

Diagnosis of Postgraduate Training Needs in Agriculture and Food via Open and Distance Learning (PG-ODL) in Eastern and Southern Africa

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EXECUTIVE SUMMARY

Agriculture, including livestock, forestry and fisheries continue to be the foundation for development, hunger eradication, and poverty reduction for many countries in the developing world. Therefore, strengthening the capacity for agricultural research and analysis for improved policies, technologies, and institutions to achieve agricultural growth, food security, and sustainable natural resource management is essential.

Currently, there is a growing **Knowledge Economy Digital (KED) Divide** between developed and developing countries. However, in both developed and developing countries, the contemporary Open and Distance Learning (ODL) models show that there is value for ODL as an efficient, cost and time effective learning mode that could if globally expanded help bridge the 'KED' gap. For the less developed countries (LDC), ODL could strengthen capacity and support economic development by leveraging the power of information and communication technology (ICT) in provision of high-quality world-class education to a larger number of people. Among the anticipated deliverables is the incentive for students and professionals to obtain degrees in agriculture, food, and natural resources without leaving their jobs or home countries.

The Consultative Group for International Agriculture Research (CGIAR), with its human and physical assets, has a tremendous opportunity to establish a Global Open Food and Agriculture University that would effectively train students and professionals from developing countries via ODL. The most strategic entry point in this undertaking is to initiate programs at a postgraduate (PG) level, in particular, the Masters of Science (M.Sc.) degree. It is important to work at the M.Sc level because the M.Sc. capacity in East and Southern Africa still remains very low in proportion to the number of students who matriculate from the undergraduate level. Also, the current pool of M.Sc. graduates is insufficient for large doctoral (Ph.D.) programs.

As a mitigation measure (especially in the areas of farming, hunger, poverty, and natural resources), ODL offers opportunities for increasing the capacity of LDC postgraduates. However, many traditional LDC universities do not offer such programs. A Global Open Food and Agriculture University would be a way to address the LDC postgraduate capacity constraint. To ensure that the ODL needs are properly addressed, it is imperative that:

- The foundation for this initiative be relevant and responsive to LDC needs, and
- Existing possibilities for incorporating ODL into partner LDC traditional universities is identified.

A team of consultants was hired to assess the current needs for food and agricultural postgraduate distance education programs in Eastern and Southern Africa. The assignment comprised of a three-fold set of responsibilities and was carried out independently by the team members.

In Kenya, interviews were organized with key individuals familiar with higher education management in the field of agriculture, natural resources, and food security.. These were individuals believed to be best placed to discuss how a postgraduate ODL (PG-ODL) initiative could be developed as a tool for increasing regional capacity in agriculture and related fields.

In addition, an email partner expert (Ema-p) discussion was conducted with selected institutional *partners* involved in agriculture, natural resources, and food security in the region and beyond. During the email forum, the participants were asked several questions: whether or not they knew of any existing agricultural and food related ODL opportunities in their country, the extent to which ODL programs targeting researchers from NARS, universities, and the public/private sectors could benefit from CGIAR knowledge in food security in the context of a Global Open Food and Agriculture University initiative, what are the M.Sc. programs⁴ they *thought* that the CGIAR could develop through this initiative; and whether they have any reservations toward the Global Open Food and Agriculture University initiative.

The third and last assignment was a literature review of recent training needs assessment on postgraduate education in agriculture, natural resources, and food security in Africa. The findings from the review are pooled into this report

The conclusions from the needs assessment study are:

- Various CGIAR centers are offering specific training and capacity building options in accordance with their given mission mandates. Although there exists a range of high quality CGIAR products that could serve as potential ODL ingredients for integration into the existing Traditional Face-to-Face Formal Education (TUFLE) Mode; many of which are piecemeal modules (e.g. Manuals and CDs), they have not yet found their way into university syllabi or curricula. The existing modules presume the need rather than address the need.

Based on what the key persons interviewed said, it is observed that:

- There exists a strong national expectation for ODL to succeed as a parallel mode of education.
- The Global Open Food and Agriculture University (although sketchy in the minds of many people who do not know the CGIAR) is seen to be associated with some relevance to LDC capacity needs. There were strong expressions that this CGIAR intervention should not be mistaken by African universities as a plan by the Global Open Food and Agriculture University to play the “big brother to the helpless little brother.” Such an impression would seriously weaken the foundation for the CGIAR-led initiative.

⁴Potential GO-AFU 12-indicator postgraduate programmes that were not revealed to the Ema-p include: Research management, Seed Technology & policies, Agric. & applied Econ, Natural Res. Mgt, Forestry Mgt, Food Security & Nutr, Livestock Mgt, Biodiversity & Germplasm Mgt, Water Res. Planning & Mgt, Crop Protection & Pest Mgt.

- The possibilities of how and/or whether the partner traditional universities are positioned to incorporate ODL into their programs must be carefully and strategically worked into the initial grand plan. This will require a mobilization of official university protocol as much as possible throughout the planning process.
- The affected parties in connection with this initiative have interests, attitudes, practices, and obligations that are too diverse to take for granted. In retrospect, therefore, a comprehensive needs assessment methodology and a coverage strategy is required.

In conclusion, this assessment reveals that the conditions are right for positive progress toward the realization of the Global Open Food and Agriculture University. It must, however, be a creation of many (old and new) faces all in one.

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PART I

INTRODUCTION

BACKGROUND INFORMATION

Distance education is formal instruction conducted at a distance by a teacher who plans, guides, and evaluates the learning process. Nearly every country in the world makes use of distance education programs. In the United States, communication satellites distribute educational programming to public television stations, which are either broadcasted or viewed on closed-circuit systems. India has also experimented with satellites to broadcast educational materials. In England, the Open University provides college education by using radio, television, and regional learning centres. Other nations that have used audiovisual devices to transmit educational materials over large distances are France, Canada, and Brazil.

Distance education increasingly uses combinations of different communication technologies to enhance the abilities of teachers and students to communicate with each other. These programs enable learners and teachers to interact with each other by such means as computers, artificial satellites, telephones, radio or television broadcasting, or other technologies. A learning process combining both sound (audio) and vision (video) is known as audiovisual education.

Audiovisual education emerged as a discipline in the 1920s, when film technology was developing rapidly. A visual instruction movement arose, which encouraged the use of visual materials to make abstract ideas more concrete to students. As sound technology improved, the movement became known as audiovisual instruction. Educators at that time viewed audiovisuals only as aids to teachers. Not until World War II, when the armed services used audiovisual materials to train large numbers of persons in short periods of time, did the potential of these devices as primary sources of instruction become apparent.

In the 1950s and 1960s, developments in communications theory and systems concepts led to studies of the educational process, its elements, and their interrelationships. Among these elements are the teacher, teaching methods, information conveyed, materials used, the student, and the student's responses. As a result of these studies, the field of audiovisuals shifted its emphasis from devices and materials to the examination of the teaching-learning process. The field was now known as audiovisual communications and educational technology, and audiovisual materials were viewed as an integral part of the educational system.

Studies in the psychology of learning suggest that the use of audiovisuals in education has several advantages. First, learning is based on perception, which is the process by which the senses gain information from the environment. The higher processes of memory and concept formation cannot occur without prior perception. Since, people can attend only to a limited amount of information at a time; their selection and perception of information is influenced by past experiences. Researchers have found that, other conditions being equal, more learning occurs when information is received simultaneously in two modalities (for example vision and hearing) rather than in a single modality. Furthermore, learning is enhanced when material is organized and that organization is evident to the student. These findings suggest the value of audiovisuals in the educational

process since they can facilitate perception of the most important features, be carefully organized, and requires the student to use more than one modality.

The American psychologist B. F. Skinner was influenced by these advantages when he developed his teaching machines in the 1950s. Skinner's work emphasized the role of audiovisuals in facilitating individualized learning in the context of a total educational plan. The process involved identifying objectives; arranging subject matter into logical sequences; preparing and testing instructional programs; and then implementing, testing, and revising them. Skinner shifted the emphasis in education away from the teacher's presentation of information and towards the learner's behavior and, especially, reinforcement of that behaviour. His teaching machines provided programmed instruction, which allowed students to proceed through lessons by small steps, at their own pace, following an orderly sequence, and receiving immediate reinforcement for every correct response.

With the spread of computer-network communications in the 1980s and 1990s, large numbers of people gained access to computers linked to telephone lines allowing teachers and students to communicate in conferences via computers. The e-communication technologies have since become more efficient and more widely available, thus increasing the number of elementary schools, secondary schools, universities, and businesses offering distance education programs.

To date, distance education is making use of computer conferencing on the World Wide Web, where teachers and students present text, pictures, audio, and occasionally video. A conferencing method is known as one-way or two-way video. It uses television pictures that are transmitted to particular sites, where people can reply to the broadcasters with a telephone call-in system. Television pictures can also be transmitted in two directions simultaneously through telephone lines, so that teachers and students in one place can see and hear teachers and students in other places. This is called video-conferencing.

Each medium of communication carries certain advantages over the other. The most effective distance education employs several telecommunications media linked together so that learners can benefit from the strengths of each one. For example, a student may watch an instructor's lecture on a video monitor, respond with questions through electronic mail, and participate in class discussions through telephone audio-conferencing.

Distance education programs require teams of media producers, teaching specialists, and experts in academic subjects to design effective teaching strategies. Other specialists plan and facilitate communications with learners. Because such programs can be expensive to produce, institutions usually design distance education courses for relatively large audiences and wide geographic areas.

HISTORY OF DISTANCE EDUCATION IN THE WEST

Distance education traces its origins to mid-19th century Europe and the United States. The pioneers of distance education used the best technology of their day, the postal system, to open educational opportunities to people who wanted to learn but were not able to attend conventional schools. People who most benefited from such correspondence education included those with physical disabilities, women who were not allowed to enrol in educational institutions open only to men, people who had jobs during normal school hours, and those who lived in remote regions where schools did not exist.

The invention of educational radio in the 1920s and the advent of television in the 1940s created important new forms of communication for use in distance education.

Educators used these new technologies to broadcast educational programs to millions of learners, thus extending learning opportunities beyond the walls of conventional teaching institutions.

The development of reliable long-distance telephone systems in the early 1900s also increased the capacity of distance educators to reach new student populations. But telephone systems never played a prominent role in education until the introduction of teleconferencing technologies in the 1980s and 1990s. Teleconferencing systems made it possible for teachers to talk with, hear, and see their students in real time—that is, with no delays in the transmissions—even if they were located across the country or around the world.

