

**Leadership for Higher Education
in Agriculture**

**Proceedings of a conference held in
Amsterdam,
The Netherlands,
July 22-24, 1999.**

**Edited by
David G. Acker
Iowa State University**

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This book documents the proceedings of a major international conference on higher education in agriculture held in Amsterdam in July 1999. The conference was organized by the Global Consortium of Higher Education and Research for Agriculture.

Amsterdam was selected as the site of the inaugural conference of the Global Consortium because it is situated at a true global crossroads of cultures, of telecommunications, and of transportation. The conference was very appropriately held in The Netherlands because of the enlightened reforms being spearheaded there in the agricultural education and research system. This major reform effort is being led by Rector Cees Karssen of Wageningen University and Research Centre who opened the conference on July 22, 1999.

Nearly 150 participants from over 30 countries attended the conference. From this starting point a membership drive was launched. Today, I am proud to say that the consortium has nearly 200 members in over 100 countries.

I encourage you to become a member of the Global Consortium of Higher Education and Research for Agriculture.

Your application can easily be submitted on-line at: <http://www.gchera.iastate.edu/>

Once you are a member, you will find a wide range of working groups in which you can participate. Soon after you register on-line, the working group leader will contact you to give you details on how to become involved.

Watch the web site for announcements of upcoming conferences. We look forward to seeing you at the next conference of the Global Consortium of Higher Education and Research for Agriculture, scheduled for 2001.



Martin C. Jischke

President, Global Consortium of Higher Education and Research for Agriculture

President, Iowa State University of Science and Technology

The Global Consortium of Higher Education and Research for Agriculture is indebted to the following sponsors who supported the inaugural conference, including the publication and distribution of this book to over 1,000 academic leaders throughout the world. Specifically, we would like to thank the following:

•
Farm Foundation
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We are also grateful to the presenters, reaction panelists, discussion leaders, and chairs for their significant contributions to the success of the conference. Their names appear in Appendix I.

We would like to thank the attendees who invested time and money to attend and participate in the conference.

Their names appear in Appendix II.

We especially want to thank the individuals and businesses who worked diligently behind the scenes to make the conference and this book successful, including Shelley Taylor (conference support); Charles Dobbs (planning, communication and fund raising); Linda Chimenti (copy editor); Juls Design; the Amsterdam Hilton; Louise Rothschild (communications); Sue Finestead (reports and correspondence); Galina Spike (database management); Denise Bjelland (grant proposals and accounting); and Al Brooks (purchasing).

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A Global Perspective on Change in Higher Education for Agriculture

Martin C. Jischke, David G. Topel, and David G. Acker

Agricultural universities worldwide are facing numerous challenges including increasingly limited resource allocations, declining enrollments, keeping up with advances in information and other technologies, remaining aware of and responsive to clientele, and the need to aggressively globalize their teaching, research, and outreach programs. Although the scale of the problems and the local conditions vary across and among regions, there are remarkable similarities in the fundamental nature of these challenges.

The realization that these are shared challenges, combined with a political and economic climate that lends itself to the lowering of national barriers, presents an environment conducive to global networking and cooperation among universities. However, existing international organizations do not have the mandate to bring together agricultural universities on a global scale to share lessons learned.

The Institutional Landscape of Global Cooperation in Higher Education

The current landscape of cooperation among entities engaged in higher education in agriculture is a “patchwork” rather than a network. The patterns of this cooperation are easily legible. First, national and regional cooperation is fairly well defined. Examples include the Asociacion Mexicana de Educacion Agricola Superior in Mexico, the National Association of State Universities and Land Grant Colleges in the United States, and the Inter-university Conference of Agriculture and Related Sciences in Europe.

Second, there are a number of international or multilateral agencies engaged in serving higher education in agriculture, either directly or tangentially. For example, the United Nations Educational, Scientific, and Cultural Organization (UNESCO) focuses on education in developing nations but does not concentrate on agricultural education. The Food and Agriculture Organization of the United Nations (FAO) focuses on agriculture - including agricultural education - but primarily in developing nations. The Organization for Economic Cooperation and Development (OECD) has an interest in higher education and agricultural knowledge systems but works principally with its members in industrialized nations.

This patchwork of organizations is inadequate for supporting cooperation on a global, multi-regional basis inclusive of both developing and developed countries. Such benefits as interuniversity student and faculty mobility, curriculum sharing, and cross-fertilization of thought improve with the scale of interactions offered by global university cooperation. With the development of communication technology, truly global associations are now feasible to consider.

During 1998 and 1999, there were important international meetings in Paris, Moscow, Kiev, Buenos Aires, Amsterdam, and Panama City dealing with new visions for the future of higher education for the twenty-first century. These meetings began to build bridges among new partners and to build awareness of the power of cooperation on an international scale.

This chapter describes the birth of a new global networking mechanism for agricultural universities and the first global meeting of this network, a conference held in Amsterdam in July 1999. The name selected for this international network is the Global Consortium of Higher Education and Research for Agriculture (GCHERA). This chapter also serves as an introductory chapter for this book that was developed as a product of the conference.

Consortium Background

Plans for the Global Consortium were developed in September of 1998 at an international conference in Kiev. The conference marked the 100th anniversary of the National Agricultural University of Ukraine and the completion of a four-year university linkage project involving Iowa State University and funded by the United States Information Agency. The consortium was formed as a result of significant shared concern for the future of the planet and a desire to see higher education in agriculture play a leadership role in solving problems associated with food security and environmental sustainability. In the process, it became evident that in order for higher education to deal effectively with complex problems on a global scale, two things needed to happen. First, significant reforms needed to take place in the institutions themselves to permit them to serve their societies effectively. Second, to insure maximum impact of effort, cooperation on a global scale was essential. A consortium mission statement was developed to reflect these priorities:

To foster global cooperation for the improvement of higher education and research for agriculture as a prerequisite to solving the food security and environmental problems confronting our world.

The consortium founders designed it to be helpful to institutions worldwide that are working to make significant reforms in their systems of higher agricultural education. The consortium aims to serve institutions with programs in agriculture, veterinary medicine, and natural resources management, including the biological, physical and social sciences dimensions of these fields. The consortium is governed by a regionally balanced Executive Committee and led by a president. Iowa State University President Martin Jischke was elected as the founding president of the consortium and will serve until 2001.

Conference Structure

The Amsterdam conference opened with a welcome from Professor Cees M. Karssen, Rector of one of the top agricultural universities in Europe, Wageningen University and Research Centre. Dr. Martin C. Jischke followed, with a keynote address examining global trends in higher education for agriculture arising in this new era of cooperation. Two days of presentations followed covering successful cases of reform from Africa, Asia, Europe, Latin America, the Middle East and North America. These cases were presented by university leaders who designed and carried out major institutional reforms. These individuals represent a fascinating combination of skills: innovation, scholarly achievement, academic leadership, a passion for quality, and a strong sense of social justice. Each case study was followed by a reaction panel providing insights from the perspective of experience in different institutional and national settings. On the third and final day, four interactive roundtable discussion groups were convened on the following subjects:

- Institutional Leadership in Reform
- Quality Improvement in Undergraduate Education
- Public and Private Partnerships
- Globalization of Teaching and Research

Observations from the Conference

The following observations relate to reform of higher education for agriculture including the societal context for reform, the urgency associated with the consortium's mission, and the role of other partners in pursuing our collective challenges.

Global nature of trends

Trends that surfaced at the conference are global. There are variations specific to local conditions but the challenges confronting agricultural universities are surprisingly similar whether the institution is located in a developing or a developed economy. Dr. Csaba Csaki pointed out, however, that specific solutions must be localized. We learned that we have much to gain from sharing our experiences. Sharing of lessons learned on a mutually beneficial basis promotes a spirit of cooperation rather than one of dependency.

Reform in higher education must accompany societal reform

Socio-political shifts are occurring all over the world. The global shift toward market-driven economics has enormous implications for higher education throughout the world. Some reform processes are more open to new ideas than others. Those universities that have invested and adapted themselves to keep up with changes in their national economies are on the cutting edge. Examples of universities that have been successful are reported here in the following chapters.

