to get the donor organizations, technical assistance agencies, NGOs, and governments to support training initiatives for mid-career extension staff in sub-Saharan Africa, where a majority of the estimated 150,000 agricultural extension staff lack training opportunities.

The UCC experience and the experiences of Alemaya University in Ethiopia, Makerere University in Uganda, and Sokoine University of Agriculture in Tanzania have clearly demonstrated that with modest investments, it is possible to develop the human resource potential of the thousands of mid-career extension staff in sub-Saharan Africa. The financial and technical assistance from Sasakawa Africa Association and Winrock International have lit the torch. The main challenge for national governments, donor and technical assistance agencies, and NGOs is to team up with Sasakawa Africa Association, Winrock International, and agricultural universities and colleges in sub-Saharan Africa to address the training needs of field-level, mid-career extension staff whose leadership potentials have not been fully tapped.

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Private-Public Partnership in Training Extension Professionals

Olivia Muchena

Some sentiment and truth in an article in *Spore*, April 1999, have a bearing on our continuing endeavors to improve agriculture and eradicate poverty in Africa. The article cites Mahatma Gandhi's assertions earlier this century: "Poverty is an insult, poverty stinks. It demeans, dehumanizes, destroys the body and the mind . . . if not the soul. It is the deadliest form of violence. Worst of all, poverty persists and outlives even the most imaginative strategies to alleviate it." Gandhi further declared that agriculture had grown into an economic activity that has become so distorted that it only meets some people's greed but not everyone's need.

From 1985 to 1990 the number of the poor in sub-Saharan Africa rose from 184 million to 216 million, or half the population. That means one in eight people cannot afford enough food to lead a productive working life. In the mid-1990s, an estimated 1.1 billion people worldwide lived in absolute poverty, that is, on less than a dollar a day. This number increases at about the same rate as world population so by the year 2000, it will reach 1.3 billion.

These statistics are frightening and should be the concern of all professionals in agriculture, assuming that we agree that agriculture can reduce poverty. It has become imperative to grow more food, and fast, because food production in most African countries increases at a slower rate than their populations. But it appears that it is not first a question of what to do about improving agriculture, but how to do it, and under what conditions. This is a major challenge. It has been said that no amount of capital investment in projects and programs will surpass the critical area of investment in human capital. It is apparent that successful investment in human capital is a function of how it is done.

What Have Years of Agricultural Education, Research, and Extension Achieved?

It remains a widespread concern that most small-scale farmers in Africa still live at or below the subsistence level despite the long years of agricultural education, research, and extension. Ironically, despite larger numbers of trained extension agents, national per capita incomes continue to decline. According to McCalla

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(1997), during the period 1969–71, 76 percent of the undernourished lived in Asia and 11 percent in Africa. For 1990–92, the figures were 60 percent in Asia and 25 percent in Africa. This raises such questions as: Is the appropriateness of agricultural education, research, and extension, at stake? And particularly in Africa, to what extent has education, research, and extension been able to empower populations to fight against poverty through agriculture? To what extent have small-scale farmers been considered bankable?

Misconceptions about the roles of agricultural education, research, and extension have also prevailed. The major mandate of agricultural education has been viewed as imparting the science of agriculture, while the role of research ends when a solution to a given problem is achieved in the laboratories or experimental fields, and adoption of the findings is left to extension services. This model of education, research, and extension is widely criticized because of its poor impact on the rural farmer. An ideal situation would be cooperation or participatory education, research, and extension that changes the farmer from being on the receiving end to becoming a full partner in agricultural development. The farmer, the agricultural educator, the researcher, and the extensionist should therefore indirectly influence each other's role.

It has to be accepted that the farmers are very rational people who know what they want. They have adapted to their environment. They can relate practically to economic issues. It is unproductive to make careless generalizations about why farmers use certain practices, strange though they may be to us. There are large gaps in our pool of expertise. One often wonders whether in our quest to diagnose the farmer's problems, the farmer is not in fact diagnosing our deficiencies more ably! The farmer of today has noticed with concern a "fix" of practices by the extension agent as a result of standardized production packages and extension messages. Some extension agents have parroted solutions and messages created at research stations hundreds of kilometers from farmers' fields. Extension is supposed to be problem-oriented, i.e., focusing on the problems of farmers. Ideally it provides diagnosis with cure, but the prevailing scenario is either diagnosis without cure or cure without diagnosis

Basic training at certificate, diploma, or degree level does not seem to be adequately preparing personnel for agricultural education, research, or extension. Nor is it adequately preparing them to be direct producers. While it is acceptable that educational institutions do not produce ready-made products, there is a limit to which in-service training can correct the inadequacies of basic training. The challenge for all institutions of higher learning today is to restructure curricula to meet the development aspirations of their countries. Strong efforts should be made to review and adopt agricultural curricula to the new challenges facing the agricultural sector in Africa. Besides the conventional methods of agricultural education, research, and extension, new ways must be found to identify priorities and develop technologies. They have to originate from a growing appreciation of the validity and usefulness of indigenous knowledge, the insight provided by farming systems researchers, and the increasing recognition that farmers are themselves experimenting innovators. While basic investigations in stations and laboratories will always be needed, a complementary approach is also overdue. In it, farmers are primary. It is they who come first and who identify their own

priorities, and it is they who are key actors, choosing, experimenting, and adapting in order to survive and do better. The point is not that experts have nothing to say to farmers, but rather that farmers' knowledge and practical experience have been undervalued and not harnessed properly in partnership with the experts.