PRESENT SITUATION OF DISTANCE EDUCATION

More than 20 other countries have national open universities in which *all* instruction is provided by distance education methods. This method of education can be especially valuable in developing countries. By reaching a large number of students with relatively few teachers, it provides a cost-effective way of using limited academic resources. Many businesses use distance education programs to train employees or to help them update skills or knowledge. Employees may take such programs in the workplace or at home in their spare time.

In Britain, the process of creating the “University of the Air” was first proposed by former British Prime Minister Harold Wilson in 1963. Wilson and others interested in the project advocated the use of television and radio for limited teaching purposes, a method already carried out in the United States and the Union of Soviet Socialist Republics (USSR). By the time the university opened for classes in 1971, administrators had significantly broadened the scope of the university to facilitate independent learning for large numbers of students. Britain’s nationally supported Open University, based in Milton Keynes, England, has one of the best-known programs. The institution possesses the largest student body of any higher education and training institution in the United Kingdom. A vast majority of the school’s 133,000 students receive instruction entirely at a distance.

The Open Learning Institution (OLI) is open to any person over age 18 living in Britain or another member nation of the European Union, regardless of previous education. Established in 1969, the school conducts teaching and research through radio and television programs, mailed course materials, and the use of computer facilities. The OLI confers bachelors, masters, and doctoral degrees, but the school has no requirements to follow any particular course of study. However, it does require specific levels of academic achievement for admission to postgraduate programs. The university offers programs in the arts, mathematics and computing, science and technology, social science, education, health and social welfare, business, and humanities. Most students are between 25 and 45 years of age. Roughly three-quarters of the students work full-time while they pursue their studies.

Instruction at the OLI often makes use of special equipment to conduct science and technology experiments at home, audio and videocassettes, and computer software. Many lectures are conducted through television programs on the national British Broadcasting Corporation (BBC) networks. Some courses are taught via the Internet, while others make use of the Internet as one component of instruction. Some courses include a one-week instruction in residential schools, usually offered during the summer.

In the United States, institutions of higher education, business, and the armed services all use distance education methods. Students have enrolled in television courses

produced by certain colleges and universities around the country. The Public Broadcasting Service (PBS) delivers these courses to students at over 2000 institutions. A growing number of private businesses, including multinational corporations, operate satellite television networks to deliver vocational training to employees throughout the world. The United States Army offers distance education programs to military personnel stationed in different parts of the country. These programs are conducted by the Army Logistics Management College, based in Fort Lee, Virginia, and delivered over the Internet and in one-way video/two-way audio systems to over 70 locations. The United States Air Force also offers distance education programs through the Air Technology Network (ATN), a division of the Air Force Institute of Technology. The ATN uses one-way video/two way audio telecommunications systems to reach students at every Air Force base in the continental United States.

Distance education offered through colleges and universities in the United States provides instruction in a wide range of academic and vocational subjects. The National University Teleconference Network (NUTN) is a consortium of approximately 260 colleges and universities that offer distance education programs in most fields of knowledge. The National Technological University (NTU), based in Fort Collins, Colorado, offers hundreds of courses taught by faculty at dozens of major universities. The Agricultural Satellite Corporation provides courses on agricultural topics to many colleges and universities. HealthNet, an institution operated by Boston University Medical School, carries continuing education courses for health care professionals. The Black College Satellite Network (BCSN) broadcasts, primarily from Howard University, programs aimed at colleges around the country.

A number of institutions offer complete college degree programs via computer conferencing. The Online Campus of the New York Institute of Technology offers bachelor's degrees in science. A distance education program called Connect Ed offers a Masters degree in Technology and Society in conjunction with the New School for Social Research in New York City. The University of Phoenix offers computer-based courses leading to degrees in business and management. The Open University in Britain offers a Masters degree in the field of distance education to anyone in the world who can access the Internet.

Open Distance education is an established mode of modern instruction. In developed countries it has a highly evolved history and today it fits within the contemporary times.

Current Educational Status in Eastern Africa

Agricultural education in the region

Kenya and Tanzania

1968 to 1980: This time period was the expansion for agricultural education and training at all levels. The expansion was based on the belief that it would lead to increased self-employment opportunities for young school graduates and that a high-level technical workforce in the agricultural sector would expand public service and replace expatriates. Subsequently, the University of Nairobi began teaching professional agricultural education at a degree level in 1970/71; Egerton in 1986; Jomo Kenyatta University of Agriculture and Technology (JKUAT) in 1994, Maseno University in 1997 and Moi University; the latter is now a Faculty which had been moved from the University of Nairobi's Faculty of Agriculture. Moi University introduced horticulture in 1998/99.

Beside the Global Open Food and Agriculture University initiative, the talk in town of open learning is in the air in Kenya. During the 31st Congregation for the Conferment of degrees and award of Diplomas in May 2004, the Minister for Education, Professor Saitoti, announced that Kenya was soon to come up with a policy on open learning.

In Kenya, some quarters that we talked to argue that excessive appetite for public goods and services seems to rise with promises of free things and unfortunately at the expense of quality. In effect, even for ODL, the euphoria of open learning in general could probably end up being just one of "those things that come to pass." Others, who like to hold suspect political will, contend that only ODL programs externally designed without weak local inputs can survive.

One appreciates that Kenyan methods of admission for prospective applicants to the university have sometimes been too stringent and lack of flexibility in admitting poorly prepared students. Indeed, admission criteria have always been based on a hypothetical qualified student meeting the stringent admission requirements as set out by various discipline-specific standards; but not all of these methods generally match the needs and abilities of the larger public who aspire for university education. For example, people from critical sectors of the economy (such as agriculture and food) with potential to impact their countries' development. Many of these individuals wished that they were given opportunities to attend university and are feeling left out of the system.

We talked to an interesting group of students, who are currently enrolled in degree programs. One student quipped that he has undergone the traditional rigor of preparing for regular university examinations under a classroom. As a result, he is able to identify with his previous college a lot more intimately than if he had simply been a 'guest' student through a remote (long distance learning) connection.

In Tanzania, the Ministry of Agriculture Training Institutes (MATIs) and Livestock training institutes (LITIs) rose from 7 at independence to 14 and 16 by 1975 and 1994, respectively. This also was in a bid to increase the availability of technical human resources, particularly at certificate and diploma levels. Expansion of agricultural education at the university level in Tanzania has been small. The Faculty of Agriculture was established at Morogoro (Tanzania) in 1971 as an affiliate of the University of Dar es Salaam and later elevated to what today is known as Sokoine University of Agriculture.

Courses in forestry were introduced in 1973 and in veterinary science in 1976. Undergraduate enrolment remained modest at 114 people during that period but had risen to 378 people per year by 1998 and is expected to stabilize at 400 people per year by 2005.

The introduction and expansion of agricultural education in the Tanzania system did not have the expected positive impact on agricultural production, largely because allocation of resources to agriculture was low and policy governing MATIs and LITIs changed frequently. Nationalization of major means of production also caused uncertainties.

Another defect in the curriculum was that it trained the graduates for formal employment in the public sector and not for self-employment as farmers. It was also believed that introducing agriculture in schools would change students' attitudes in favor of agriculture and farming in general. However, in both countries (Kenya and Tanzania) over and above weaknesses in the delivery and support of the curriculum, there was no mechanism to monitor and evaluate the curriculum and its impact on attitudes, particularly with respect to school-leavers taking up gainful employment in farming. Furthermore, the

increased enrolment in agricultural institutes, colleges, and universities resulted in an oversupply of poor-quality graduates to a stagnating economy, which led to high rates of unemployment. This in turn lowered the incentives for students to major in agriculture related fields. The rapid expansion plan for agricultural education generally lacked a clear policy or coordination, leading to wasteful duplication of programs. As government funding for farmers' education decreased, the few courses offered became increasingly more traditional and largely irrelevant to farmers' situations. Thus, underfunded Farmer Training Centres (FTCs) were no longer adequate sources of information for farmers. This story points out an area where PG-ODL may be valuable.

Technical Report No. 25 on Agricultural Education in Kenya and Tanzania from 1968 to 1998 was published in 2002 by the Regional Land Management Unit (RELMA-Africa). The findings from this report are summarized below:

a) Between 1960 and 1970

The improved agricultural production ensured food security in Kenya for most of this period possibly due to impact of agricultural education in the first 10 years after independence resulting from:

- Curricula that focused on farmers' problems
- Resource support of agricultural education by government in partnership with the private sector (such as seed and agricultural chemical companies and foreign donors)
- Government investment in the agricultural sector (infrastructure such as roads, working extension network, and markets)

b) Between 1975 to early 1980s:

This period witnessed increasing problems in agricultural education mainly due to poor resources allocation. Donor supports were declined and the government could not provide the necessary resources to cover the escalating enrollment costs. This led to deteriorating quality of training programs, increased student-to-faculty ratio, low quality of instruction, and below-standard student thesis research supervision. Curricula at all levels became more theoretical with few practicals, experiments, and field trips.

According to a recent personal interview held with Professor Ngugi, it came out that the first opportunity for ODL to make an immediate impact would be in the training of agricultural extension personnel. In Kenya, for instance, the introduction of land resettlement schemes in pre-independence large-scale farming areas increased the demand for qualified extension workers who could train newly settled African farmers in modern farming methods. Tanzania also faced a post-independence shortage of trained agricultural extension workers. It is true that there was a time when extension literary died in the region, however frantic efforts are now being made to revive it.

The introduction of cash crops and other cash generating enterprises such as dairying and horticulture expanded a commercial interest in the Kenyan farming sector. Thus, educated farmers with large business operations may be interested in pursuing a PG-ODL in agribusiness production and management. The fact that universities are now offering diploma and certificate level courses targeting the workforce is itself a huge opening for ODL.