Successful reform efforts depend on a number of factors

Major reform efforts in higher education for agriculture depend on a number of mutually reinforcing factors including external help, additional funding, and leadership. Perhaps most importantly, the cross fertilization of ideas can infuse enormous energy into a reform process.

Engagement

The success of a university depends on its ability to stay in touch with the world outside of its gates. Those that are directly engaged with society can move ahead as the economy moves ahead. Those institutions that are disengaged become mired down and don't keep up with the needs of society.

Globalization

Each nation is concerned with globalizing its academic and research programs, partly in response to trends such as the globalization of information, economies, and environmental concerns. Globalization requires strategic alliances and an investment of resources.

Resources

Although additional resources are needed to make widespread changes, it is clear that some action can proceed without massive funding, drawing on the benefits of cooperation across political borders. In general, there is a paucity of resources for agricultural education.

The stakes are high

There is urgency to the tasks associated with food security and environmental sustainability. For example, the target established at the World Food Summit (1996) is to reduce the number of malnourished people on the planet by 50 percent by the year 2015. There are currently 6 billion people in the world, and the population is expected to rise to 8 billion by the year 2020. The consortium can make a difference in terms of food security, world peace, and mutual understanding through exchanges of people and ideas related to higher education and research for agriculture.

Food security and environmental sustainability are critical problems and we will need the best minds working together to solve them. The challenge for agricultural universities is to attract the most talented students to work on these critical problems. The fields of biology, biotechnology sciences, and information systems, are all exciting areas for students to pursue that will have a direct impact on saving the planet.

Institutional leadership

When major shifts occur in societies new leaders emerge in a variety of institutions. University reformers that emerge when such shifts occur are often characterized by opportunism and entrepreneurship as well as by a solid academic and scientific reputation. We learned that institutional leaders can and do make a difference. Leadership development is critical for the continuous improvement of existing leaders and for cultivating the next generation of academic leaders.

The value of networking

The conference atmosphere was one of unanimity of purpose. The conference permitted participants to take important steps forward in their thinking about reform of higher education in keeping with the mission of the GCHERA. It was clear that there is a hunger for this type of networking. When given an opportunity to form working groups to continue the work initiated at the conference the response was overwhelming. There is a message in the enthusiastic and spontaneous response of people to these working groups.

Other partners active in institutional reform

We learned that there are a number of groups and agencies that are eager to cooperate with the consortium. These include the OECD, FAO, UNESCO and the Global Forum on Agricultural Research. We also observed that there are donors committed to ensuring that this global consortium prospers. Those sponsors that supported the inaugural conference took the risk of supporting a new and untested idea.

Future Conferences

Conferences that will be of special interest to those involved in the reform of higher education for agriculture include:

- **The Agricultural Knowledge System**, Paris, (OECD) January 10-13, 2000
- **Global Consortium of Higher Education and Research for Agriculture**, 2001 (date and venue to be announced)

Join the Global Consortium

Institutions engaged in or associated with higher education and research for agriculture are encouraged to join the consortium. The cost of an annual membership is very modest. For \$25 per year an individual or an institution can become a member. On-line application for membership is available at:

<http://www.gchera.iastate.edu>

Opening Keynote Address: A New Global Era for Higher Education in Agriculture

Martin C. Jischke

The Global Consortium of Agricultural Universities of which this conference is a part, is the result of some big dreams.

It is the result of people who dream of a very different world than the one with which we have struggled throughout much of our human existence. They dream of a world not of contradiction and conflict but of cooperation and collaboration. Their dream is the dream of the different people of the world coming together in a truly global community.

It is not a new dream. It goes back to the earliest civilizations—indeed, as far back as the different peoples of the world have had the capacity to look beyond their own borders and dream of what could be. People such as Socrates, who, some 2,400 years ago, observed, “I am not an Athenian or a Greek. I am a citizen of the world.” But as we all know, transforming our world from one of many peoples and many nations into a world of one community takes more than dreaming—much more than dreaming.

I am reminded of an old verse that has become one of my favorites. I do not know where it originated or who wrote it. All I know is that the words are inscribed on a plaque hanging on a wall of an old church in England. I don't know which church it is but probably some of you do. The words inscribed on it are these:

*A vision without task is but a dream.
A task without vision is drudgery.
A vision and a task are the hope of the world.*

Creating this new world—making the dream of a global community become real—requires vision and task. More importantly, it requires people who have this rare combination of skills: dreamer and taskmaster; visionary and laborer. In addition, they need one other very special and very important quality, and that is the ability to be a leader. And not just any kind of leader, but an effective and inspirational leader. Vision, task, the courage and conviction to follow the vision, the ability to inspire and lead others in working toward the vision, and the skill to work effectively in making the vision become real: this is indeed a rare combination.

So when you find someone like this, you want to listen to them and you want others to listen to them, as many people as possible. That is why we have invited all of you here, to this conference on Leadership for Higher Education in Agriculture. Building this global community will take lots of people, and most importantly, lots of leaders.

There has never been a more propitious—or more urgent—time to build this global community. It is propitious because the character of the world itself is changing, away from separation and isolation and toward openness. Things that were built on separation and control are crumbling: the Berlin Wall, controlled economies, and controlled lives. These are being replaced by new governments, new institutions, and new agreements: more democracies, more free trade agreements, and more educational and research exchanges, all leading to a greater openness between our national, economic, and cultural entities. Barriers that kept people, ideas, and goods out are being replaced with bridges to bring these things, along with understanding in.

The need to create this global community is urgent because we have never before faced challenges of the magnitude that we face today. They are truly global challenges in size and scale especially for the business we are all in which is ensuring that this community can continue producing the most basic of all human necessities—food.

Our population is growing at an alarming rate, one that threatens the planet's ability to sustain itself. Not until 150 years ago—in 1850—did the world's population reach one billion. It took just 80 more years for it to double to 2 billion and just 45 years to double again to 4 billion, a milestone that was reached in 1975. Today, less than 25 years after reaching 4 billion, the population has just topped 6 billion and estimates are that it will reach 8 billion by the year 2020. These are staggering numbers.

And not only is the population growing but advances in technology and the emergence of global economic markets are giving people the resources to aspire to a higher standard of living. We face yet another challenge in that population growth is not uniformly distributed around the world. Therefore, our resource distribution systems—such as those for food—while adequate for some parts of the world are woefully inadequate for others. This combination of a constantly escalating population and the desire for a better quality life is putting tremendous strain on our environment to produce the food to sustain this growing population and to provide the other resources that are needed to attain a higher standard of living, such as better building materials, clothing, and energy to make our living environments more comfortable. This has significant implications for agriculture which uses 70 percent of one of the world's most precious and limited resources—fresh water. These are challenges of global perspective and global scale, which is why there has never been a more urgent need for the people of the world to begin coming together and to begin acting globally.

At last year's international conference on higher education in agriculture, held in conjunction with the 100th anniversary of the National Agricultural University of Ukraine, I urged that we, as leaders of the educational and scientific community—a community that has long recognized the need to think and work globally—need to step forward once again. We need to take the lead in addressing these daunting challenges of feeding the world's growing population and in ensuring the sustainability of our food production resources and capabilities. Several of us, including my friend and colleague, Dr. Dmytro Melnychuk, called for the agricultural higher education community to develop an agenda that works to bring our institutions together in cooperative and collaborative initiatives and that builds on these initiatives to bring all of our nations and peoples together in actions that begin addressing the challenges that we face.

Among the items that need to be included in such an agenda are the following. First, we must learn to share: share resources, share ideas, and, most importantly, share knowledge. The esteemed scientist Robert Oppenheimer wrote, "...the unrestricted access to knowledge, the unplanned and uninhibited association of (people) for its furtherance—these are what may make a vast, complex, ever-growing, ever-changing, ever more specialized and expert technological world, nonetheless a world of human community." (*Science and the Common Understanding*, 1953)

Related to the idea of sharing is a second agenda item: We must work through partnerships—strengthening existing partnerships, and seeking out new partnerships.