Of course farmers still need extension services. But researchers and extensionists should interact more, reverse the top-down communication and move into more of a technology exchange—a process by which people can develop their own agriculture, which also offers the best prospects of sustainable development. Such efforts reduce the cost of adoption and convert extensionism into communication.

Chambers (1991) discusses reversals and the institutional change needed—reversal of the roles of scientists, extensionists, or workers in NGOs, and an open learning process of a sort not encouraged by the content of college or university curricula. Chambers advocates a farmer-first approach and farmer empowerment. It is recognized that the time has come for institution building to change to institution revitalization, now that the universities, colleges, and institutes in developing countries are facing second generation problems. The entire mission of these agricultural institutions needs re-examination and restatement in broader terms.

Discussing the extension worker's professional skills, Bembridge (1991) noted that graduates from colleges and institutes can be particularly weak in all except agricultural science. Bembridge's four critical skills for successful extension are

- agricultural science
- farming skills
- communication skills
- human behavior

Institutions therefore need concomitant organizational change to shift from the fragmented, discipline-based model to cross-disciplinary structures integrated around a set of common themes and agendas. Small agricultural colleges, in particular, should capitalize on their comparative advantage, which lies not at the other end of spectrum where learning occurs in the application of knowledge to problem solving. Another change should embrace the philosophy of student education from an active role, with much more hands-on exploration of complex issues and much less passivity in the classroom. The concept of systems thinking in agricultural training will transform of agricultural education, research, and extension (Wilson 1988). In summary, agricultural institutions would have four new characteristics: their agricultural mission would go beyond production to enhancing rural well being in the broadest sense; they would have many more activities oriented to using rural areas as learning laboratories; their teaching philosophy would prepare graduates for problem-solving by analyzing and managing change; finally their basic organization would become a matrix of interconnected task groups clustered around major programmatic themes in place of dominant disciplinary departments. Added to the traditional dominance of the plant and animal sciences for production agriculture should be more of the social sciences to produce institutional capacity for influencing social and economic change in the rural sector. This fruitful combination has been thwarted in the past by preoccupation with technology development and diffusion derived from the physical sciences.

In summary topical challenges that have been pronounced by stakeholders concerned with agricultural productivity,

development, and extension delivery effectiveness include

- suitability of current curricula for the education, training, and learning processes of those who would like to take up extension as a career
- rising demand for appropriately qualified extension personnel with increases in population (as a result of greater demand for food and teachers at all levels of learning)
- inadequate institutional capacity for training of professionals
- declining fiscal provisions for agricultural research and extension
- literacy and numeracy levels of the major clients—marginalized smallholder farmers
- gender issues as they relate to the education, training, and participation of women in agriculture, who provide most of the agricultural labor in Africa and other developing areas

What partnerships could be forged to enhance training of extension professionals, considering the topical issues above and specifically looking at the increasing demand for appropriately trained extension professionals, inadequate institutional capacity, declining fiscal provisions, limited resources and experience to cope with new areas of training in agriculture and extension, and poorly developed curricula at colleges and universities?

Challenges

Challenges facing colleges and universities include

- the sustainability of the current system in which most of the support for colleges and universities is public funding, while on the other hand, government funding is declining
- the suitability of college graduates for extension work, given curricula based on agricultural sciences
- capacity of bureaucracy for liaison and establishing collaboration and active joint programs with other stakeholders

Challenges facing institutions involved in in-service training include

- upgrading and updating existing extension professionals, i.e., certificate, diploma, and degree holders, on appropriate technologies and processes for empowering communities and promoting agricultural and rural development
- adequacy of the nation's institutions, resources, and facilities for upgrading and updating of current extension professionals

New Directions

The private sector has for some years been active in agricultural extension in Africa, and the need to increase extension coverage and contain the costs of public extension has attracted a number of nonprofit, private organizations (NGOs). Commercial profit-making organizations have also increased their extension activities to complement and strengthen dissemination of information on their products or improve production of commodities. Farmer organizations representing both large-scale and smallholder farmers have also expanded their agricultural extension programs.

A common complaint by both students of agriculture and employers is that most of the training received is in technical agriculture, with little exposure to the important human side of agriculture, including rural sociology, communication, capacity to work as a team, problem solving, critical thinking skills, and business management.

An emerging positive development is

rising interest in innovative and cost-effective training of extension staff in Africa as the key to improving agricultural extension. Pluralistic and participatory agricultural extension should be given a chance to improve the funding, coverage, performance, stability, and impact of agricultural extension systems in Africa. Joint and collaborative support of extension training programs should be a strong feature in African extension systems. When the consumers and partners in agricultural education, research, and extension contribute funding, they then have a greater say in the processes of developing and implementing relevant curricula.