From other sources (Musisi, N.B and Muwanga, N.K., 2001; and literature of "Innovations at Makerere Committee" shortened to "I@mak.com")

Uganda

As a result of inadequate capacity following World War 1 Makerere Technical School was established in Uganda in 1922 by the American Phelps-Stokes Commission to handle the

Stimulated by the grossly inadequate educational policies of missions and the then colonial government and the post-World War I need for a middle cadre of civil servants beyond clerks, messengers and interpreters,. From carpentry, mechanics, and building, the curriculum expanded to include science, preclinical medicine, engineering, and agriculture. Makerere's early graduates easily found jobs in missions or in the administration of the Kabaka, the traditional ruler of Buganda. In 1937, the school was expanded into a Higher College for East Africa, awarding diplomas and certificates. It took the status of a university college in 1949, for the entire East Africa region and to award external degrees for the University of London. In 1963 until July 1970 (after Uganda's independence) Makerere University joined with universities in Kenya and Tanzania to form the University of East Africa. During that period, Makerere University turned out noted professionals and leaders for all of East Africa and achieved an international reputation as a first-class institution.

In the late 1970s and 1980s, Makerere University's financial resources from both public and external sources declined dramatically. Among other factors that caused the decline were arguments that public investment in universities and colleges brought only meagre returns compared to those for primary and secondary education and higher education, in fact, only magnified inequalities. Government in effect cut down tertiary-level funding while donor support declined as well. This decline came at a time when Makerere University was experiencing increasing pressure to expand enrollment. It responded by admitting more students, but with limited resources per student. The most obvious effect of the financial decline in the 1970s and 1980s was a sharp deterioration in the quality of teaching and learning. Makerere University became a place of bare laboratories, empty library shelves, chronic shortages of scholastic materials, and overcrowded residence halls. Libraries, common rooms, and toilets and washroom facilities were converted into additional student rooms, leaving students to make their own alternative toilet arrangements.

In the area of ICT, there was virtually no application of information technology to either teaching and learning or institutional management during this period. Students remained without exposure to advances in ICT. There was also little time for seminars, tutorials, or one-to-one contact, let alone intellectual reports.

By the Mid-1980s, a few research programs came to life with sporadic external funds notably to the faculties of veterinary, social sciences, agriculture, and forestry. However, these funds were for specific projects in areas related to donor's interest, with little scope to improve the research capacity of Makerere University. Thus, departments that received donor funding prospered while others suffered.

The factors that previously affected the state of universities' formal education in Eastern and Southern Africa, such as funding problems poor management, and academic inertia still exist today. Postgraduate student research is still restricted to donor funding where available and often meagre or no resources is invested into research programs by the government. Thus, it is important to note that governance issues can also affect budget appropriation to education.

A global initiative in open distance learning will be very beneficial. It can be used as a tool for change in restructuring individual institutions.

Universities in the region would rise very rapidly above the remorse of inertia if the countries and their respective universities embrace the I@Mak.com model as one excellent initiative capable of rapidly adsorbing global initiatives such as GO-AFU. Because of this initiative, in the words of the Vice Chancellor (I@mak.com Bulletin, Dec. 2001):

...there is an emerging dramatic change in admission policy, income generation from private fee paying students, introduction of new degrees, consultancy firms, commercial units, curriculum development and decentralization of academic matters... (going on at Makerere University in Uganda)....

...These are against the national and broader transformations of liberalization, privatization and decentralization...

The highlights of this Capacity Building initiative are worth stating here:

- i. This is the first time the government of Uganda and the University have extensively planned together for higher education
- ii. I@mak.com is based on primary research carried out on the “demand side” for Human resources from the perspective of the District
- iii. Implementation is based on systemic support to the university
- iv. The decisionmaking mechanism included creation of a committee of seven members from (Deans and Directors) Makerere, seven from government, and two international consultants. The committee has now been expanded to include the university bursar (to ensure financial discipline) and the academic Registrar
- v. Funds are available to each and every “unit” (consisting of departments, institutes, schools, and faculties) on a competitive basis
- vi. Transparency, accountability, and competition are harnessed to promote innovation, and eventually, sustainability of the transformation. The primary outcomes will be to enhance the human capital currently managing decentralized government units, improved graduates from Makerere, capacity development within Makerere, greatly expanded research, and enhanced policy capacity all with a primary focus on decentralization.

Professor Miriam Were, a Kenyan and an external member of the I@MAK.Com, identifies four features worth noting as a healthy ground for which ideas like agricultural ODL can germinate on despite the “hard seeded ground” that higher education finds itself upon in much of Eastern and Southern Africa:

- a) The Vice Chancellor of Makerere sits in I@Mak.com meetings, oversees projects implementation, and ensures compliance to guidelines. He is also responsible for membership.
- b) There is a true partnership between the university and the government. They agree on general directions and collaborate to get many activities completed.

- c) Makerere University is truly mobilizable as evidenced by total staff response to the I@Mak.Com of which the Vice Chancellor ensured that it was included in the University Strategic Plan
- d) Both government and Makerere University have managed to establish such high levels of international confidence with donor community. In effect, large sums of money from bilateral agencies and international NGOs in support of programs is flowing in at the level of Vice Chancellor, Faculty Deans, and Directors of Institutes.

It is hoped that individual institutions in respective countries are doing something so that initiatives such as GO-AFU that add value to university programming can be launched. Where, in mean time, should the CGIAR Centers be strategically positioning themselves for the final launch?

OPPORTUNITIES IN DISTANCE EDUCATION

Distance education has created a major shift in how educators and students think about teaching and learning. By allowing students to learn in more convenient locations and often at more convenient times, distance education opens educational opportunity to previously unreached populations. It also enables more people to extend the period of their education from a limited number of schooling years to a lifelong learning process. In addition, it changes power and authority relationships between teachers and learners, often encouraging more equal and open communication than in conventional educational settings. Because distance education enables institutions to reach students all over the world, learners gain increased opportunities to experience other cultures while enriching their educational experience.

The United States and other countries have begun to take advantage of the ability of audiovisual devices to transcend geographical barriers. Audiovisual devices can expose students to experiences beyond the classroom and they can disseminate instruction across large areas, making education accessible to more people.

As the technology improves, educational capabilities increase correspondingly. The emergence of inexpensive computer technology and mass storage media, including optical videodiscs and compact disks has given instructional technologists better tools with which to work. Compact disks (the CD-ROM and CD-I) are used to store large amounts of data, such as encyclopaedias or motion pictures. At new interactive delivery stations with computers and CD-ROM, CD-I, or videodiscs, a student who is interested in a particular topic can first view an electronic encyclopaedia, then watch a film on the subject or look at related topics at the touch of a button. These learning stations combine the advantages of reference materials, still pictures, motion pictures, television, and computer-aided instruction. With even newer technologies now being developed such learning stations will eventually be commonplace in homes for both entertainment and educational purposes.



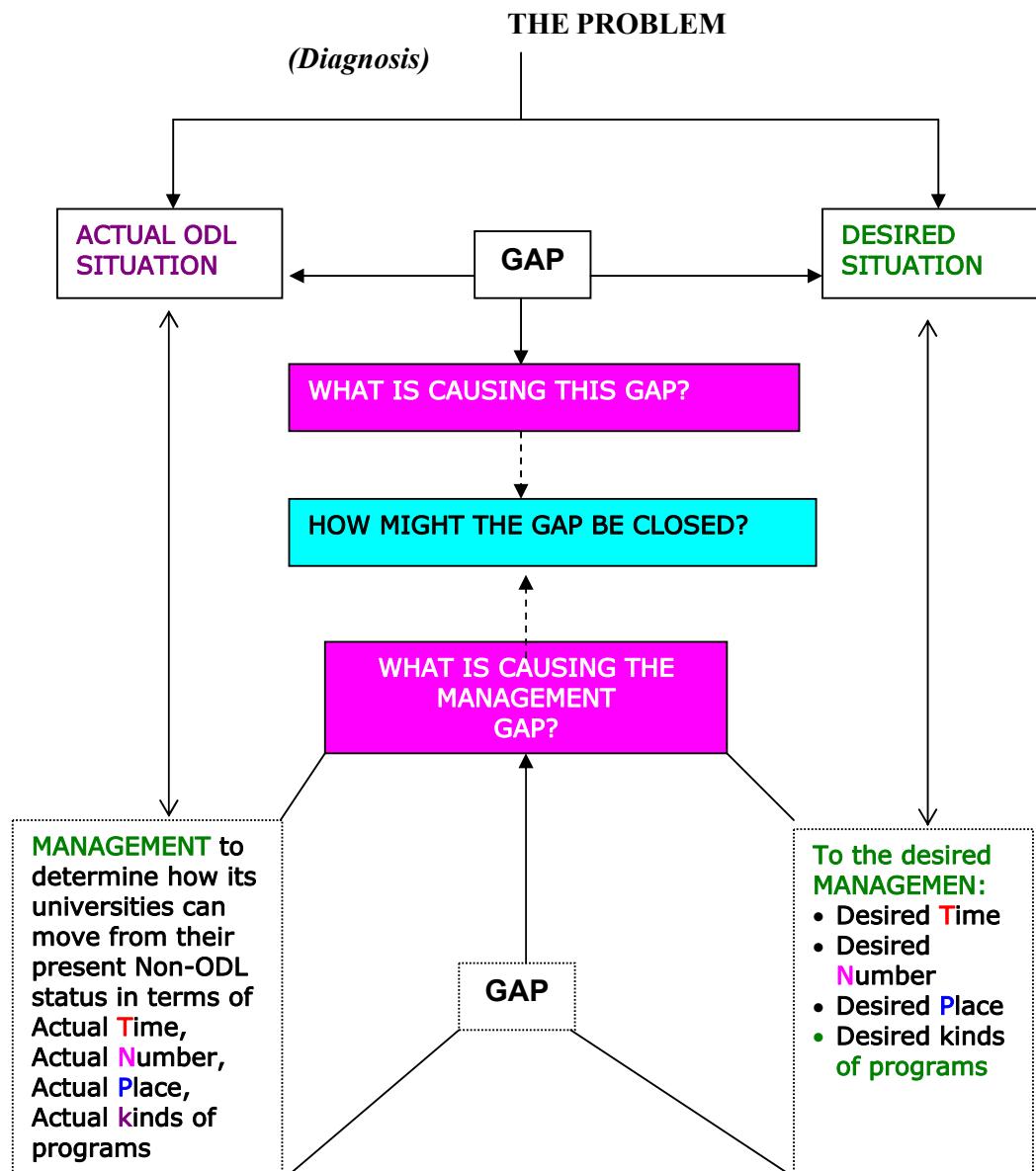
PART II

METHODS FOR ASSESSING NEEDS

Currently, the developing countries are experiencing a significant capacity constraint despite the Tertiary Education Formal Classroom (TEFC) programs in respective national universities. It is observed that this gap between *capacity* and *need* must be addressed if the advances made thus far in agriculture-led poverty reduction in the developing world are to continue, and if chronic and transitory food insecurities is to be eradicated in the region.