We also must identify areas of common ground and common understanding and from these, begin to develop programs that we can all support. In the area of agricultural higher education, we need to increase our understanding of each other's curricular structures and from there work toward greater common ground so that our students will be able to expand their educations by moving easily between and among our institutions. Identifying areas of common ground and common understanding is also of primary importance as we develop our research agendas for the future to identify both broader, overarching issues that have global impact and areas within these issues where each of our institutions

brings special expertise. After doing this, we must look for new opportunities to work collaboratively on these issues and to put our scientific and technological resources to use to meet the needs of the world's people.

There are many other items that could, and should, be included in this agenda and we all need to be involved in its development. However, the overall goal of this agenda, I believe, must be to build our capacity for collaboration—a global capacity for collaboration.

These issues clearly pointed to the need for a new global organization to begin building our capacity for collaboration, and the result was the creation of this organization—the Global Consortium of Agricultural Universities. The mission of the consortium is to foster global cooperation for the improvement of higher education and research for agriculture as a prerequisite to solving food security and environmental problems confronting our world. It was immediately decided that this consortium would be as open and inclusive as possible; would involve as many participants, from as many parts of the world, as possible; and would keep the cost of participation as low as possible to further encourage broad participation. Our consortium is still quite young—less than one year—and it continues to evolve.

One decision that was made early on was the methodology to be employed by the consortium in carrying out its mission. It is the one we all use in carrying out our own individual missions, and that is education. We will educate by conducting international scientific conferences on topics of critical importance—with this conference on leadership being the first—and by sharing international models of curricula and assisting in curricular reform and alignment.

In addition, we have pledged to support the activities of existing international organizations that already are at work on these issues. These agencies include the United Nations Educational, Scientific, and Cultural Organization (UNESCO), the European Association of Agrarian Universities, the Food and Agriculture Organization of the United Nations (FAO), the United States Agency for International Development (USAID), the United States Information Agency (USIA), and others.

As we discussed the topics of critical importance that this consortium should consider first, one quickly rose to the surface. That is leadership. Reform cannot happen without effective leadership. The kind of reform we are envisioning—the building of a more global community—requires a special kind of leadership, for while much of the world is changing, many parts are changing very slowly or not at all. And it is in these parts of the world where the change is most critically needed so that people in these areas can also join as full partners in the world community that is being built and benefit from the growth and progress it will generate.

Circumstances in many parts of the world work against change, most significantly, political circumstances and economic circumstances. That is where leadership becomes most critical—especially leaders who have the ability to work in these difficult circumstances and environments.

For this conference, we have assembled a group of people who have remarkable abilities as leaders in reform. They combine not only vision, task, and inspiration, but they bring other qualities that enable them to work and be successful in particularly difficult circumstances and environments. They are survivors, and they are entrepreneurs. They know that to accomplish reform, they must be able to function effectively in many different circles in their nations and regions: the academic circles, the political circles, the business circles, and the social and cultural circles. They know that reform means change and change requires broad support. They also know that it takes money to institute reform and they have become particularly adept at knowing where to find it, which significantly increases their effectiveness as leaders.

We have invited several of these entrepreneurial leaders to this conference to share their stories, experiences, and lessons as case studies. These speakers—Dr. Dmytro Melnychuk of Ukraine, Dr. C. Peter Magrath of the United States, Dr. Jiaan Cheng of the Peoples Republic of China, Dr. Ladislav Kabat of Slovakia, Dr. Fakhry Shousha of Egypt, Dr. Ramon de la Peña of Mexico, and Dr. Zachary Kasomekera of Malawi—represent many different parts of the world and many different circumstances and environments for reform.

In addition, we are honored to have as keynote speakers Dr. Csaba Csaki of the World Bank and Dr. Richard Foster of the W.K. Kellogg Foundation to provide their global perspectives on world development as well as the opportunities that their organizations present to support development. It is our hope that we can all learn something from each of them that will help us strengthen our own reform efforts in our own nations, reforms that will benefit our institutions but more importantly, reforms that will lead to growth and progress for the people we serve and who rely on us to ensure that they will have an adequate and safe supply of food for the future. For as Woodrow Wilson, one of the architects of the League of Nations, noted some 80 years ago, “Hunger does not breed reform; it breeds madness and all ugly distempers that make an ordered life impossible.” (Speech to the U.S. Congress, November 11, 1918)

That ordered life—today we would call it peace—is, after all, the ultimate goal of what we are doing. It is the goal of the consortium and all of our partners—UNESCO, USAID, the World Bank, the Farm Foundation, and the W.K. Kellogg Foundation—as well as, I believe, the personal goal of everyone here. To achieve peace, we need to institute reform; and to institute reform, we need leaders.

John F. Kennedy said, “It’s time for a new generation of leadership, to cope with new problems and new opportunities. For there is a new world to be won.” (Television address, July 4, 1960) And although I believe those words are still very applicable today, I would offer one small change to what Mr. Kennedy said, and that is this:

**For there is a new world order
to be built. Welcome, dreamers
and builders of our
new world order.**

Ukrainian National Agricultural University Reform Activities: Integration into the World Education System

Dmytro O. Melnychuk

Background

I will start with the quotation “From the world of contradictions to the world of cooperation,” which was the epigraph used by Dr. Martin Jischke in his presentation at the conference devoted to the 100th anniversary of the National Agricultural University of Ukraine (NAUU). I hope these words will serve as the keystone of both this conference and the activities of the Global Consortium of Agricultural Universities.

Great progressive social, political, and economic changes in the world have brought us together as representatives of agricultural universities from all over the world. Our purpose is to develop global approaches to that part of the educational system that directly concerns the provision of food, rational and ecologically harmless food production (including biotechnologies), a healthy lifestyle, and the prevention of destructive impacts on the biosphere.

It is worthwhile integrating the world’s existing educational and scientific systems and informational technologies. The best achievements of each country should be applied to such a global system. In this approach, young generations get more opportunities to participate in advanced educational programs, and scientists can concentrate their efforts on solutions of global scientific problems.

Recently, these critical problems became the main topics at international scientific conferences held in France, the United States, and Russia. In this context, it is quite understandable that Iowa State University, the National Agricultural University of Ukraine and the Humboldt Universität zu Berlin organized an international scientific conference, “Globalizing Agricultural Higher Education and Science: Meeting the Needs of the 21st Century,”

held in Kyiv last year. At this conference, the decision was made to found the Global Consortium of Agricultural Universities, with Dr. Martin Jischke as president.

Dr. Jischke stated, “The main consortium objective is to reform the world system of higher agricultural education according to the most advanced achievements in fundamental and applied sciences and informational technologies, while adapting to the specific conditions of each country’s social and economic characteristics.” This raises the question: Is the goal relevant for today’s conditions and is it achievable?

I belong to those whose immediate answer is “Yes!” And, it is not pure optimism. This answer is based on the existing experience of reforming the activities of the NAUU and the whole system of agricultural education in Ukraine, especially during the last eight years. During that period, our country became a sovereign state and started building a democratic society.

Reform Steps in Ukraine

In the following section, I will present the major results of the reforms we conducted. Let me begin by describing the system of higher agricultural education in Ukraine.

As shown in *Table 1*, Ukraine has quite a powerful system of training experts for agriculture. This system includes 10 universities, 6 academies, 4 institutes, 16 colleges, and 96 technical schools. All of them, except the National Agricultural University, are part of the Agroindustrial Complex of Ukraine. Certain activities of the agricultural education institutions are under the control of the Ministry of Education and the Ministry of Economics.

Table 1.
Agricultural Higher Education System in Ukraine

Type of educational institution	The number of institutions	The number of students		
		Full time training	Training by correspondence	Total
Universities	10	32,896	21,375	54,271
Academies	6	13,850	8,152	22,002
Institutes	4	8,825	5,973	14,798
Colleges	16	12,499	4,252	16,751
Technical schools	96	55,421	19,023	74,444
Total	132	123,491	58,775	182,266

The activities of agricultural education institutions are the responsibility of one of the deputy ministers of the Agroindustrial Complex, Mr. Sergey Melnyk.

Table 2 displays the number of students at different educational stages. Taken collectively, the Ukrainian agricultural education institutions represented in this table train approximately 190,000 students.