Innovation in Agricultural Extension Education and Training

The view of innovative systems is concerned with institutional and organizational conditions of technical progress in agricultural training. It is where new actors enter the scene. New forms of relationships emerge. Pluralism and collaborative arrangements become a fact. Innovative systems therefore are networks that organize around a common issue.

A handful of universities and colleges have embarked on innovative agricultural education and extension using the systems-thinking teaching and training methodologies to address to new demands, changing environments, and development aspirations. Universities cited as examples by Hakutangwi and Mongobo (1997) are Cape Coast in Ghana, Egerton in Kenya, Sokoine in Tanzania, Alemaya in Ethiopia, and Makerere in Uganda, and Open University in Zimbabwe.

A major extension curricula reform initiative, the Sasakawa Africa Fund for Extension Education (SAFE), began in 1993 and is under way at Cape Coast, Sokoine, Alemaya, and Makerere. Sasakawa Africa Association, in collaboration with Winrock International, helps these universities reform their extension curricula, making them responsive to the training needs of mid-career extension staff.

Another agricultural college outside Africa renowned for its innovation is the University of Western Sidney at Hawkesbury in Australia. Examples of innovative training programs with distinct capacity to empower smallholder farmers to the extent of making them equal partners in development are the Training for Self-Help Promotion in Benin and Training for Transformation in Zimbabwe and Kenya (Hakutangwi and Mongobo 1997).

A recent external evaluation of the B.Sc. agricultural extension program of the School of Agriculture, University of the Cape Coast, Ghana (Muchena, Vodouhe, and Atengdem 1999) revealed five keys to its success, uniqueness, and worthiness for replication and scaling up in Africa: institutionalization of innovations, curriculum development and core disciplines, supervised enterprise/experience projects, alternative funding for training and extension, and sustainability

Institutionalization of Innovations

The innovation was fully supported by the major actors: the Ministry of Food and Agriculture, the University of the Cape Coast, mid-career personnel, and the donor, Sasakawa Africa Association. The realization and endorsement of the critical need to support the career development of the mid-career staff made the program a breakthrough. The program frees certificate and diploma holders from the stigma that certificates and diplomas are a dead-end qualifications.

Curriculum Development and Core Disciplines

The open attitude of the university and willingness to break away from the conventional charter outlook and rhetoric facilitated the development of a participatory curriculum with major parties, i.e., the implementers and consumers, agreeing on what should become core without compromising the university standards and quality of the degree. In such developments, there is always a danger of ending up with what some might regard as a second-rate degree. The graduates of this program are competing equally in the market with a slight edge in the field of extension when compared with holders of a B.Sc. agricultural degree with honors in livestock, crops, etc. The B.Sc. agricultural extension program includes a heavy component of communication, sociology, and behavioral sciences. This emphasis recognizes that Africa's agricultural problems are less technological than management and human factors.

Supervised Enterprise/Experience Projects

This concept of the Supervised Enterprise/Experience Projects (SEPs) borrows heavily from agricultural systems thinking at Hawkesbury in Australia. Bawden (1992) stated that unlike their counterparts in medicine, law, or even teaching, agriculture graduates do not have an clearly identifiable profession to enter when they leave the institution. There are, therefore, few guidelines to help in designing curricula appropriate to the practicing professional agriculturists. If it is not clearly known what graduates will actively do as practitioners in the field once they enter the work force, then it is difficult to help them learn how to do it while they are at university. In addition, the clients of the profession are not well known, nor are the problems they face well defined. Consequently it is equally difficult to decide what scientific and technical knowledge the graduates need.

These aspects speak favorably for the SEPs, which if well managed, facilitate participatory extension and technology development that will obviously encompass indigenous knowledge systems and gender in household food security. If the SEPs were reinforced with aspects of training for transformation or self-help promotion, the outcome would be resounding technological and civic empowerment. It has to be remembered, however, that the success of any approach or methodology is as good as the people delivering it. It is also true that a good approach is one that moves you out of your job. Training for transformation or self-help promotion, integrated pest and production management, farmer field schools, and farmer field workers do exactly this when properly managed. The SEPs have this capacity, too.

Alternative Funding for Training and Extension

Mainstream education and training of agriculturists in most African countries has been supported with public funds. Little support has come from the private sector. The introduction of structural adjustment programs in most African countries have invariably seen huge cuts in provision for agricultural training and in fiscal resources for public extension delivery institutions. This has led to a marked decline in in-service training so critical where agricultural institutions do not give sufficient grounding in some important disciplines that are prerequisites to successful extension execution, e.g., agricultural extension per se, communication skills, and diagnostic skills.

Shrinking government funding forces

training and extension institutions to seek alternative funding if the current services are to be sustained. The time is opportune to move away from government-owned extension and training to innovative systems. NGOs and private enterprises are mushrooming in Africa. Central government agencies are changing their roles and are no longer the sole providers of extension services. This is due to public-sector reforms, decentralization policies, privatization of formerly public agencies, and, often enough, to financial crises, which limit the range of activities that governments are still able to fund. While some public entities are being trimmed or even disappearing, other actors achieve greater autonomy and tend to pursue more particular interests.