The Consultative Group for International Agriculture Research (CGIAR) system, with its human and physical assets, has a tremendous opportunity to establish a Global Open Agriculture and Food University (GO-AFU). This program is seen as a means that could effectively improve the skills of developing country students and professionals but it requires that proper assessment is made. The gaps include both the ODL as an *issue* and the stakeholder administrative and operative *management* structures as the other (Figure 1).

FIGURE 1: The self evaluation and needs assessment framework



In the GO-AFU context, distance education is being looked at as a cost- and time-effective way to strengthen capacity by way of linking potential students' training prospects in-country to high-quality teaching, and could offer an incentive for students and professionals to obtain degrees while working in their own countries. The fact that this is already not happening means that a *gap* exists between what is and what should be.

A gap analysis is often undertaken through a needs assessment approach. Generally, a needs assessment framework is fairly global in its concept form. It is carried out especially when there is lack of recent information to provide data that can be used to make a particular undertaking high quality, efficient and most of all, relevant.

In operational terms, needs assessment can be defined as a considered condition in which there is a difference between "what is" and "what should be".

The Problem being addressed

Postgraduate open distance learning (ODL) in agriculture and food in Eastern and Southern Africa is an emerging prospect that must penetrate the academic traditions; some, which may have to be changed to accommodate its inclusion. The problem lies not in the ODL itself, but in the change agent(s) have to:

- Identify the GAP;
- Define selves (i.e. change agents as who? – identity/authority analysis); and
- Undertake internal self-evaluation so as to make the process of ODL accommodation into the current academic programming better.

Identifying the gap (gap analysis) may in a way be helped by a **Game Theory** context; defined as a mathematical analysis of any situation involving a conflict of interest, with the intent of indicating the optimal choices that, under given conditions, will lead to a desired outcome. Although game theory has roots in the study of such well-known amusements as checkers, ticktacktoe, and poker—hence the name—it also involves much more *serious conflicts* of interest arising in such fields as sociology, economics, and political and military science.⁵

Authority analysis can further be contextualized in terms of Arrow's theorem that shows that democratic decisionmaking rules will allocate resources in a manner that is less than optimal. Arrow (1921-), American economist and Nobel laureate, won praise for his analysis of decentralized decisions in societies where a *central authority* fixes prices. Arrow also applied his complex theoretical insights to social concerns such as medical care, education, water resources, and racial discrimination.⁶

⁵"Game Theory," *Microsoft® Encarta® Encyclopedia 2000*. © 1993-1999 Microsoft Corporation. All rights reserved.

⁶"Arrow, Kenneth J.," *Microsoft® Encarta® Encyclopedia 2000*. © 1993-1999 Microsoft Corporation. All rights reserved.

Self-evaluation (game theory-contextualized) could lead to problem identification. Further evaluation of problem connected to self will tell you your position in time and space (the actual situation at hand that could be. When further assessed, a given situation may manifest the existence of some gap(s) between its actual standing *visa avis* a more desirable one (See Figure 1).

This may be a useful part preceding the planning for needs assessment. For proper diagnosis, a consultant collects ‘signs of a possible ailment’, draws up a diagnosis as a likely problem, and may then proceed with certain specific tests to confirm to build the case so that proper treatment regime(s) can be designed. The purpose for which ‘signs’ were collected in this exercise is guided by the above rationale.

Looking for Signs

Quoting a Ugandan Draft Strategy Paper titled: “African University Initiative: Riding the Wave of Reform (February 28, 2002)” reads:

There is now abundant evidence to suggest that after two decades of stagnation and lost vision, universities in Africa are demonstrating new commitment to reform and correspondingly enhanced potential for contributing to national development. The conditions encouraging this spirit of renewal and resurgence are institutional, national and global. Universities themselves are showing realism and radicalism in their willingness to break with outmoded traditions and embark on major institutional and academic change, including new financing formulas, course structures and governance practices. African governments increasingly recognize the value of these reforms for poverty alleviation through economic growth, redistribution and empowerment, and for achieving quality at all levels of the education system.....Among global factors helping to transform the scope of university practice and performance is the revolution on information and communication technology (ICT)... (as) ...one of the most powerful...

PART III

REVIEW OF EXISTING TRAINING NEEDS ASSESSMENTS

Dr. Geoffrey M Muluvi undertook an assessment of the stock of recent training needs assessments (TNAs) conducted by CGIAR centers and similar research organizations on postgraduate education in agriculture, natural resources, and food security in Africa. Its two objectives were:

1. To take stock of recent TNA's on postgraduate education in agriculture, natural resources, and food security in Africa
2. To prepare a comprehensive synthesis of their findings and suggest a way forward.

METHOD USED

To learn about existing TNAs, the consultant visit selected institutions and organizations in Nairobi to interview staff members and to obtain the TNA documents (Table 1).

Table 1: Institutions and organizations visited for existing TNAs

Date of visit	Institution/organization ⁷	Type of institution/organization
March 27, 2004	AICAD	Regional
June 9, 2004	ANAFE	Regional
June 9, 2004	ICRAF	CGIAR
June 21, 2004	ICIPE	International
July 6, 2004	ILRI	CGIAR
July 6, 2004	ISAAA	International
July 8, 2004	AAS	Regional
July 30, 2004	IPGRI	CGIAR
August 6, 2004	ICRISAT	CGIAR

RESULTS

Three of the nine institutions and organizations surveyed have conducted a training needs assessment in certain aspects of postgraduate training in agriculture, natural resources, or food security in Africa. The institutions that had previously and recently carried out training needs assessment in postgraduate training were IPGRI, ANAFE, and ICRAF.

In the year 2000, IPGRI engaged a consultant to gather information in terms of the capacities, core functions, and models used to link institutions within and among themselves in East Africa. The data collected was primarily relevant to plant genetic resources (PGR). The consultant surveyed designated universities, institutes, and organizations in Ethiopia, Kenya, and Uganda.

In 1999-2000, the African Network for Agroforestry Education (ANAFE) initiated a study to visit sixty-five education institutions (twenty-eight colleges and thirty-seven universities) in East, Central, and Southern Africa to understand current and future training needs in agroforestry and natural resources management in East, Central, and Southern Africa. These institutions included the African Network for Agroforestry Education (ANAFE) members and non-member institutions that teach agriculture, forestry, natural resources management, and research and extension. The status of agroforestry education and training was investigated through a survey with emphasis on the state of teaching and training facilities, the existing linkages to research and extension institutions, and the number of staff teaching agroforestry-

⁷ILRI: International Livestock Research Center; IPGRI: International Plant Genetic Resources Institute; ICRISAT: International Research Institute of Semi-Arid Areas of the Tropics; ICIPE: International Centre of Insect Physiology and Physiology; ANAFE: African Network for Agroforestry Education; ICRAF: International Center for Research on Agroforestry; AICAD: African Institute of Capacity in Agricultural Development; AAS: African Academy of Science;

related courses. In addition, the institutional needs in agroforestry education and training were also considered.

Subsequently, ICRAF in 2003 carried out an exploration in Kenya, Tanzania, and Uganda to assess the practicability and demand of offering electronic learning (E-learning) courses to partner institutions such as universities on E-learning training needs.

IPGRI's Training Needs Assessment in Plant Genetic Resources

The TNA revealed that there was a shortage of modern laboratory and field equipment including vehicles for transportation among many of the institutions surveyed. In some instances, herbarium facilities for PGR were either lacking or in bad condition. There was a greater emphasis on the more contemporary science other than coverage of traditional subjects such as taxonomy, morphology, phenology, and herbarium collection.

It was found imperative to include in the agriculture and horticulture curricula, a strong focus on closer relatives of domesticated plants. It was recommended that PGR training must encompass aspects of wild herbal trees traditionally used in herbal medicine and important tree species with industrial promise.

The consultant found that there were enough facilities for respective institutions and individual countries to enable them to offer a full-fledged postgraduate training on their own. Costs were found to be high for specialized libraries, good laboratory facilities, adequate funding for research, and good computer services. A few laboratories were found well equipped enough for postgraduate teaching; however, it was recommended that a means should be found to pool inter- and intra-institutional resources in order to provide training at different levels and for the development of a complete PGR curricula in agriculture, horticulture and forestry.

Training Needs Assessment in Agroforestry by the ICRAF based ANAFE

Ninety percent (all ANAFE member institutions) of the institutions studied had or was in the process of incorporating agroforestry into their curricula as part of a course, a separate course, or a full programme. Programs on natural resources and social forestry included M.Sc. Degrees at Kenyatta University in Kenya, Makerere University in Uganda, Juba University in Sudan, and Bunda College in Malawi. It was observed that agroforestry was increasingly being used as an entry point into programs in biodiversity, environment, and conventional natural sciences in all ANAFE member institutions.

The major agroforestry education and training needs identified were:

1. Developing human resources to deliver agroforestry training and education
2. Establishing an agroforestry outdoor teaching facilities
3. Developing relevant teaching materials and curricula
4. Strengthening collaboration and networking among institutions
5. Strengthening education-research extension linkages
6. Strengthening the agroforestry research system
7. Acquiring current agroforestry books and publications
8. Improving library and laboratory facilities

ICRAF's Training Needs Assessment in E-learning

The TNA was carried out with a view to assess the potential to advance Agroforestry education by E-learning within the interconnectivity backbone prevailing within the regional agroforestry Training networks in Africa and the likely E-role ICRAF could play.

This assessment identified connectivity as a major problem affecting E-learning training in Sub-Saharan Africa blamed on the following:

1. National networks are often unstable and frequently slow or shut down, citywide or countrywide.
2. Some locations use both satellite and landline connections at the same time, one or both of which can clog or collapse.
3. Most of the universities in the region have wired their own campuses with local area networks.
4. Computers are rarely available to students for general use except those taking computer-based courses.
5. Most of the machines available in computer labs were either few, old, and/ or ill maintained.
6. Local university libraries do not stock the journals and books that students need for their research.