The National Agricultural University, which currently trains about 18,000 students, is the largest educational, scientific, and production complex among the higher agricultural education institutions of Ukraine. The university trains younger specialists, bachelors, masters, and specialists in: agrobiological, agroengineering, agribusiness, forestry and fisheries, veterinary medicine, agroecology, land management, and plant protection.

Table 3 represents the structure of the university: includes 13 faculties (colleges), 2 research stations, 2 demonstration farms, 3 regional colleges and 3 technical schools, and more than 20 scientific and research laboratories and institutes. The university has 30,000 hectares of arable land

and forest. When the “Iron Curtain” fell opening access to the countries of the western world for communication and cooperation, the Scientific Council of our university developed a phased strategy for reforming the activities, status, and structure of our educational institution. The process of reform which is still going on, consists of six basic stages.

The first step

Studying the educational systems of the United States, European, and Asian countries and developing cooperative linkages with the leading universities of the world

As shown in *Table 4*, today our university has official agreements with 33 universities in the United States, Europe, Asia, and Africa. These extensive international contacts became possible thanks to financial contributions of many international organizations: The World Bank, the U.S. Information Agency, and the U.S. Agency for International Development; U.S. universities in Iowa, Pennsylvania, Indiana, Ohio, North Dakota, and Minnesota; the Humboldt University (Berlin),

Table 2.
Characteristics of Students from Agricultural Higher Educational Institutes in Ukraine, 1999

Educational stages	Universities	Academies	Institutes	Colleges	Technical schools	Total
Junior specialist	5,904	-	-	15,547	74,444	95,895
Bachelor	21,858	9,074	5,659	1,204	-	37,795
Specialists and Masters	33,386	12,928	9,139	-	-	55,453
Doctoral and postgraduate students	706	199	136	-	-	1,041
						190,184

Table 3.
Main Characteristic of the
National Agricultural
University of Ukraine

Faculties (Colleges)	13
Departments	101
Regional colleges and technical schools	6
Research stations	2
Demonstration farms	2
Scientific and research labs	20
Students including masters	18,152
Doctoral and postgraduate students	330
Specialties	21
Specializations	34

Table 4.
International Relations of the National Agricultural University of Ukraine

<p>United States</p> <ul style="list-style-type: none"> • Iowa State University • Purdue University • Louisiana State University • Pennsylvania State University • Case Western Reserve University • University of Minnesota • University of Illinois (Chicago) 	<p>Poland</p> <ul style="list-style-type: none"> • Warsaw University • Krakow Agricultural University • Shetsin Agricultural Institute • Vrotslav Agricultural Institute 	<p>Austria</p> <ul style="list-style-type: none"> • University of Agricultural Sciences (Vienna)
<p>Germany</p> <ul style="list-style-type: none"> • Humboldt University (Berlin) • Hohenheim University (Stuttgart) • Anhalt Institute (Bernburg) • Dresden Technical University • Hannover University • University of Applied Sciences, Institute of Weihenstephan 	<p>Hungary</p> <ul style="list-style-type: none"> • Debrecen Agricultural University • Godollo Agrarian University 	<p>China</p> <ul style="list-style-type: none"> • Northwestern Agricultural University (Yangling)
<p>The Netherlands</p> <ul style="list-style-type: none"> • Wageningen University and Research Center 		<p>Slovak Republic</p> <ul style="list-style-type: none"> • Slovak Agricultural University
<p>Italy</p> <ul style="list-style-type: none"> • Biophysics Institute of National University Research Center • Perugia University 		<p>Czech Republic</p> <ul style="list-style-type: none"> • Praha Agricultural University
<p>United Kingdom</p> <ul style="list-style-type: none"> • Edinburgh University • Scotland Agricultural College 	<p>South Korea</p> <ul style="list-style-type: none"> • Yonsei University 	<p>Canada</p> <ul style="list-style-type: none"> • Toronto University
<p>Belgium</p> <ul style="list-style-type: none"> • University of Gent • Agricultural Institute, Geel 	<p>Israel</p> <ul style="list-style-type: none"> • International Association "Mashav" (Tel-Aviv) 	

Hohenheim University, and Dresden Technical University in Germany; Gent University in Belgium; Scotland Agricultural College; Seoul University; as well as the European Project TACIS. In conjunction with Iowa State University, our university completed four projects financed by the U.S. government and a number of private individuals in the United States.

Since 1990, over 200 professors and more than 2,000 students from our university visited the above-mentioned universities and obtained practical experience with the agricultural enterprises of Western countries. In addition, we studied curricula of the world's leading universities. We are now researching the options for transforming our educational system in order to borrow the most advanced achievements of others.

It was necessary to change the entire educational system in Ukraine to train experts who were prepared to work under free market conditions. New courses were introduced, and the interpretation of outdated ideological and economic dogmas was changed. New textbooks and didactic materials were published, and new teaching staff was admitted. In total, 158 textbooks and study guides—most of them newly introduced—have been published by our university scientists during the last six years. Due to this work, new catalogs of curricula and syllabi are now available. Perhaps the most important innovation is the new model of continuing education that was developed (see **Figure 1**). This model integrates the best achievements of the American and post-Soviet systems of education. First developed at NAUU, the model is now accepted as the basic one in all 20 higher agricultural educational institutions of Ukraine.

We have been working with German and Belgian universities for years, and our experience shows that the model of continuing education is of great interest for all of us. We are also pursuing cooperation in continuing and distance education with U.S. universities such as Iowa State and Minnesota.

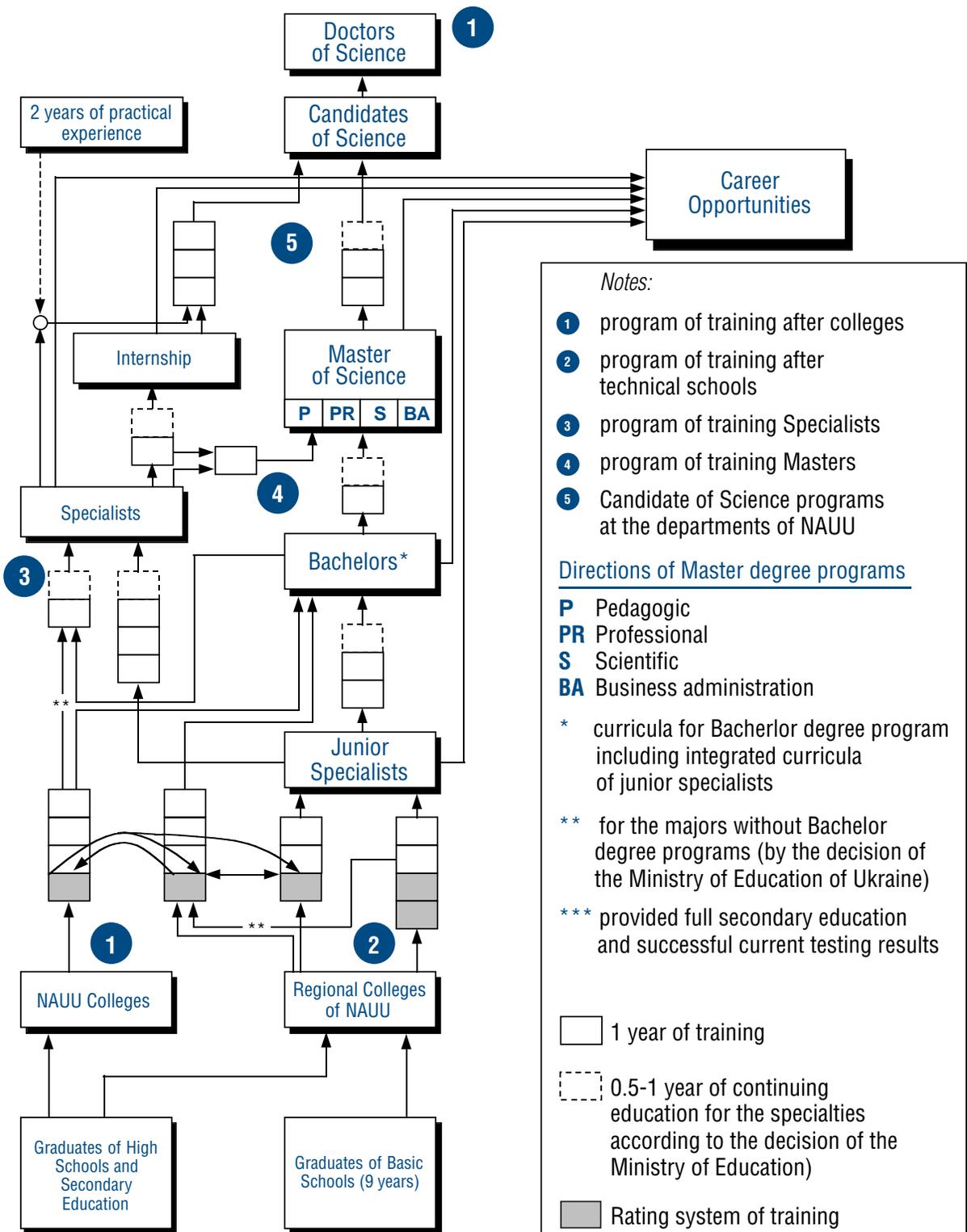
We should thank Iowa State University and the U.S. Information Agency, who sponsored our cooperation for years. These activities could hardly be successful without the assistance of ISU and NAUU administrators working closely with the Ukrainian Government and authorities. As a result, the most important reform items have been introduced into Ukrainian laws about education.