Thus private enterprises are becoming more important as consequence of economic development, of more liberal market policies, and also of the globalization of markets and of information. These circumstances cannot be more ideal for more networking and partnership activities. Partnerships entail equal say—equal say in research, education extension, and training can lead to more dynamic and progressive programs and removing mind-sets and bureaucratic tendencies.

The Sasakawa African Fund for Extension Education is an excellent intervention and innovation. The success of the intervention is a challenge to benefiting countries who should gear themselves to sustain the program should Sasakawa eventually pull out. The move by many government organizations to go into cost recovery and consultancy services are steps in the correct direction toward sustaining programs initiated on partnership basis.

Sustainability

The long-term value of any program rests with the capacity to sustain it. The following are strong indicators of the sustainability of a program:

- Institutionalization of the innovation. Both the Ministry of Food and Agriculture and the University of Cape Coast seem to have internalized the program well.
- Interest and commitment to the innovation by the stakeholders: the university, ministry, Sasakawa Africa Association, and students.
- Availability of expertise in the discipline. Many institutions fail to implement new programs due to lack of qualified professionals to implement them. In this particular case, expertise in agricultural education and SEPs are prerequisites. It is important to maintain the interest of students, lecturers, supervisors, and stakeholders in the program. The experience of a participatory, demand-led approach seems the way forward.
- Duplication and replication of the program must run in tandem with new offers in terms of approach and content. Avoid simply trying to repeat what has been done before and elsewhere. Past experiences should instead be regarded as learning experiments, which can feed into other processes of change. To sustain interest, innovation and change have a major role to play.
- The SEPs and curricula make the UCC program unique, practical, and participatory. The curriculum is developed from identified development aspirations.
- The feasibility of executing the program through distance education on a modular basis. The success is dependent on how well the materials are written and the program is managed. Obviously for entrance qualification, mature entry rather than "O" levels

should be the norm. Because the students are drawn from those in employment, they should be able to pay in part for the education.

The message is for greater commitment to embarking on an innovative program, bearing in mind lessons learned from experiences at universities of the Cape Coast, Alemaya, Sokoine, and Makerere. There could be universities, colleges, and institutes out there that are set for change but with financing as their greatest predicament.

For example in Zimbabwe, the Ministry of Lands and Agriculture has a program for upgrading from certificate to diploma, but inadequate funding prevents going to full scale. Also there is the B.Sc. agriculture management program that was initiated by the College of Distance Education at the University of Zimbabwe and now being implemented by the Open University. While this modular distance education program is ongoing there are funding problems.

In addition a B.Sc. agricultural extension and education program, which I personally fought to introduce in the Faculty of Agriculture, University of Zimbabwe, aborted due to lack of funding and adequately qualified personnel to introduce the program. The University of Zimbabwe Faculty of Agriculture and five agricultural colleges would like to embark on innovative short courses for extension staff and farmers, but again funding is the constraint. There may be similar endeavors in other countries. Can the Sasakawa African Fund for Extension Education spread its wings and take up these pending programs? If not, my appeal is for other organizations to act like Sasakawa Africa Association for the benefit of Africa and particularly the smallholder farmers who are the major concern for all of us.

Conclusion

Therefore the potential for increased partnerships between government and the private sector exists in the training of extension professionals both at colleges and universities and for in-service training. This has been exploited to some extent in some African countries, but much more needs to be done.

The potential for strategic and smart partnership between academia, government, NGOs, and the private sector exists in various combinations. However, the realization of this potential is largely dependent on innovative and creative ways of doing things. The situation calls for the wisdom winnowed from the animal kingdom as the people of Guinea Bissau have noted in their folklore:

The lion is king, royal, powerful, but lazy.

The hippo is adaptable, able to operate on land and in water, but very territorial.

The monkey is intelligent and agile, but capricious.

The giraffe, elegant, beautiful, but can be clumsy with its head in the sky.

The tortoise is steady and security conscious, but very slow.

Strategic partnerships for training extension professionals require that governments, like the lion, use their powerful authoritative position without the bureaucratic red tape that often stifles creativity. Universities and their various disciplines need to be adaptable like the hippo but without the crippling territoriality. They also need to operate with the agility and intelligence of the monkey to create innovate programs, which will ensure that they will not remain in their ivory towers like the giraffe's head in the sky. The private sector does need the security of the tortoise to invest in human resource development without, of course, the slowness of the tortoise and the capriciousness of the monkey.

The involvement of the private sector including NGOs in the training of agricultural professionals calls for unprecedented levels of cooperation.

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Working Group Reports

Each of the five working group facilitators shaped and guided the process of the discussion within the boundaries of the overall workshop goals. They sought to make the final output of the small group sessions representative of a consensus within the group that engendered widespread ownership. However, group members were encouraged to "agree to disagree" on aspects of certain issues.