Other issues with regards to e-learning in agroforestry are:

1. The applicability of e-learning in agroforestry especially how it will be designed, accredited, and integrated with the existing curricula.
2. Transferability of courses between universities does not exist.
3. Online agroforestry training courses or modules were seen as potential supplemental learning activities.
4. Difficulty in developing e-learning courses for use at multiple universities due to Learning Management Systems (LMS's).
5. There is high enthusiasm for e-learning and Internet as a research tool. However, e-learning should not be offered by a third party institution, but for this third party institution to provide curriculum-development support to universities who wish to develop such courses within their own academic and technical framework.

The report identified major training needs in e-learning as follows:

1. Provision/ Acquisition of a large quantity of fast computers.
2. Provision of information services to help students with their research.
3. Provision of curriculum-development support to universities who wish to develop their courses within their own academic and technical frameworks.
4. Access to journal articles, research results, and news about latest agroforestry research.
5. Provision of online journals either in form of CD-ROM libraries or online resources offered in partnership with western universities.

DISCUSSION AND RECOMMENDATIONS

The major cross-cutting needs identified for most of the institutions assessed in these three assessments were development of relevant teaching materials and curricula review, acquisition of current books and publications, improvement of laboratory facilities, large

provision of fast computers, and development of human resources for training. Other included provision of adequate funds for carrying up-to-date research, strengthening collaboration and networking among institutions, strengthening education-research extension linkages, and provision of online journals.

Most of the faculties of agricultural sciences in the region with the exception of the faculties in South Africa, were established in the 1970's and 1980's and they are thus by World standards still very young (Merriam and Woodend 1995). There has also been declining levels of funding to faculties of agricultural sciences in the region thus adversely affecting teaching and research programs (Mrema and Woodend 1995). The decline, in funding, has been caused by the deteriorating economic position of most of the African countries that has led to the imposition of Structural Adjustment Programs with the resulting reduction in government expenditures and allocations to the universities. Donor funding has also declined due to a multiplicity of reasons. If agriculture is to be transformed in the region to produce enough food to feed the ever-increasing population, then increased funding and more innovative ways of course delivery and curriculum strengthening will have to be devised.

Linkages with other training and educational activities have to be developed and new and innovative methods of offering higher education and training in the agricultural sciences that are cost-effective and sustainable in the long-term have to be developed. In this respect, faculties may have to take the lead by undertaking internal reviews of their institutional mission and evaluation of their performance, with the view of building internal and external consensus necessary to develop long-term strategies and programs (Mrema' and Woodend 1995).

There has also been declining employment for agricultural and natural resource program graduates. Therefore, programs/short courses that train graduates for self-employment (i.e. commercial farmers, agro business) should be established. In addition to reviewing the current technical curricula to include some agribusiness courses, there is need also to offer short-term professional development and continuing education courses in, among other areas, agribusiness, entrepreneurship, communication skills, computer applications, industrial relations, corporate planning, and marketing. Given the current status of development of university faculties and their staffing levels, such courses can be offered most economically as regional courses. As demand increases, then in-country courses can be established.

PART IV

EMAIL PARTNER EXPERT CONSULTATION CONDUCTED ACROSS EASTERN AND SOUTHERN AFRICA

Dr. Speranza Ndege undertook the email partner (ema-p) expert consultation component of this TNA. The email consultation ('Ema-P' questionnaire instrument) was implemented within a timeline of one month.

METHOD USED

A selected sample of experts in life sciences who were familiar with the Traditional University Formal Lectures (TUFLE) mode of education in Eastern and Southern Africa were consulted by email. The consultation, e-mailed to 239 individual addresses throughout the region, sought precursor views concerning the existing ODL opportunities. The terms of reference for the exercise also suggested that individuals be drawn from the African Network for Agro-forestry Education (ANAFE) and the Eastern African Plant Genetic Resources Training Consortium (EAPGRTC) among others.

AN e-instrument was devised in an attempt to capture views on postgraduate training needs from sample target groups: students, teachers, mid-career professionals and partner institutions including emerging new partners such as the private sector, policymakers, and radio-TV media specialists (See table 2).

The Ema-p data-capture premise was that subjects consulted were a sample of a potential clientele⁸ in the context of the Global Open Agriculture and Food University. The Ema-p subjects were initially asked to respond to whether or not they knew of any existing agricultural and food related ODL opportunities in their country and the extent to which ODL curriculum development could benefit from CGIAR's competence and experience in food security problem-solving. Second, they were asked to state some of the programs they thought that the CGIAR could develop toward M.Sc. degree through this CGIAR initiative.

Table 2: Sources of information and the number of responses received from the Email consultation.

NO.	SOURCE	NO. OF RESPONDENTS	NUMBER NOT RESPONDED	TOTAL
1	Teachers (at Universities)	10	7	17
2	Mid Careers Professionals	2	15	17
3	Partner Institutions IGRI, IGRAF, ILRI, CXMMIT	3	14	17

⁸University Community, Research Community and Development Community.

<u>4</u>	PolicyMakers	4	13	17
<u>5</u>	Private Sector	7	10	17
<u>5</u>	Media Specialist	6	11	17

RESULTS

Only 17 individuals responded to the Email questionnaire, although disappointing was not surprising due to such factors as:

- The over-worked nature of the community addressed
- Problems with the email system
- The general proclivity of people to ignore surveys
- The community of practice of the addressed being different from that of the surveyor
- Lack of interest or familiarity with issues raised

Some of the respondent responses (as shown in Table 3) are matched against the 12-indicative programs of the GO-AFU.

Table 3: Twelve Indicative M.Sc. Programs of the GO-AFU (as shown in column 1) and matched with summarized Email extracted responses

Program⁹	Sample Of Ema-P Responses
Research Management	Sustainable precision farming & biotechnology
Seed Technology & policies	Grain storage and Post-harvest management
Agriculture & Applied Economics	Agribusiness
Plant Breeding for Tropical Agriculture	Agricultural policy formulation and analysis poverty and livelihood security
Natural Resource Management	Increasing biological yields
Forestry Management	Sustainable natural resource management
Aquaculture & Fisheries Management	Agroforestry in agriculture production
Food Security and Nutrition	Low input risk aversion husbandry for food agriculture
Livestock Management	Early warning reconnaissance
Biodiversity & Germplasm Management	Food and nutriceutic diversity
Water Resource Planning and Management	Livestock production systems
	Re-emphasis on orphaned traditional crops in agricultural production
	Arid and Semi-arid (ASAL) agriculture

⁹(<http://www.openaguniversity.cgiar.org>).

Program⁹	Sample Of Ema-P Responses
Crop Protection and Pest Management	Integrated pest management

The responses obtained (see Column 2) reflected the current research and/or curricula thrusts that were identified with respondent university employees or to some extent the direction being taken by their respective universities toward the developed/developing traditional curricula. Generally speaking, responses were closely in line with the delimitations worked out in the context of the Global Open Agriculture and Food University as shown in Column 1 of Table 3.



PART V

EXPERT CONSULTATION WITH KEY PERSONS IN KENYA: A CASE-BASED APPROACH

Dr. Levi S.M Akundabweni undertook the Rapid Expert Consultation appraisal (RECAP) using an interview instrument.

METHOD USED

1. Subjects identified as key persons

Criteria for selecting subjects included knowledge of subject matter, membership in scholarly community, involvement in university teaching, familiarity with the CGIAR's goal and mission, and knowledge of the political structure and educational governance in Eastern and Southern Africa.

Among individuals interviewed were two former Vice Chancellors of Moi University, one of whom is the current Director General of National Environmental Management Authority (NEMA) (*Subject 1 and 2*). The third person was a former Vice Chancellor of Egerton University who previously served as a Permanent Secretary in the Ministry of Education (*Subject 3*); An Honorable Member of the Parliament (MP) was consulted. This MP is serving as a Shadow Minister of Education. He is also a professor of nutrition and the founder of the Kenyan-based Rural outreach Programme (ROP) (*Subject 4*); A professor of land economics, and current executive secretary of the National Council of Science and Technology (NCST) was also approached (*Subject 5*).

Three heads of departments in the College of Education and External Studies of the University of Nairobi were also interviewed in one sitting (*Subjects 6, 7, 8*). The last person interviewed was a CGIAR retiree, a former ICRAF senior scientist (*Subject 9*).

2. Development of a questioning approach

The questions evolved around the following five major points:

Probe point 1: Public opinion in retrospect to the emerging Postgraduate Open Distance Learning (PG-ODL) initiative in agriculture, food, and natural resources management

Probe point 2: PG-ODL administrative and operative management environment

Probe point 3: PG-ODL research advisory and supervision

Probe point 4: PG-ODL curricula development and examinations

Probe point 5: Expectations as for the eventual effects, deliverables (i.e. milestones), and impact of the PG-Global Open Agriculture and Food University.

3. *Instrumenting the R.E.C.A.P*

The R.E.C.A.P as a collegiate instrument was used to capture attitudes, perspectives, and preferences of key persons with respect to the GO-AFU initiative. Most of the individuals interviewed hold senior positions in their respective fields. The diagnosis was intended to bring out:

- The perspective on PG-ODL as a new product for agricultural education and the projected role of GO-AFU. How such global initiative with regional appeal would compare to the prevailing situation on the ground.
- To enable GO-AFU to better understand policy issues and attitudes toward open learning programs and effectively prepare its planning phase.

4. *The face-to-face interaction technique*

Great care was used when developing the questionnaire and the questions were tested through mock interviews before using them. The process began with arranging a meeting with the respondent. During the meeting, the interviewer gave a short informal background introducing GO-AFU and ODL. Then, the 5 points were each in turn raised by the interviewer in an informal conversational tone.. The interviewer occasionally intervened to encourage a point of relevance, show empathy, or simply nodded as an interested listening party.

To take a more-or-less guided brainstorming form, the interviewer avoided any note taking and only stated the probe point without consulting a note book. Prior to the interview, the respondent provided permission for the interviewer to record the session. However, a recording device was rarely used so that the conversations were more spontaneous.

The information acquired was put into diagnostic notes as presented without deep and careful analysis to probe nuance and possible bias on the issues raised.

RESULTS

Responses from Subject No. 1

The respondent hopes that open distance education becomes a convention rather than an exception. In an effort to promote such mindset; he already has his notes in electronic format and directs his students to access them online. In this way, he says that there is no need to distribute the notes in class. He affirms that his notes can easily be converted into long distance modules.