The second step

Providing maximum autonomy and democracy in the university activities regarding personnel management

In 1992, the former Ukrainian Agricultural Academy was transformed into the State University, which reported to the Ministry of Agriculture. Later, in 1994, the Ukrainian Government decided to grant our university national status, and it was included in the Cabinet of Ministers structure. This status is granted to the best universities with the highest rating, awarding such institutions both administrative independence and resources from the state's budget. Experience shows that the government's decision was progressive because it covers our university reforms and entire system as well.

Figure 1.
System of continuing education at NAUU



The third step

Exploring linkages between the university's scientific and educational activities

To reach this goal, university departments and two colleges have been established on the basis of a number of scientific and research institutions. These institutions belong to the Ukrainian Academy of Agricultural Sciences and are independent from the University (see Table 5). They help to provide students with the opportunities to participate in scientific research activities. The university is also developing its own research institutes and scientific laboratories. This is the first positive step toward the integration of education and science, and it is an especially important step for countries in transition.

Our university is establishing a Department of Extension that is intended to strengthen the relationship between university activities and the agricultural sector. This department borrows from the experiences of Iowa State University, the University of Minnesota, Louisiana State University, and Pennsylvania State University. The experiences of such world famous educational institutions in this field are outstanding and well worth studying and applying.

The fourth step

Implementing up-to-date information systems and computer technologies, including distance learning

In pursuing this goal, we have trained a number of our young scholars at universities in the United States and Western Europe. They are working on the development of the university computer network. Electronic versions of lectures and instructional materials are being developed in the University departments. For better coordination of this work, a new position, Vice-Rector for Computer Technologies, was introduced.

The fifth step

Improving university structure and administration

Colleges within one field of science are being transformed into research centers through the integration of colleges, departments, research institutes, scientific laboratories, regional colleges, technical schools, and farms.

Currently, there are eight centers: Plant Production and Agricultural Technologies, Agricultural Business, Agricultural Engineering, Forestry and Land Management, Animal Science, Liberal Arts, Pedagogics, and Advanced Training. Recently, the Institute of PostGraduate Study has been organized. It offers four types of Masters Programs: scientific, pedagogics, business, and professional skills. A presidential form of management is being introduced in which decisions are delegated. This method will enable decentralization and democratization of university administrative and financial systems.

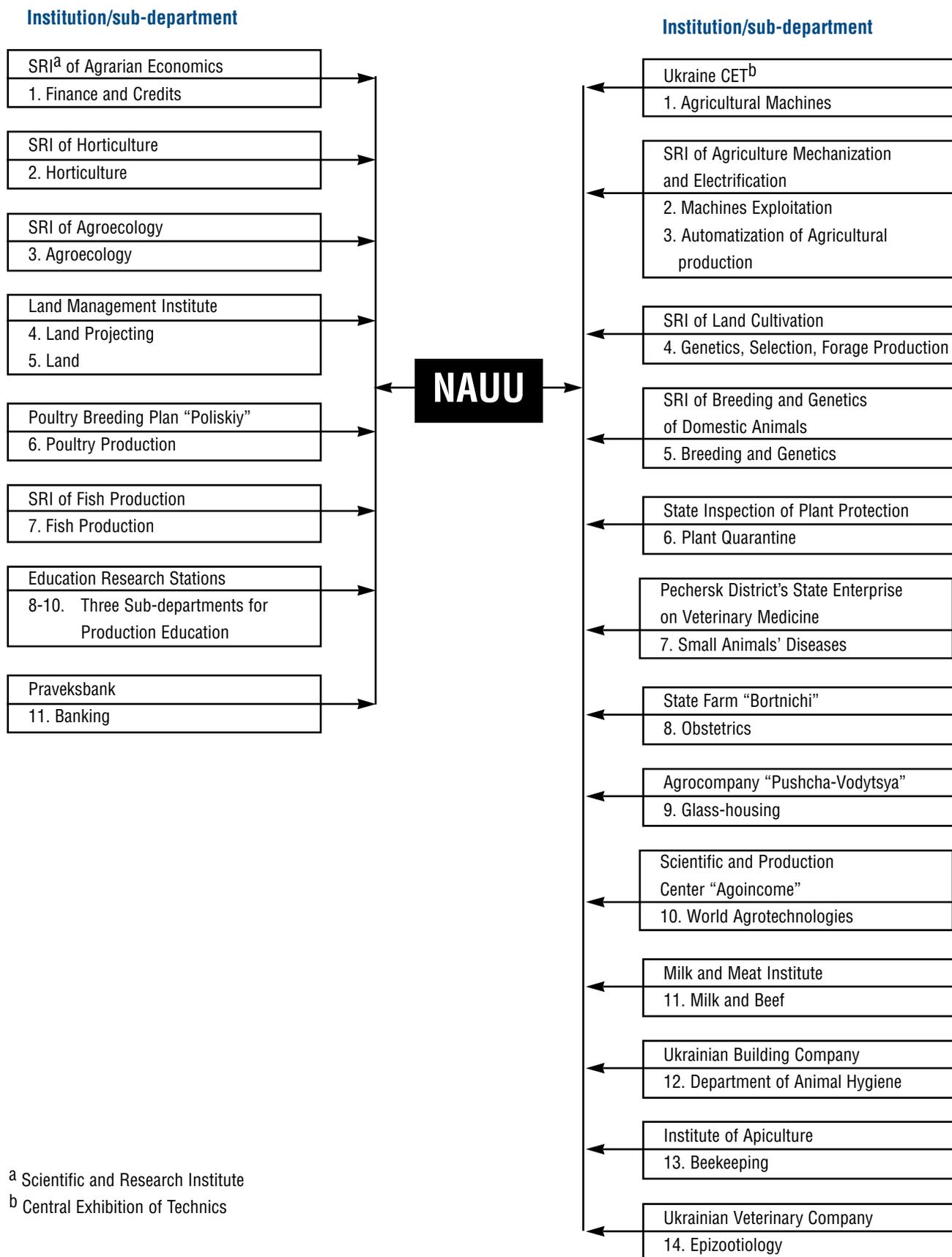
The sixth step

Reforming the system of cooperation between university administration and student organizations

Studying the progressive approaches of the world's leading universities was quite useful in making decisions on these delicate matters. Today, our university has a student organization, a women's association, a student union, a trade union, and a number of public clubs. These organizations help to make the students' leisure time more interesting and diverse, to develop their talents in arts and sports, and to prevent the abuse of drugs and alcohol. Various political organizations and parties are operating on campus according to their own principles. The university, however, is not responsible for their foundation or activities.

One more problem that is rather serious to deal with is the improvement of financial support for university activities. Such support is supposed to be improved through external sources, namely, scientific and training service in agricultural business, participation in international programs, payments for training and so on. Today, this support is over 30 percent of the budget funds.