The primary intention of the working groups was to encompass inclusiveness for every participant, regardless of position or status. This participatory approach helped ensure that all deliberations at the workshop, including the plenary sessions, were consistent with the participatory philosophy of extension advocated throughout programs supported by the Sasakawa Africa Fund for Extension Education (SAFE).

While each working group was assigned a specific topic to discuss, several over-arching workshop themes invaded each group discussion, including

- human side of agriculture
- teaching-learning approach
- innovation
- complexity
- problem solving
- critical thinking skills
- interdisciplinary interactions
- rural, social, and political sensitivity
- communication
- teamwork

The five groups examined issues of responsive extension curriculum, financing extension education programs, off-campus supervised enterprise projects (SEPs), facilitation of partnerships, and innovation in francophone countries. The groups endorsed some of the existing principles of the mid-career training programs and challenged thinking in other areas.

The working groups recommended that an unambiguous vision statement would help focus and strengthen the SAFE approach. The key elements of a new vision statement should include leadership development, capacity for problem solving, and experiential learning.

The small groups also endorsed the participation of a broad range of internal and external stakeholders in all curriculum development, implementation, and evaluation activities associated with mid-career training programs.

The concept of preparing a new generation of extension workers who are responsive to a constantly changing social, economic, and political environment was echoed through each group discussion.

In addition, the search for viable mechanisms for financing SEPs was a recurring theme in discussions. Partnership funding was suggested, combining external funding for 5 years or so with strengthening local capacity to attain sustainability with national and institutional funding. The difficult necessity of implementing tuition and fees was also mentioned.

Several of the groups also recommended that each country undertake a study of their agricultural education systems, including examination of secondary and technical schools. A need for an aggressive academic staff development process at each participating university was identified and prioritized by more than one group. Linkages with the private sector, including NGOs, was consistently recommended.

The group concentrating on francophone countries noted that the vision, conceptualization, and conduct of extension is very different from those in anglophone areas of Africa. They confirmed that francophone countries need a more responsive extension training approach that emphasizes practical experience in addition to technical subjects.

The theme that the university must strengthen its linkages with extension practitioners in the field emerged in all discussions.

Finally, a commitment to the relevance and importance of an extended supervised entrepreneurial field experience for every mid-career extension worker was apparent in all of the small group outputs.

The reports of the five working groups, below, represent participant opinions.

1. Critical conditions for developing and implementing a responsive extension curriculum

The goal should be clearly stated in unambiguous terms. For the SAFE initiative the goal should be *leadership development with a capacity for problem-solving and an appreciation for experiential learning.*

To develop a *responsive* curriculum, internal and external stakeholders (partners) must understand the goal of the training program and work toward achieving that goal. From the start, each stakeholder should be part of the curriculum development process and should know its role and responsibilities.

There is a need to understand the policies of the country within which the program will be based, especially agricultural, educational, and rural development policies.

The curriculum must equip extensionists to operate in a rapidly changing environment (through studies of marketing, group formation, population and gender issues, and literacy). The emphasis must be not only on transfer of technologies, but on helping to address other needs of farmers as well.

There should be a strategy for staff development—to upgrade the teaching staff who will nurture the program (annual retreat, academic exchange program, workshops and conferences, opportunities for advanced degrees, etc.).

2. Issues and strategies for financing extension training programs

How do we build and maintain partnership among ministries of agriculture, education, finance, and local government, and NGOs and institutions of higher learning in terms of financial commitment?

- Start-up money: Local government, donors, and NGOs
- Additional funding: Principle stakeholders

How do we develop cost sharing mechanisms?

Operational costs

- University: Tuition
- Employer: Study leave with pay
- Sponsors: SEPs, running costs, materials, supervisory cost

Capital and investment cost

- External sources: transport, technical facilities and equipment, teaching materials, student hostels

What can you achieve using local and national institutional resources?

- Everything except, SEPs, Capital costs, and imports

How much external financing is advisable or desirable?

- At the beginning, matching funds are required
- Ratio (1:1:1)
- Probably for 5 years

How do we address sustainability of the programs?

At the university level

- Establish a continuing education center to provide outreach programs (income generation)
- Integrate the program into university activities
- Seek more income-generating activities
- Tuition and fees
- Encourage NGOs to fund SEPs

At the ministry level

- Include SEPs component in recurrent budget
- Continue paying salaries for those on study leaves
- Include SEPs in major proposals to donors
- Mainstream program into donor-funded projects
- Motivate university staff: Remuneration for extra workloads

Sustaining donor interest

- Local ownership
- Good performance
- External evaluation
- Continued need for what you are doing

3. Strategies for developing and implementing SEPs

Basic Question: What should the SAFE partners do to ensure that off-campus training in practical extension projects contributes to adequate preparation of mid-career students for agreed upon functions?

How do SEPs relate to the functions to be performed by mid-career extension graduates?

SEPs should allow students to practice the various skills they require in their workplace after graduation—in consultation between the department of agricultural extension and employers

Who should be involved in planning, implementing, and evaluating the off-campus projects? And what is the specific role of the farmer in student evaluation?