As for his recollection of any collaboration with the CG centers during his tenure at Moi University; the respondent said that the CGAIR was not as actively involved with Moi University as it had been with Egerton University, where they helped in setting-up a Maize Research Training Centre (MRTC). He believes that it was easier for the CGIAR to move into Egerton University than Moi University given the long history of Egerton University as an agricultural institution.

Related to the delivery format as an open distance education modules; he indicated that it is a very good approach worthy strong support. Because, there is a serious need for an innovative delivery system to complement the outmoded chalk-and-board approach that still dominate teaching in our universities.

Looking at the advantages that a GO-AFU initiative can bring, he observed that students would have ready access to the latest information with a global perspective, thus reducing the informational and the digital divide gaps between the North and the South. Such prospect will promote and facilitate a knowledge economy. The linkage between the universities and the CG centers will increase students' access to CGIAR researchers and broadened their research options. Therefore, the postgraduate students can begin to address during their research problems related to national priorities. He strongly believes that to succeed, this initiative should be seen as a partnership between the CGIAR and the universities and not as a power relation.

For the potential PG-ODL research agenda, he argued that the matter needed to be careful planned. Universities are likely to remain conservative if the research agenda is dictated by others. Each CGIAR Centers has its own mandated research agenda as of what they are expected to deliver as public goods to the society. And this agenda is often too specific. This is very different for universities that do more academic research across the board and are increasingly looking into local issues affecting their agriculture. There are research areas relevant to the African agriculture with little western world interests. There are challenges about how much the CGIAR Centers would be prepared in absorbing this flexibility without worrying about how-not-to-be university-like themselves or universities worrying about engaging their students in CGIAR research in a narrow directed scope. Partnering in a mutual way is crucial, so that postgraduate students could capture and benefit from a wide range of research areas.

On curricula development and examinations he had this to say: the agriculture sector has been neglected in the region for a long time. First, there is a need to promote agriculture as an important discipline to increase its acceptability among the general population. For example, an executive agriculture program would be a fancier preference, with aspiration to hold high offices in the country; thus providing more incentives to people to major in agriculture related fields. As, many people in this region would want to move up the ladder in

that direction rather than move back to land. The negative perception on the agricultural field will only be reversed under a flexible policy environment. Agricultural policy formulation and analysis within an ODL program should target group of prospective urban students already operating in the subsistence sector.

There are many employment opportunities in the farming sector, particularly for agricultural engineers. ODL in social sciences and liberal arts is not new, but in the sciences in this region as a highly technical training, it will require a hands-on program. Technical training through open distance education must be seriously considered. Also, GO-AFU postgraduate programs should have high admission standards.

Post-harvest issues must be emphasized as a learning priority given the region's history of high harvest losses. Intermediate technology should be introduced with a commercial focus into agricultural sub-sectors with low returns in the short run; even if it means challenging the inside politics and leadership at the institutional and national levels. Note that this initiative must be based on local needs, if it is to be accepted by the stakeholders. If efforts are not made to revitalize the agriculture sector, it will be a tremendous loss for our economies, as agriculture can be an engine for development. GO-AFU initiative must be sustainable and considered as a mean to revive the agricultural profession; to create more access into learning, and move learning out of its predominant traditional mode. For the GO-AFU initiative to be successful, it must implement a pragmatic program that strive to change attitudes, stimulate policy orientation, and introduce the notion of accountability to regional institutions. An invitation should be extended to the NEPAD and the African Union to actively participate in discussing the way forward for investing in open learning as a regional arrangement that connects to GO-AFU and respective member countries.

Responses from Subject No. 2

There will be a saturation point in student enrollement at public universities as more programs open up, education becomes more expensive, within a decade or so. Hardly any universities anywhere in the world ever close for lack of a student body. At JKUAT self sponsored programs (Module II) have been so successful that their performance has gone up by 90%. There is a large pool of prospective students out there who will jump into PG-ODL mode(s) should one become available.

PG-ODL is thus a timely initiative. In fact, ODL is long overdue, but it must not be synonymous with a virtual university of its own. Whatever form the PG-ODL takes, being a new initiative in agriculture, food, and natural resources, it should be completely close to the recipients and donors. Postgraduate degree programs whether or not open require money for field research and this is expensive. Only few students when it comes to research in the area of agriculture and food can afford to carry out research at their own expense. Will there be CGIAR funding, the trustee type or will students also be required to undertake open distance research independent of budgetary constraints that plague most students- whether they are already in a workforce or not? And how about time away from their work stations to undertake research if their employment is not at the field or laboratory levels?

These questions are answerable, but in order to address them the major stakeholders including universities need to play a big part in the initiation process—and not a donor. ODL through a digital connectivity arrangement is just one of the ways to contribute to program

expansion in agriculture. For a successful implementation, the ODL must be coupled with practical training. Thesis supervision programs must be established. For example, retired professors and former CGIAR scientists for a token remuneration can play active role in field research supervision.

Residential type of laboratory arrangements with the CG centers is needed. The question as to what extent the CGIAR centres will contribute their laboratories toward the teaching function is paramount. A residential component should be included. However, would such measure convert GO-AFU back to a ‘non-open’ format?

Whereas this should not be an exclusive program from the way current postgraduate programs are conducted, the pilot program should be slightly detached from the mainstream curriculum planning to avoid conflicts in commonality. For example, it may be argued that ODL- assisted content may not exactly have the same equivalence in terms of creditworth as a conventional course unit. Transferability of credits even for the same course between modes could become an issue. Again these matters can only be locally addressed, which implies that local universities need to be involved in every step of the process such as the needs assessment analysis, formulation of the teaching objectives, curriculum development, review, implementation, and evaluation. Clearly, outside help will be required at the beginning for some time to ensure quality assurance. What will be the CGIAR’s contribution in all this?

Certainly, a consortium arrangement among institutions to launch this initiative from the ground will be required. The program should begin with a selection of high quality students and a fairly solid syllabus tailored to being as practical as possible. Open admission to all should mean all who qualify and no less.

Leadership in this process must have a national command post, e.g. one of the existing national universities or a new national university of open learning as a coordination centre. An ODL agricultural degree from the University of Nairobi, Moi University, or JKUAT can only differ by program differences existing between them. The institutions, however, will need to be complementary to each other and yet with their identity not compromised to avoid a consortium arrangement turning out to be an external threat.

The University of Nairobi as of now is better placed to play this convergence role within the regional equation. It already has the history of ODL and an entrenched professional tradition in agriculture and food.

Responses from Subject No. 4

On expectations for the eventual effects, deliverables (i.e. milestones) and impact of the PG- Global Open Agriculture and Food University’s she replied: “Enormous!”

She related it in a personal way by a story of her daughter who came to visit her recently from an overseas university. Time for study, the daughter sat down, plugged her laptop in and logged onto internet; got through her module, completed her assignment by answering questions and emailed to the overseas instructor. In a few days time, while still on vacation in Kenya, she got her exam grade online. “This is the way...! We need to be there with it! Or, be left behind as usual...!” She added.

Although ODL has a better history in the country given the role that the University of Nairobi has played, the national ODL program has focused on fulfilling the needs of adult education. Even if the definition had been right, there is something wrong if an 87-year old man finds that the only option in sight is to join a formal grade school given the free primary education in Kenya.

PG-ODL in food and agriculture is achievable if boldness is directed toward asking for a real change and working toward it; within a timeline and with the appropriate resources invested. Together, it can be done. Our international partners mean well. Some of us are internationally trained. There is also a lot of goodwill in the parliament. Introducing certain critical bills in the area of capacity building is thus feasible. On issues of this kind, the universities can organize discussion events. MPs can then participate in them in the public interest; and bring issues to parliament for further discussion.

There is little excuse on rigidity for conducting ODL research, field practice, and/or examinations. We think it *must* conform to traditional protocols. That is to resist change. A significant degree of digitization can be built into each of these levels depending on limits. The only difference between the First World and the Third World that creates the digital divide is in the means, and not the end. The means are now becoming affordable and we must access them. The help from those who have the means must be grabbed very fast when opportunity arises.

Impact? “The current evidence of the impacts of the ICT in the so called First World is enough! Need we ask?” she concluded.

Responses from Subject No. 5

The respondent states that ODL’s public image in Kenya as it stands today is unparalleled to any other in the region. However, Kenya has not lived up to this image by staying on top of things. The ODL practice in Kenya should have been growing fast given the history of ODL development at the University of Nairobi. The respondent has no knowledge of ODL’s growth in Uganda. Tanzania has some initiatives at the University of Dares Salaam. He believes that Malawi and Zambia lagged behind Kenya when it comes to experience and capacity in ODL. South Africa is however, far ahead in the open distance education domain. Ethiopia appears to be aware of ODL but is not yet well-established. Even with fewer universities than Kenya, Ethiopia stands out in the Horn of Africa as a fairly progressive country with its current institutions possessing high adsorptive potential for contemporary change. Orientation of agricultural education in much of the region is thus variable and in effect requires a strong need for an international intervention in planting an ‘ODL seed’ into the conventional agricultural curriculum.

Asked if the region was ready for PG GO-AFU learning with enough students to register; he replied that such initiative is actually overdue. He wondered why history had not reminded us about bringing the future into the present. When the interstates were being built in America, he remarked that they seemed like they would be too many of them. Today, there are more cars on the American interstates than could have been imagined when being constructed...while Africa

is still steeped in a debate about the value of the great North-South Road passing through deserts with more pastoralists than cars.

On the sustainability of ODL infrastructure, he cited the example of the University of Nairobi as having structures for capturing student fees across the board and such fees should be collected for running any academic program. ODL should, therefore, be self-sustaining.

Asked if this region needed ODL as an extra window for increasing capacity in agriculture and food disciplines, he said: "Absolutely, Yes". This is because, in humanities like law, self-indulged training among advocates 'off-time' is a highly valued aspiration. An example is a successful businessman who formerly owned a business and established the city transport system in Kenya. He was doing a postgraduate program in law. He studied one that suited him as an executive and that could have been in his own time, space, and place. There are many like him. Whether in agriculture or any other program, the ODL should be targeting people who have gone out after graduation and still have desire for further education and professional training. And therefore, it is important that such a group is catered for with a tailored-fit postgraduate (executive) program. Prospective postgraduate students will have different view of life than the one they held during their first degree graduation. They might want to study again in order to satisfy their curiosity, spend their mature time more profitably than they did when they were still slightly younger during their undergraduate degree, or have a felt need to advance while still holding onto their job. This clientele will prefer a kind of structured program in which they would go to class quickly between breaks, grab one or two ideas then return to work. Thus, the respondent strongly believes that there is a need for an open distance education system such as GO-AFU.