Table 5.
Integration of NAUU's Departments with Scientific and Research Institutes of
Ukrainian Academy of Agricultural Sciences.



^a Scientific and Research Institute

^b Central Exhibition of Technics

Concluding Remarks

I would like to express once again my gratitude to my foreign colleagues for their valuable contributions in reforming the NAUU and the entire system of agricultural education in our country. I would like to extend special thanks to the President of Iowa State University, Dr. Martin Jischke, and to the Chancellor of the Agricultural Center of Louisiana State University, Dr. William Richardson, whose universities made great contributions during the reform process and in recognizing our educational system. It is hardly possible to express the real value of their support, assistance, and understanding. Our students and graduates will fully realize this value, however, because now they are being admitted for advanced training in the world's leading universities. I am certain this younger generation will further develop international cooperation and recognition.

I recommend that a topic for one of our future conferences be the development of mechanisms for global approaches to the problems of agricultural science. By this, I refer to methods of increasing global food production while dealing with the problems of agroecology, biotechnology, food quality, and so forth. I am certain that the experience of each conference participant will be useful in the development of a new type of cooperation among world agricultural universities, and I am sure that our consortium should serve this idea! I wish that international organizations such as United Nations Educational, Scientific, and Cultural Organization, Food and Agriculture Organization, the World Bank, the European Bank, the International Monetary Fund, and other foundations, organizations, and individuals would support such conference ideas and issues as well as our consortium plans.

As for ways of reaching the goals of our consortium, we should make decisions together during our conference or working group meeting discussions. While determining consortium objectives, structure, and activities, we could refer to the conference proceedings "Globalizing of Agricultural Higher Education and Science: Meeting the Needs of the 21st Century," especially pages 169-171 of that report.

It is essential that our governments as well as individuals should support our consortium activities through international integration and globalization of agricultural higher education, science, and agricultural production. This is a worthy goal for the twenty-first century.

Reforming U.S. Higher Education

C. Peter Magrath

The Scene in the United States

I speak from the United States perspective and inevitably reflect some of my nation's cultural mind-set. I mention this to make the point that I do not wish to prescribe what should be done by universities in other nations, but rather to describe the issues in higher education as I see them for whatever value they may have to other internationally engaged universities. In turn I hope to learn from colleagues from around the world. But I affirm this proposition: all of us are attending this conference because we care about nutritious food and related services for the citizens of our world. And we all recognize that universities have much to contribute toward this fundamental objective. Certainly my nation's prosperity has been built on the development of scientific expertise in the food and agricultural sciences.

Today in United States higher education, many of us believe that change and reform are essential. Yet one might ask, why should we need to reform? After all, it is successful in providing opportunities for an enormous segment of our population and clearly it is effective in discovering new knowledge—through research and extension—and making that knowledge useful and usable. Many of my colleagues like to say, at least to themselves, that our system of higher education is in many respects “the envy of the world.” Whether that is true or not, there is evidence that our system is effective for our country. Why, then, bother with an agenda for reform and change—since we all know how resistant to change most humans are. I suggest three reasons change and reform are imperative in U.S. higher education.

Avoiding mediocrity

The first reason is basic: even when an enterprise is good, resting on one's laurels, and being content with the status quo, is a recipe for disaster. If our public universities and colleges are content to continue their work in the new century as they have performed it in the century now ending, they will be marginalized and slide gradually, but definitely, into mediocrity.

Why? Despite the economic benefit that universities contribute to my nation, resources from both state and federal governments have declined significantly in recent years. This trend is likely to continue, meaning that our universities need to be more imaginative and entrepreneurial in attracting the resources needed to serve the public interest. Relatedly, the very success of universities at times leads to indifference and arrogance as to how those of us in higher education relate our work to the needs of our society, including the attention we pay to undergraduate students. So we must engage in confidence building measures to attract public support and understanding: we must demonstrate that we use all our resources efficiently; show that our faculty are truly productive; and manifest—in the context of the twenty-first century—the value of what we do in the research arena.

Adapting to new technology

The second reason that change and reform are imperative is that technology is having a dramatic impact on how educational services, particularly the transmission of knowledge, are delivered. Let me put this as clearly as I can: what many of us call information technology systems are revolutionizing how we produce and market products and how we communicate and exchange ideas. Universities that do not adapt and creatively use the opportunities of the digital age as characterized by the Internet and the World Wide Web will be marginalized. As much as any other factor, this development of technology which actually is a consequence of research and development done within universities, makes change and reform imperative.

I wish to comment more extensively on this factor, which I label the new world of cyber education. Technology and the new information systems will not replace human interaction of the kind that we are having at this conference, but today, like it or not, we are all globally interconnected. Cyber education and the digital and information technologies are fundamentally affecting—perhaps even transforming—our universities. They are having a huge impact on how we discover knowledge, transfer it to all who can profit from it, and apply it through our outreach to the communities and social and economic interests that we serve. All of the world's universities are going to be vastly changed, and they must take charge of that change.

Clearly, the research process will be transformed as teams of scholars in various disciplines communicate rapidly through the Internet and in other ways, in contrast to the relatively monastic and individualized way in which scholars have traditionally operated. Information technologies also create the potential for new workplaces not limited by traditional institutional boundaries, whether they are businesses or classrooms, libraries or laboratories. Computers and computing are incredible tools that, although not replacing human ingenuity and creative thinking, make it possible to communicate rapidly and to simulate the processes for discovering new knowledge.

Tomorrow's libraries will also be different because of digital technologies, making it possible to move far beyond the communication of the printed word to a world of virtual reality and dazzling communication. Not only will technology make possible new forms of intellectual discourse, but it also will make it unnecessary for every university to stock every possible book and periodical, which has become totally impractical.

The digital and information technology age suggests that universities will become far more learner-centered than faculty-centered organizations, and that they will join in partnerships with other providers from the public and private sectors. Indeed, the results of a new survey of National Association of State Universities and Land Grant Colleges members' investments in information technology document that such shifts already are well under way. Sixty-nine percent of the survey respondents said that adding and upgrading computer capabilities for students was one of their top three priorities for their investments in information technology. Sixty percent cited adding and upgrading equipment for faculty and staff members as among their top priorities, and 45 percent cited integrating new technology in the classroom as a major priority. On average, the responding institutions are investing approximately 5 percent of their operating budgets into information technology. Just as impressive, two-thirds of the respondents now are participating in a "virtual university" or are partnering in some other type of distance education project that relies on information technology to benefit nontraditional students.

Lifelong learning will become a mainstream preoccupation for our universities, because lifelong learning is essential to economic and social development in an information age. The new asynchronous, information technology-driven education makes it possible for all levels of education to be truly interrelated. Interactive and collaborative learning can now be a reality for an infinite number of learners, regardless of the time of the day or their geographical location. We are moving from an age of knowledge controlled by a relatively few masters and specialists to a "culture of learning" in which we are constantly surrounded by and immersed in learning experiences.

Recognizing the impact of globalization

The cyber education revolution contributes to the third major reason we must undertake reforms; indeed, it is why we have come to this conference from all over the world. I refer to the impact of globalization on universities throughout the world. I suggest that there are a number of factors impacting on all universities regardless of their physical location, traditions, current practices, or aspirations.

The first is the fact of economic interconnectedness among nations; every country's economy is impacted by, if not linked with, the economies of countries surrounding it and around the world. The most dramatic illustration of this fact is the proliferation of multinational corporations whose loyalty is tied to shareholders, not nations; their economic impact is transnational. Just as world money markets are linked through such giant banking firms as Deutsche Bank or Mitsubishi, the carmakers of the future are typified by Daimler-Chrysler, and the oil companies by BP Amoco. (In 1998, worldwide corporate mergers totaled \$2.3 trillion.)

The second globalization factor is the world shift toward democracy and, especially, market mechanisms as opposed to "command and control" economic structures. Without going into an analysis of complex developments, I suggest that political systems of representative democracy are more widespread today than was the case twenty or thirty years ago. In China, the world's most populous country, there is a trend toward increased local government power and enormous reliance on market mechanisms instead of a centrally controlled economy.