	Planning	*Implementation*	*Evaluation*
Employer	✓	✓	✓
Students	✓	✓	✓
Farmers	✓	✓	✓
Universities	✓	✓	✓
NGOs and private sector	✓	✓	✓

EMPLOYERS

Planning

- Identifying worthwhile projects
- Co-supervision modalities
- Budgeting

Implementation

- Follow-up through the co-supervisors
- Allocating resources
- Providing progress reports

Evaluation

- Supervision (co-supervision)
- Presentation of results at workshop

What minimum logistical support is required and who should provide what?

- Inputs (seeds, fertilizers, chemicals)
- Transport (vehicles, maintenance, operational costs)
- Per diems (students, supervisors, co-supervisors, drivers)
- Allowances for staff
- Stationary/computer facilities

4. Facilitating partnerships among stakeholders in extension training activities

What partnerships are needed and what should be their objectives and expectations?

Partnership

- National
- International

Objectives

- Exchange of information and experiences
- Seek funding of innovative extension training
- Advocacy for innovative extension training
- Responsive (demand-driven) curriculum
- Human resource development for extension

Expectations

- Sensitize decision makers
- Effective and efficient field-level extension staff

- Recognition of partners
- Opportunity to influence policies

Who are the potential partners?

National partners

- Universities
- Ministries (agriculture, education, finance, local government, rural development, etc.)
- Other agricultural colleges and institutions
- NGOs and CBOs
- Private sector
- Farmers

International partners

- Universities (departments)
- NGOs
- Donors (FAO, Danida, World Bank, etc.)

What should be the responsibility, commitment, and contribution of partners?

NATIONAL

Universities

- Leadership in curriculum development
- Selling or moving of innovative program to or through institutional set-up (authority)
- Committing staff and resources to program
- Reports (SEP, donor, etc.)
- Coordination and liaison
- Supervision of SEPs
- Contributing members to program management committee
- Input into curriculum of other institutions

Ministries

- Funding
- Resources and logistics
- Selection of candidates
- Leadership in collaboration with other ministries or agencies
- Provision of input into curriculum
- Guest lecturers
- Co-supervision of SEPs
- Guaranteed absorption of graduates
- Contributing members to management committee of program

NGOs/CBOs

- Funding and other resources
- Input in curriculum
- Co-supervision of students
- Participation in the development and implementation of SEPs
- Serve on program management committee

Private sector

- Potentially similar roles to NGOs
- Technical guidance

Other institutions

- Provide candidates for program
- Technical guidance

Farmers

- Development and implementation of SEPs
- Input into curriculum
- Feedback on SEPs
- Resources for SEPs

INTERNATIONAL

Universities

- Exchange of staff
- Exchange of information
- Joint workshops and publications

NGOs

- Funding
- Resources and logistic support
- Technical assistance

Donors

- Funding
- Provision of other resources

What strategies are needed in fostering partnerships?

- Set up coordinating secretariat and coordinating institution
- Jointly plan regular workshops
- Jointly prepare proposals for funding
- Staff exchange
- Jointly undertake promotions for public relations purposes
- Establish effective networking
- Collaborate with national and international organizations

How may partnerships be sustained?

- Create management committee
- Incorporate program activities into existing budgets
- Regular program reviews
- Encourage sustained commitment
- Provide reward or recognition for staff
- Provide public relations benefits for partners

5. Innovation in mid-career extension training programs in francophone countries

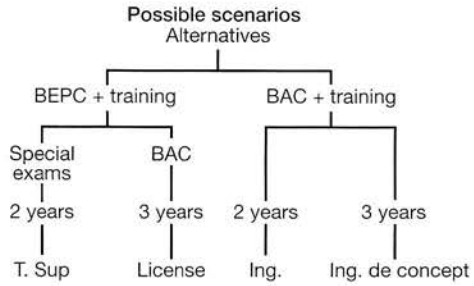
What is the new vision of extension?

- The extension agent as facilitator

What should be the approach?

- Identify community needs

- Determine the level of recruitment: BEPC plus training or BAC plus training
- Determine the duration of training: 2 years or 3 years



- Determine the nature of the degree: Superior technician/BEPC plus training, license/BEPC plus training, subject-matter engineer
- Extension staffing in four francophone countries:

	Level of training	*Extensionists, no.*
Burkina	BEPC + 2	1,800
Faso	BAC + 2	600
Mali	BEPC + 3	n.a.
	BEPC + 4	n.a.
Guinea	BEPC + 3	
	BAC + 3	1,300 (total)
Benin	CEPE + 4	n.a.
	BEPC + 4	n.a.
	BAC + 3	n.a.

Content of the curriculum

- Should develop competence in fundamental sciences, technical subjects, social subjects
- Should emphasize practical experience

How will we finance?

- Need to introduce external financing
- The government should provide recurrent expenses
- Students should have financial scholarships (e.g., from NGOs and private sector)
- The government (or employers) should pay salaries of students during time of training
- Find financial support for the SEPs from government and partners

Who should be in the partnership?