For example, he stated that it may take an individual longer to begin to read a page or two of a computer operating manual. However, it may be much easier and more appealing to learn how to operate a computer by just sitting before the computer and gets a hand-on experience.

With regard to Agricultural PG-ODL, one will need several laboratories. Laboratories located at the Faculty of Agriculture and the CGIAR centers as well as a public accessible laboratory, and a virtual laboratory. The laboratories will need to have more than one professor running a given program in order to avoid over-crowding. You need about 3 professors per course to amount to what we know of the American style of running a semester system. American campuses running ODL do not have vacated campuses at any time of the calendar year.

Most universities in the region pretend to run a semester system. The proper way is one professor running one semester while the other takes over the course in the next semester. ODL programs will need to be flexible with respect to who teaches what, where, and how. ODL's value should not lie in cutting back on existing staff as a saving measure but rather as expanding the available opportunities for more people to obtain higher university education. For instance, if you have a professor for day time, he should be resting in the evening while another one might wish to make some extra money should be at work that evening. That is the flexibility required since ODL is a continuous process.

He believes that the above scenario would not lead to an increasing staff size, which will worsen the current staff shortage. The most important thing according to him is not to provide the learning materials to the students, but to get them to appropriately use the materials. Thus, to give students more incentive to study, CD-Rom coupled with lectures notes must be provided to make the learning process more interactive and appealing for the students.

He mentioned as an example, a South African writer who lectured to a group he was a member. At the end of the lecture, he would sell the cassettes and a booklet on his subject. All of his audience bought the materials as a response to the effective public speaking. “Do you know, I can predict the readership of that book and the degree of listening to the cassette?” He inquired and continued “... It must have been extremely high...and without such personalization even academic material poorly utilized can begin to be junk mail if not put to effective use. The principle of popularizing a moving sermon after a service at church is not about the verse in the Bible someone already has at home in her study. It is about which preacher explained it, how he said it, what he thought of that verse, and what effect he intended for the listener to capture by way of effects. In other words, the spirit has to move through the speaker. Impersonalizing deliveries of cold science through subject digitization as teaching materials can send a tired worker to sleep or packing. In effect, there is limited advantage of electronic information over hard copies. In fact, no difference between it and a book because you spend time; and if one is a busy executive there will be limited time for him/her to go through electronic modules such as the ones ISNAR and other CGIAR centres have sent to various lecturers to slot into their teaching – a thing lecturers rarely embrace wholesomely.

Asked if use of computer conferencing on the World Wide Web, pictures, audio, and occasionally video and other video-conferencing aids without teachers in person substitute the traditional methods of teaching given the prevailing poor ICT infrastructure in the region he said: “Yes”. In the ODL system, it would be how to get the learners scheduled so that they will be able to set apart some of their time. With regards to the required ICT infrastructure, may be GO-AFU funding sources would need to examine together with its partners to address the constraint in order to ensure that programs worthy sustaining are running.

Commenting on the foreseeable effect, deliverables, and impact of PG-ODL in agriculture on the region, he agreed there could be several positive outcomes in the near future. The unfortunate dilemma, he noted, was that the region currently does not produce the needed capacity fast enough because of the lack of flexibility in the academic programs. There is too much government involvement and mindsets to resist changes- both at national and institutional levels.

Impact in the region shall be evident when the program will graduate enough students to offset the loss due to brain drain. Developing countries’ institutional staff retention and brain drain debates should not continue preoccupying international agenda provided that ODL operators at all levels (national, regional, and global) deliver their promises for agricultural development. However, institutions in this region themselves ought to undertake an appraisal of their own plight they might currently be facing and after taking stock of the prevailing situation should be in a position to redesign their own programs only with the *most* needed help from elsewhere.

He ended on an upbeat note by quoting the former President of Tanzania; the Late *Mwalimu* Julius Nyerere who spoke these words: “It can be done if you play your part. This writer could not help asking the professor “Why has Africa then not done it that well since those days? Why have the universities not yet done it? Why...?”

To which he responded:

- Many unfunded mandates
- The No-money Syndrome
- Let-somebody-else-do-it
- Inertia
- Oh-not now, later!
- Use-the-resource-but-forget-the-source”

Responses from Subjects Nos. 6, 7, and 8

This College started as an independent centre for residential adult education way back in 1956. It was amalgamated with the Extra-Mural Department in mid 1960s into an Institute and subsequently renamed the Adult Study Centre (1966). In 1967, a correspondence course unit was added to the Centre as its first form of Distance Learning. In 1988, it was re-structured into CEES with four faculties and two institutes; the Faculty of External Studies being among them. The Faculty consists of Departments of Education, Extra-Mural Studies, and Distance Studies. The activities of the Faculty of External Studies can holistically be described as having a strong basis in ‘Open and Distance Learning’. A problem of ODL lagging behind at agricultural faculties in various sister universities including the University of Nairobi itself has been purely a matter of inertia. Mechanisms to remove this inertia include a top management’s strong will toward ODL adoption.

Asked on the extent to which the three heads of departments were familiar with the goals and mission of CGIAR centres, the team acknowledged awareness of ILRI’s and ICRAF’s research presence in Kenya. On learning of the CGIAR’s global role in agricultural research and Kenya playing a host to several CGIAR centres in the region, in their opinion, the country was best placed to serve as a regional hub in playing a larger role to the image building with in the region of the GO-AFU initiative.

There is an upbeat spirit in the College of Education and External Studies (CEES) at the Kenyan Kikuyu Campus-University of Nairobi on ODL as well. The current mood is that programs at the university will have to be all-inclusive with ODL designed within them to address the individual needs of a variety of learners. Module III as ODL is now dubbed at the University of Nairobi is seen as an important mode that should offer expanded possibilities for educational, social, and emotional growth among all students. CEES Educators who have all along practiced this inclusive schooling approach through years of service to the University of Nairobi and to the Kenyan public have the conviction that the value of ODL lies in the following:

- Increased exposure of students to the natural diversity of the community as part of their learning setting;
- As they learn, ODL students are assimilated to the settings of the contemporary information technology;
- Studying while on the job gives ODL students an education with a purpose since many are already in the job market and might already have decided their career direction.

On PG-ODL program sustainability. Research activities in natural resources, agriculture, and food, which can be carried out by students of PG-ODL, on-farm and the flow of research findings thereof through training and extension education are in themselves means that will sustain PG-ODL programming.

On PG-ODL administrative and operative management it came out that for open and distance learning, candidate centres could include any of the following:

1. Single mode institutions,
2. Dual mode institutions, or
3. Mixed mode institutions

Whatever the mode, a team approach for pooling/sharing resources is a critical factor. Local management of PG-ODL in programme development might entail, for example, the use of industrialized processes, so that division of labor between the university and the CGIAR infrastructure as shown below:

BEST VALUE ADDITION?

	<u>CG</u>	<u>JOINT</u>	<u>UNIV.</u>
1. Curriculum development and writers	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
2. Review and editorial persons		<input type="checkbox"/>	
3. Studio and printing persons	<input type="checkbox"/>		
4. Stores and material circulation	<input type="checkbox"/>		
5. Student support service.			<input checked="" type="checkbox"/>

Best value for local planning for the non-digital facets of ODL have to come from a university for:

- Overcoming physical distance, particularly in remote areas
- Solving time or scheduling problem
- Expanding the limited number of places available by reviewing the stringent entrance requirements
- Accommodating low or dispersed enrolments

For a GO-AFU involvement, there will be need to develop an effective cross-over capacity along the intra-institutional, inter-institutional, national, regional and global gradients so as to be in a position to customize the relevant products and services to fit local needs within certain pedagogical considerations; and be positioned as well to play a consultative role (i.e. a clearing house) as its primary mission.

As for PG-ODL curricula development and examinations a particular case of Commonwealth Learning is worth mentioning. Initially, all the units came to particular recipients from the program. The universities who received them wanted to know which of their own units they could add to a particular thrust so that the Commonwealth program could be locally oriented. Recipients demanded to know whether or not they needed to accept all the 14 units on the menu and made to adopt them wholesomely or would they to be allowed to add units ... so that the curriculum could be customized to fit their existing program.

In light of the above, GO-AFU would in effect, be more of a clearing house and also a global manager. A clearing house in that it would have to bring the best minds in the world together for drawing up a program of instruction and research and also for dealing with issues of international protocol with regard to the flow of products into various university departments and/or faculties. The faculty pathway would in effect begin to be managed as a semi-permeable membrane such that:

- a.) There would be an entry of a new program into the approval routes of the university
- b.) Once the entry is made, Faculties would find themselves in a position to defend what has come out as jointly developed programs.

The GO-AFU secretariat does not have to be a big structure, but a small team working as an agent of cross-fertilization between the world's eminent experts and the prospective client institutions. The experts, obtained through the GO-AFU matching of client needs against the required expertise, would visit a particular program in some given country to assist develop a particular program or help in reconditioning it.

Once in operation, GO-AFU should be able to know from which CGIAR center a given expert could be extracted from to provide the required input for a particular country or region. In event that financial resources would also be needed, GO-AFU could then also look for funding from traditional or non-traditional sources.

One of the ways in which departments offering ODL programs can interlock with this process is through a coordination center. At the University of Nairobi, discussions have been centered on configuring the position of an ODL coordinator at the level of a dean of faculty so that what happens at a department can find its way up to the coordination point. The question is how to build the capacity of such persons as they may not have had the capacity. One has to therefore, think about short or sometimes longer duration courses (e.g. postgraduate level)

On PG-ODL curricula development and examinations, all of the examinations at the University of Nairobi except the Continuous Assessment Tests (CAT) remain confidential as they undergo external examiner moderation besides the related processes. They are then thoroughly discussed by both the departmental and faculty boards before Senate approves results and entered into an official transcript. In this way, all examinations are quality assured. Any other parallel examinations would have to conform to these requirements as is already the case with the currently administered ODL tests at CEES.

Given that ODL CATs are done at a distance, there is the possibility of a student cheating. These incidents although they happen, are unlikely to ‘burn’ any substantial portion of the normalcy that exists as the ODL university examinations given tend to remain in conformance to the set rules of invigilation.