The third globalization factor is the emergence of consumerism. Certainly in the United States, but also worldwide, there is a trend toward serving consumers' needs and interests, whether in economic products or in government services. The operative philosophy is that the individual comes first. If his or her needs are not served, there will be political or economic repercussions against providers who do not provide—who fail to serve their customers. There are major implications here for higher education: universities increasingly must address and serve the needs of their students as consumers in ways that meet students' interests and convenience, not those of university administrators and faculty.

Fourth, within organizations there is a clear trend to flat, as opposed to hierarchical, organizational structures, joined with the breaking down of disciplinary lines. The idea is to give individuals and small groups more independence and discretion to further the mission of their organization. Small groups within large organizations are increasingly encouraged to work across disciplinary and organizational lines because this is less bureaucratic and more efficient; it releases pent-up creativity too often blocked by rigid organizational hierarchical lines. This trend is evident in business where it poses an enormous challenge for the highly bureaucratic General Motors Corporation; it is evident in banking in the United States where banks and insurance companies are combining in ways that break down barriers in finance. We see this trend also in universities where many educational leaders promote interdisciplinary programs and institutes to encourage professors to work with colleagues from different disciplines. Unfortunately, faculty are typically ensconced in the narrow professional interest of their discipline, to the detriment of the broader mission of the university of which they are at least nominally a part.

The fifth new context for universities includes the physical and biological environment: global ecological issues. These issues leap over national lines but also across university disciplinary lines. Think, for instance, of such issues as the pollution of our air and water, the deforestation of our planet's life sustaining areas, and the complex issues of global warming. A study entitled *Strategies for a Global University* published by Michigan State University in 1995 points out that:

The problems of transnational acid rain, deforestation, greenhouse effect, ozone depletion, and other matters of global ecology have mandated new thinking and action in the public arena. These issues will remain an important agenda for research and public policy. (p.5)

Although difficult to prove, we should recognize a sixth new factor: the emergence of global multicultural values. Many parts of the world, including the United States, are riven with ethnic and racial tensions and fragmentation. But there is also a countervailing trend: a deeper appreciation for the richness represented by the ethnic groups, languages, and racial heritages of the world's population. Moreover, there is an enormous multicultural sports industry—represented by soccer, basketball, ice hockey, and track and field—that cuts across national lines; U.S. universities have played a prominent role in this development, in part because athletics is, for both better or worse, a prominent feature of our universities. Entertainment is much more global thanks to the new information technologies, a trend likely to grow. Appreciating and dealing with multicultural values and issues in the broadest sense is one of the realities of the new global system.

The Leadership Question

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

One of my favorite quotations comes from Shimon Peres, the former Prime Minister of Israel:

A leader must be like a bus driver. Namely, he cannot turn his head all the time backward to see how the passengers feel. He'll make them nervous. You want him to sit at the wheel, watch the road and keep the wheel. We are not in the business of pleasure. We are in the business of leading. (Washington Post, 1995)

And this leads me to an enterprise with which I have been closely associated, joined here by a number of my colleagues, such as Martin Jischke of Iowa State University and Constantine Curris of Clemson University and strongly supported by Vice President Rick Foster of the Kellogg Foundation. It is the Kellogg Commission on the Future of State Universities and Land Grant Colleges. Over 25 state and land grant universities in the United States came together a few years ago, generously supported by the Kellogg Foundation, convinced that they should take charge of change and lead the way to needed reforms due to the changes occurring in America, in the world, and in higher education.

The fundamental assumption of the Kellogg Commission was stated in one of our early pamphlets:

None of us—faculty, presidents, or trustees—can afford to ignore these issues while defending narrow, outdated positions. Basking in the reflections of past glories, we will lose sight of today and risk tomorrow. We have to persuade the American people that we are good enough to lead, strong enough to change, and competent enough to be trusted with the nation's future. In brief, we must take charge of change. (*Taking Charge of Change*, Kellogg Commission, 1996)

This Commission, now approaching the conclusion of its work, is led by chancellors and presidents of leading universities who are committed to working for change within their universities and to promoting the cause of change by working together as a collective “reform club.” These commission members have met often for intense debate and discussion, and they have listened carefully to lay advisors, business leaders, former trustees, and other leading citizens to make sure that they were also listening to the public and the larger society we serve.

The Work of the Commission

I will sketch briefly the actual issues that the Kellogg Commission has engaged and promoted, and that are making an impact on many of our public universities. We have issued action calls that do the following: insist that students, all students, must be put first in the work and mission of our universities; insist that access for as many as humanly possible in our population is critical to the success of our society; and insist that we are in a continuous learning society in which learning through all means possible, including cyber education and throughout life, is absolutely essential to a healthy society and economy. In addition, we will soon issue a report on our university and academic cultures—how they can be changed and modified to reflect the realities of the twenty-first century. We will conclude by issuing a millennium report in March, 2000, charting four or five critical issues and directions that we believe are imperative for U.S. universities.

I have deliberately omitted one report that has been perhaps our most talked about and most successful. It is called *Returning to Our Roots: The Engaged Institution*. It was put together and led by the chair of this conference, President Martin Jischke of Iowa State University.

Although our engaged institutions report comes out of the U.S. context and experience, it may have relevance for the efforts you are making in your universities and your nations. This report speaks from the history and perspective of the U.S. land grant idea of educational service to people, community, and society. And it comes from a marvelous and representative selection of universities, including our historically Black universities, the American Indian tribal colleges, the traditionally agriculturally involved universities, and the urban and metropolitan universities. All of them are public; all are committed to discovering and transmitting knowledge and applying it to meet human needs as defined not only by the university, but also by society. Our engaged university report speaks to our responsibilities and opportunities in the United States and in the world.

We describe engagement as having three characteristics: (1) being organized to respond to the needs of today's students and tomorrow's, not yesterday's; (2) enriching students' experiences by bringing research and engagement into the curriculum and offering practical opportunities for students to prepare for the world they will enter; and (3) putting universities' knowledge and expertise to work on the problems their communities face.

If you have not already done so, look at this report; note the illustrations it provides of successful models of engagement and illustrative examples of the rich opportunities that lie before us in the twenty-first century.

The Commission's engaged institution report is not a single road map, but a number of road maps, insisting that the leading and most useful universities of the twenty-first century will be those that expand their engagement with society. They will do so by providing educational expertise and service to communities in partnerships involving other organizations and interests. Their engagements will provide rich opportunities for students to learn and for faculty to teach effectively through internships, community-based projects, and activities as varied as the human imagination.

In addition, this engagement will provide opportunities for faculty to gather data in new arenas, leading to new results and the expansion of their own learning. Ultimately, of course, true engagement in the university of the twenty-first century will not occur unless the boundaries of academic disciplines erode in ways that facilitate inter- and multidisciplinary work by university teachers and researchers. Nor will it happen unless administrators reward faculty members' involvement with their communities in the real currency of the realm: status and salary. The obstacles and barriers may seem formidable, but they are not insuperable.

Over time, our universities have always responded to the needs of the society: transforming a rural nation into an industrial one, serving the national interest during the Second World War and the long Cold War, and helping transform the United States and the world into a knowledge—and information—driven society. Readapting the land grant philosophy as engagement in partnerships with the community and, more broadly, with the society is the right thing to do. It is also the smart thing for universities, which need to attract the continued resources required for their fundamental mission of discovering, disseminating, and applying knowledge. The focus on engagement by the Kellogg Commission's 25 presidents and chancellors of public-serving universities points in the right direction—toward the millennium we are now entering.

Reform Within Agricultural Universities

What does this U.S. effort have to do with this conference? It is relevant to our efforts to organize and work together on behalf of an overriding common good: good food for the people of the world. The Kellogg Commission reform effort is an important illustration because agriculturally engaged universities are among the most important, not only in my country but throughout the world. It is not a coincidence that the overwhelming number of universities in the Kellogg Commission are agriculturally engaged universities, which we call land grant universities. Originally, many of our public universities were built around colleges or facilities of agriculture, but these have diversified and expanded into multipurpose universities in response to social needs. They remain vital for a simple reason: because food is critical. Where food production and distribution are neglected, society suffers, and there is no economic development.