National

- Lead university
- Other universities
- NGOs
- Ministry of agriculture
- Private sector
- Farmers
- Ministry of education
- Ministry of finance
- Other ministries

International

- Lead universities
- Partner universities
- Technical and financial partners

Reflections on the Working Group Reports

Henk Knipscheer

I have gleaned four major themes from the reports of the five discussion groups: a shared vision, a common approach, the need to share costs, and the realization that there are benefits to be shared.

The background underlying the shared vision is the recognition that we face a rapidly shifting environment. Technologies, policies, and markets are changing fast. In a globalized economy, African maize farmers will have to compete with U.S. maize farmers, and African rice farmers with Asian rice farmers. At the same time we are experiencing an information technology revolution.

In this changing world, we cannot rely on individuals, be it extension or development agents or foreign experts, to be our main source of knowledge. The required skill is not to have the knowledge, but to be able to access the knowledge. Group 5 articulated it well with the statement that the new role of the extension or development agent is being a facilitator. Group 1 concurred with their statement: he or she should be a development "leader." Indeed, the training paradigm has shifted from training a message- and technology-oriented agent to an agent who can facilitate and initiate and who has leadership skills. The key question is, how do universities train their students for this new role?

The second theme concerns a common approach, which seems to have been accepted by all groups. I distinguish three main elements in this approach: the concept of life-long learning, the need for client-oriented training programs, and the concept of experiential learning.

Life-long learning refers to the need to upgrade yourself during your whole career. In a static society, you can assume that you train young people and equip them with the essential knowledge that will help them for a lifetime. In a dynamic, rapidly changing society, this concept is obsolete. One implication is the need to teach students the skill of learning by themselves and the art of learning from doing.

The second element refers to the sad reality that African universities turn out numerous graduates who have great difficulty finding employment. Regardless of the level of unemployment in a country,

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first-rate training should give graduates a substantial competitive edge in the job market. However, potential employers complain that many graduates lack needed skills. University staff should meet with potential employers and review the curriculum to ensure that training equips graduates with the skills that the society needs, and therefore is willing to pay for. That is what a client-oriented training means.

This brings me to the third element of the common approach—experiential training. We all know that we learn most from doing, and especially from doing something wrong. However, doing is not learning. The pastor in my church has preached sermons for 15 years, and I have the impression that he may not have learned much from all his doing. The key to learning by doing is to do things differently and to gain feedback from your doing.

The supervised enterprise projects (SEPs) are the experiential learning portion of the SAFE program. Group 3 focused on the question of how to organize and grade this new and most innovative component of the program. We know our goals: we hope that the best student in the SAFE program (e.g., the highest graded) will also turn out to be the best person in his job!

In our short experience with SEPs in Ghana and Ethiopia, we should ask if these students have really learned the right skills. It is my impression that teaching staff still overemphasize the technology aspects of the SEPs and do not sufficiently address the process-oriented skills such as the stimulation of farmers' participation, the conduct of participatory rapid appraisals, and community involvement. Feedback and evaluation of leadership skills seems completely lacking, and those are exactly the skills that Group 1 seems to emphasize. Last year I participated in a workshop on SEPs at Sokoine University of Agriculture where we identified essential skills such as listening, organizational, problem-solving skills; ability to access information; and cultural and political sensitivity. But we did not reach a conclusion on how to measure the students' progress in acquiring or honing these skills. Here I would like to suggest the use of self-evaluation by SEPs students, as one of the potential grading tools.

The third theme that I would like to address is cost sharing. Group 2 had the challenge of devising strategies for financing extension training programs. Unsurprisingly, the group focused on the financing of the mid-career training program. I thought that the distinction between start-up costs and the special financial needs for the SEPs was useful. It takes time and extra effort to form the national partnerships needed for a successful implementation of the program. And, once the program has started, the recurrent question on how SEPs should be financed remains to be addressed. Group 2 recommended that the employer, university, student, and SEP-hosting organization or community share these special expenses. It will be an exercise in problem-solving for students and academic staff.

The need to share costs brings us to the need to form partnerships. Group 4 distinguished the need to form partnerships both nationally and internationally. These partnerships are based on the recognition of mutual benefits. Employers such as a ministry of agriculture gain by improving their human resource base. The university gains by an increase in students and improved understanding of the working plan and the job market. The student gains by increasing his or her job skills and improving his or her career

potential. In case of the SAFE mid-career extension training program, the farmers ultimately gain by improved services.

Universities face a new, dynamic and demanding society. Institutions that are able to implement client-oriented, demand-driven programs for nontraditional students are more likely to survive the seemingly unceasing budget cuts. International partnerships help us to share lessons and experiences. Change is difficult: we need each others' help.

Implications of the Workshop for Country-Specific "SAFE" Programs

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Sasakawa Africa Association has been involved in agricultural development activities in several countries of sub-Saharan Africa for 13 years. The Sasakawa Africa Fund for Extension Education (SAFE) is one of its initiative aimed at fostering sustainable agricultural development in sub-Saharan Africa.