On Expectations as for the eventual effects, deliverables (i.e. milestones), and impact of the PG-Global Open Agriculture and Food University, the team conceded that these can be felt in both the immediate and long-term.

Findings derived from Subject No. 9

As one looks at the CGIAR system, already being more advanced, would ODL be a significant global issue for the centers worth investing in—I asked? To which he answered:

One hazards to speculate that they should only concentrate in a few pilot areas where postgraduate training would appear relevant within the vicinity of the GO-AFU umbrella...as the CGIAR centers could possibly find it difficult to globally spread themselves out in too many countries and disciplines. Initially, the CGIAR may have to first of all pilot the initiative to see if a real need exists for them to be involved and in what manner.

If the CGIAR centers are willing to develop academic programs, any progress to absorb such innovations will depend on how quickly these can go through senates of respective universities so that they become acceptable. It will require that methods are developed to grant CGIAR scientists joint academic appointments and ways of absorbing them into academic boards of universities. This may not be that complicated in the sense that the effort would require certain minimum costs. There would have to be a forum where different parties will agree to meet to plan and implement programs together.

A balance would also be struck at how many students can be maintained in an open learning distance mode. Arrangements for more students that can be reached could have to be done along certain schedules that allow scientists to catch up on other things. The worst part of thesis/project examination is when a busy examiner has to read through more than one thesis to assess whether the thesis/project is adequate in form and content for award of a degree. This may again require a concerted effort in rounding up stakeholders to deliberate on what large numbers will mean as far as examinations within a traditional format can still be carried on in the same way. It is doubtful that CGIAR in their current set-up can afford resources toward a mixed mission of research and teaching unless a special support liaison wing under a CGIAR umbrella could specifically be created for full time education engagement.

The CGIAR system now is seemingly being pushed very hard to play a more active role as an agent of dissemination; so that coming from that background to the universities is an opportune time to influence the direction of ODL in a participatory way. There is a lot of thought, however, that must go into who meets the cost of a staff's input time, laboratory, or bench costs among other considerations.

PART VI

HIGHLIGHTS GUIDING ESSENTIAL CONCLUSIONS AND RECOMMENDATIONS

5. EMERGING GAPS BASED ON THE OVERALL DIAGNOSIS

5.1.1 Further consider **how** the high concentration of qualified personnel, well equipped laboratories, reference materials, and good internet connectivity among other resources available within and among CGIAR centers can be utilized to bridge the gap in training needs currently being experienced in educational institution(s) with already established organizational structure.

5.1.2 Undertake a **comprehensive review of the current postgraduate curricula** (in agriculture, natural resources and food) that are currently offered by traditional universities in Eastern and Southern Africa. This may need to be done with a view to adding new ones and/or revising existing ones so as to make them more relevant and attractive.

5.1.3 While focus is on Open and Distance learning modes to cater to students who are unable to attend the Traditional University face-to-face learning mode, any new ODL programs once approved would similarly have a spill-over benefit to regular students enrolling under a residential arrangement.

5.1.4 Email consultation has a definite value in needs assessment provided that:

- It is done through respective heads of departments
- Backup calls, letters and reminders to circumvent possible network problems are included in the design of the email consultation instrument
- Plan to handle people's tendency to ignore surveys by using effective email instrument design including but not limited to: follow ups and guided responses to help reduce respondents' fatigue
- Attach the identity of strata of the respondents to their response in order to meaningfully analyze the data

5.1.5 Based on the key persons interviews following conclusion were drawn:

5.1.5.1 Current mood

- There exists a strong national expectation and mood for ODL to succeed as a parallel mode of education.
- GO-AFU initiative (although sketchy in the minds of many people who do not know the CGIAR) is seen to be associated with some relevance to LDC capacity needs. There were strong expressions that the GO-AFU intervention, however, should not be mistaken by African universities as a plan by the GO-AFU initiators to play the “big brother to the helpless little brother”. Such an impression would

seriously weaken the foundation for the CGIAR-led initiative to succeed penetrating into a strong partnership.

- The possibilities of how and/or whether the partner LDC traditional universities are positioned to incorporate ODL in their programs must be carefully and strategically worked into the initial grand plan. This will require a mobilization of official university protocol as much as possible throughout the planning process.
- According to the findings, the affected parties in connection with this initiative have interests, attitudes, practices, and obligations that are too diverse to take for granted. In retrospect, therefore, a comprehensive needs assessment methodology and a coverage strategy is required.

The diagnosis of postgraduate training needs in agriculture and food via open and distance learning (PG-ODL) in Eastern and Southern Africa reveals that the conditions are right for positive progress toward the realization of GO-AFU initiative. It, must, however, be a creation of many (old and new) faces all in one.

5.1.5.2 The Gaps

- PG-ODL as a convention rather than an exception needs to be carefully worked into university's agricultural, food, and natural resources management curriculum from the inside in conjunction with outside partners. The drivers are both financial and infrastructural rather than external leadership.
- The 'Chalk-and-Board' culture at many universities that still hangs around as a heavy cloud of conservativeness needs to be converted to modern delivery technologies (e.g. power point, electronic log-ins, CD-Roms, etc) as precedents to condition instructors toward the culture of distance education in agriculture. GO-AFU could undertake an active gap-stopping via technology acquisitioning and ODL capacity strengthening strategies.
- International community should instead establish a Research and Scholarship Support Wing in Agricultural, Food and Natural Resources Opening Learning (similar to United Nations University) as a parallel CGIAR institute with a clearer mandate to interlock with traditional universities
- ODL through digital connectivity, CD-Rom libraries, and electronic delivery arrangements is one way to contribute to ODL program expansion in agriculture, but GO-AFU could also play an active support role, jointly with universities in founding ultra modern ODL port-of-call centres for tutorial units, student practical sessions, and/or demonstrations
- There is also a lot of goodwill in the African parliaments. Introducing certain critical bills in the area of capacity building is thus feasible. On issues of this kind, there is need for a more active University-CGIAR-Legislature linkage toward the GO-AFU initialization

- In operationalizing GO-AFU, CGIAR Centers must strive for concessionary membership on bodies within university structures that handles and approves curriculum.
- The unfortunate dilemma is that the region currently does not produce the needed capacity fast enough because of lack of flexibility in the current academic programs. There is too much government involvement and resistance to changes- both at national and institutional levels. University-CGIAR interplay and interface strategies will need to be put in place during the GO-AFU project conceptualization, formulation, and implementation across all points of inter-institutional permeability.
- “We hardly put our money where the mouth is...” is a serious gap hampering rapid progress toward new initiatives, changes, etc. and that is why university curricula in the region have remained slow to change from tradition to novelty.
- “The No-money Syndrome...” on the part of governments in the region is limiting capital-venture investment toward the expansion of educational opportunities to higher learning institutions based on the argument that basic education is the more urgent priority.
- Procrastination
- Resource (e.g. financial advantage) and Source (Best advantage) can be conflicting in fostering partnerships of mutual trust and may need to be carefully balanced in retrospect to what the GO-AFU home should look like
- All entry points in university structure which tend to be open systems are underutilized for change penetration. Once targeted, they could be an entry of a new program into the approval routes of the university. Once the triumph entry is made, Faculties would find themselves in a position to defend what has come out as jointly developed University-GO-AFU programs.
- For GO-AFU involvement, there needs to be a well-developed effective cross-over capacity along the intra- and inter-institutional, national, regional and global gradients so as to be in a position to customize the relevant products and services to fit local needs within certain pedagogical considerations.
- Initially the CGIAR may have to pilot the initiative to see if a real need does exist for them to be involved and in what manner.

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6.0 CITED/CONSULTED SOURCES

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3. Professor Raphael Munavu; Cell phone: 254 (020) 0722 820 788 or 0733 621 878
4. Professor David Ngugi; Cell phone: 254 (020) 0733 706 818
5. Professor George Kingo'riah; Cell Phone: 254 (020) 0722 5151 30
6. Dr. Gakuu and colleagues (College of Education and external studies, University of Nairobi); Cell phone: 254 (020) 734 516 771
7. Professor Kiptoon; Cell phone: 254 (020) 0733 705 363
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APPENDIX I: The Resumes of Key persons interviewed

University teaching as a core function qualification (GROUP A EMINANCE)	Research authority (GROUP B EMINANCE)	University top management positions (GROUP C EMINANCE)	Experience on the role of agriculture, food & natural resources in development (Group D EMINANCE)	Political Centre Stage/ Educational governance (Group D EMINANCE)
Raphael Munavu- PhD, M.Sc., B.Sc. (Professor)	Tropical Plant Products Chemistry. Has mentored numerous M.Sc. and PhD students over the last 30 years.	Former Deputy Vice Chancellor at University of Nairobi, Principal of Laikipia College Campus of Egerton University and Former Vice Chancellor, Moi University.	Currently Chairman of the Kenya Examinations Council.	
Ratimo Michieka- PhD, M.Sc., B.Sc. (Professor)	Tropical weed science. Has mentored numerous M.Sc. & PhD students for over 25 years.	Former Vice Chancellor at Jomo Kenyatta University of Agriculture and Technology (JKUAT).	Currently Director General at the National Environmental Authority (NEMA).	
George King'orah- PhD, M.Sc., B.Sc. (Professor)	Land economist. Has mentored numerous M.Sc. & PhD students for over 30 years.	Former Deputy Vice chancellor, Egerton University.	Executive Secretary at the National Council of Science and Technology (NCST).	
Hon. Ruth Oniang'o- PhD, M.Sc., B.Sc. (Professor)	Human Nutritionist. Has mentored numerous M.Sc. students & PhDs over 25 years	Former member of a University Council and JKUAT senate.	Founder and Director of Rural Outreach Programme (ROP) – a nongovernmental agency.	Current Member of Parliament (MP). Shadow minister of Education.
College of Education and External Studies (CEES): Three departments:	Chair- Extramural studies; Chair- Education; & Chair-Distance Learning	Oldest experience and leadership in ODL in the region.		
David Ngugi- PhD, M.Sc.,	Crop scientist (Agronomist).	Retired ICRAF Scientist, Former	Former Rockefeller Foundation.	

B.Sc. (Professor)		Dean of Faculty of Agriculture, Univ. of Nairobi.	Consultant; Active in community affairs.	
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