Before the launching of the first SAFE program at the University of Cape Coast in Ghana, we visited many African universities. It was clear that agricultural education and extension programs were grossly underfunded. Furthermore, extension courses were not a focus in most of the agricultural universities and colleges we visited. It was apparent that some action had to be taken to correct this imbalance even in the modest way that we are doing at the moment through the SAFE initiative.

When SAFE was conceived in 1991, the focus was to provide scholarships to experienced mid-career extension staff from selected African countries to pursue graduate degrees in Europe and the USA. This approach proved to be highly expensive, and we quickly learned that it would not have a significant multiplier effect. Therefore, the focus was shifted to strengthening the capacity of African universities and colleges to develop responsive extension training programs for mid-career extension staff. This approach is now enhancing the training of mid-career extension staff while at the same time strengthening the capacities of the participating universities and colleges. It also enables us to save needed funds for holding important international workshops such as this one.

Based on 6 years of experience with the SAFE initiative in Ghana, Ethiopia, Tanzania, and Uganda, as well as the discussions at this workshop, several issues are critical for starting country-specific SAFE programs:

1. Leadership is a major condition for starting and implementing any innovative program. Sustainable, innovative training programs usually have leaders who are focused on and committed to a clear goal. In the SAFE program, the goal is to develop responsive extension training programs for experienced mid-career extension staff in Africa and to enhance

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the capacity of selected African universities to develop demand-driven training programs. It should be emphasized that the pilot SAFE initiative in Ghana could not have succeeded if we did not have committed leaders (from Ministry of Food and Agriculture, University of Cape Coast, Sasakawa Africa Association, and Winrock International) with a clear vision. Clear vision and committed leadership made it possible for the pilot SAFE program to begin even when concerns were raised that the mid-career extension staff might not be able to meet the academic standards of the university.

2. The training program should be demand-driven—it should be based on the unique needs of the country. One country may need a diploma program, while another country may need a B.Sc. or other academic qualifications.

3. To lay a solid foundation for sustainability of the program, in-country institutional arrangements should be put into place right from the conceptualization of the training program to its implementation. The issues to address include the recruitment of the qualified and experienced academic staff required to nurture the program; funds to run the program, especially the off-campus SEPs component; flexibility on the part of the host university or college in designing a responsive curriculum without compromising its academic requirements; bringing on board other relevant partners, including individuals, government ministries and agencies, the private sector, and NGOs, that may be interested in the program.

4. The program should be an integral part of the programs of the college or university in which it is based. It should never be treated as a special program or a program parallel to existing programs.

5. The practical component of the program (SEPs) should never be compromised. The SEPs component is what is unique about the SAFE program. Without the SEPs, the program could be seen as little different from traditional training programs.

6. There is need to develop relevant post-graduation motivation strategies for the trainees (including appropriate job definitions, job placement, and salary) to enable them apply the knowledge and skills that they have acquired. The absence of post-graduation motivation strategy is one of the fundamental problems the SAFE program in Ghana is now encountering. A recent external evaluation pointed out that there is frustration among some graduates as shown by essential indicators of career satisfaction and motivation for pursuing higher education.

7. Each SAFE program should be "owned" by the country in which it is located. It is not, and should not be seen as, a program of Sasakawa Africa Association or Winrock International. Therefore, from the start, plans must be made for mobilization of internal financial resources or other support for the sustainability of the program. The stakeholders (i.e., government, university or college, and other partners) must bear the bulk of the cost of the operation of the program. SAA or other donor support should be seen as complementing the internal resources.

8. The program must establish formal partnerships with the private sector, NGOs, and bilateral agencies. These are potential sources of funding, especially for the off-campus SEPs.

9. A visit to existing SAFE programs (e.g., University of Cape Coast in Ghana and Alemaya University in Ethiopia) is a good starting point for those wishing to develop a SAFE-type extension training program. Such a visit will provide relevant information on lessons being

learned at those universities and how such programs could be adapted to a different context.

10. A local coalition of power actors should be built. A coalition of individuals and groups who are well positioned in the country could influence government officials and donor agencies to redirect some of their funds to the formal training programs for mid-career agricultural extension staff.

11. As part of the planning process for launching a new SAFE program, it is important to develop a framework for monitoring, evaluation, and documentation of the impact of the training program. The papers by Dr. Lindley and Prof. Carson stressed this point. This could include regular internal reviews of the program, consultations with diverse stakeholders, tracking of graduates, and external reviews of the program. Stakeholders need tangible information to judge the usefulness and impact of their investment. Stakeholders (including donors) are generally willing to provide technical and financial assistance for a training program if its impact can be clearly demonstrated.

12. Networks should be established with other institutions and agencies (both within the country and abroad) that are committed to training mid-career extension staff in Africa. Networks provide the means for sharing ideas on how best to implement and sustain innovative extension training programs. This workshop has been one the rare opportunities for representatives from several African universities and colleges to forge such a network.

These are some of the implications of the workshop that I have been able to identify, based on my experience with the SAFE program during the last 8 years. I sincerely hope that all of us will put into action the lessons learned here to improve our extension training programs and get agriculture moving in sub-Saharan Africa.

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