Reform within our world's agricultural universities is important, not only for the reason I have just stated, but because these universities have the capability of being, literally, leading lights for all universities and their work which ought to be to serve society.

Agricultural universities have always had a practical orientation of helping to produce food and furthering its distribution; this has been the case in my country where our agricultural universities in the century now ending have revolutionized food production.

But if these universities are to lead the way by exemplifying the importance of developing products and promoting education that benefits society, they must overcome a double challenge. First, they must step out of the shadow of prejudice and victimization that has often been directed at them by many who represent elite scientific universities. At least in the United States, there has always been a perception that the study of agriculture and food—the preoccupation of our land grant universities—is a nice and wonderful thing, but not quite deserving of the respect that we attach to quantum physics, molecular biology, or the study of philosophy. I disagree, believing that all academic and educational endeavors are equally important and worthy of respect if they help educate men and women and if they help, one way or another, to serve social needs and interests.

The second challenge to be overcome is that too often our agriculturally engaged leaders, reacting to the prejudice and isolation they have encountered, have isolated themselves. They have become too parochial and ignored forging alliances with other interests in our society (such as those who are based in urban areas). In a sense, they have become complacent, an attitude made easier by the fact that they have had a reasonable stream of guaranteed funding from our federal government through various programs administered by the United States Department of Agriculture. Too often our agricultural universities have been content to be isolated and left alone, drawing on the resources available to them through certain formula funding programs, which unfortunately have been seriously eroding in recent years.

It is for these and other reasons that a number of significant initiatives and questions are being raised by leaders of our agriculturally involved universities and their allies and friends. The Kellogg Commission is, of course, a major reform project that addresses some of these issues. But I also want to emphasize another major initiative of the Kellogg Foundation: the Food Systems Professions Education initiative intended to help our agriculturally engaged universities plan imaginative, new

ways to promote and improve food systems education. This initiative, which is represented at this conference by a number of agriculture and food systems leaders, promotes not only innovative thinking but new collaborations among higher education, communities, and business partners.

This Food Systems Profession Education initiative is deeply concerned about the health of the world food system and the interrelationships that must be developed among science, economics, social, and political dimensions so that a global food network can be developed to meet the complex needs of the twenty-first century. This initiative relates directly to the fundamental assumptions underlying the larger reform movement of the Kellogg Commission that I have described. As a consequence of these realities, my association has committed itself to examining the challenges for agriculturally engaged universities in the twenty-first century. We will do this by developing a rationale for a major new investment in agricultural education tied to the vital need to improve health care by having healthy food, enhanced nutrition, and improved food safety—if you will, a preventative approach to disease and health problems. This initiative will also focus heavily on international agriculture because we believe that the United States has to work cooperatively and collaboratively with other universities and nations to address the serious problems of malnutrition in our world—a world that is an interconnected global economy.

Finally, we believe that none of these initiatives can succeed unless we strike the right balance with the environment so that agriculture and forestry can be major contributors to a knowledge base that preserves and enhances the environment and the quality of life beyond simply providing food and fiber. We must all work to maintain open green space, reduce the pollution problems caused by certain kinds of agricultural production, maintain the biodiversity essential to our world, and conserve energy sources. These are large challenges and an ambitious agenda. But I have no doubt that dedicated educational leaders from our agricultural universities can accomplish these objectives, just as universities have often accomplished daunting objectives.

Reform: The Ultimate Social and Environmental Sensitivity

In short, the reform agenda applies to each and every one of us at this conference, regardless of our different cultures, university systems, and specific circumstances. We are, for better or for worse—and we must make it for better—in a global and interconnected economy. The Kellogg Commission and the Food Professions initiative that I have described believe that visionary leaders, men and women who are willing to step forward and step out, can bring about change.

If it does not start with individuals such as those of us at this important conference, change will not happen. I believe that we all still retain the idealism that originally got us involved in university work. I ask, what can be more important than having a strong network of agriculturally engaged universities throughout the world, despite differences in our political systems, committed to the proposition that nutritious food distributed to all the people is a fundamental social and moral good? And who more than agricultural universities are better positioned by their commitment, experience, and idealism to provide this leadership, and therefore not only accomplish an immense social good but also bring the necessary prestige and recognition to their efforts.

Those who know me know that I am probably the least likely person imaginable to identify myself with Karl Marx. But running through my mind are a couple of the famous lines in his 1848 Communist Manifesto in which he exhorted the workers of the world to unite because of the proposition that the only thing they had to lose was their chains. Let me reformulate, at this conference of global agricultural universities, what I will immodestly label as Magrath's Manifesto:

*Agricultural universities of the world unite!
You and the world you serve have much to gain!*

Agricultural Higher Education in China: Challenges for the Twenty-First Century

Jiaan Cheng

With the twenty-first century imminent, more and more people are thinking about how to produce enough food to meet the requirements of an increasing population. Using energy and environmental resources fully yet sustainably is an important issue. At the same time, people are beginning to realize that agricultural development could solve these problems, because agriculture is a principal way to produce farm products, such as food, on which people rely for existence. In developing countries, most people live in rural areas and their primary job is farm production. Furthermore, agricultural development directly influences the sustainable utilization and development of resources, energy sources, and the environment. Setting up an agricultural system of modern and sustainable development will thus help to guarantee economic and socially sustainable development. In short, agriculture will play a decisive role in the upcoming century.

With the coming of knowledge-based economics, agricultural development will depend on the development of science, technology, and education. To adapt the agricultural education system to fit the requirements of agricultural development, it is necessary to review the history of development in Chinese agricultural higher education in the past century, to understand our future tasks, and to explore approaches for the development of agricultural education in higher learning.

A Survey of the Contemporary History of Agricultural Education

Contemporary agricultural education in China started around the end of the nineteenth century through the early 1920s. The first two schools of agriculture were called Zhejiang Can Xue Guan (school of sericulture, founded in 1897 and later called Zhejiang Secondary School of Sericulture) and Hubei Wu Nong Xue Tong (agricultural school, founded in 1898). Agricultural education was officially included in school systems after the Qing dynasty government promulgated a charter called Zhou Ding Xue Tang (official school systems) in 1903. Henceforth, in each province appeared primary, secondary, and higher learning schools of agriculture. In Zhejiang Province, a teachers' school was set up in 1910 to provide training for teaching staff from the primary and secondary schools of agriculture. The first agricultural institution of higher learning (the forerunner of China Agricultural University) was set up in October of 1905 and began to recruit new students in 1910. During the early years of the Republic of China (1912-1949), Northwest University (1913), Southeast University (1914), Jingling University (1914), and Lingnan University all provided agricultural courses.

Before New China was founded in 1949, agricultural education in China mainly had followed western systems, such as those in the United Kingdom, the United States, Germany, as well as Japan. Statistics from 1949 show that there were a total of 48 agricultural schools of higher learning throughout the country, of which 19 programs covered farming and forestry, and these schools had 10,726 full-time undergraduate students, 20 graduate students, and 937 teachers.

The Agricultural College of Zhejiang University originated from the teachers' school (1910) and was officially named the Agricultural College of National Zhejiang University in January 1929. In July 1952, to further agricultural development and speed up the training of agricultural specialists, the central government began restructuring higher learning institutions all over the country by separating agricultural education from the comprehensive universities. The government set up new schools providing only agricultural education in regional areas; by the beginning of 1953, there were 16 of these programs.

But with the development of agriculture, agricultural production became more and more dependent on the liberal arts, engineering, economics, and similar disciplines. Therefore, since the 1960's, agricultural schools developed themselves toward being multidisciplinary universities. The number of programs they offered reached 71 and included agronomy, horticulture, plant protection, husbandry, animal medicine, agricultural engineering, food processing, agricultural economics, environmental resources, and the biological sciences.

Zhejiang Agricultural College was reestablished based on the Agricultural College of Zhejiang University in October 1952, and was enlarged and renamed Zhejiang Agricultural University in 1960. In September 1998, it was merged back into Zhejiang University with Hangzhou University and Zhejiang Medical University.

After a century's work, agricultural education in higher learning has developed well. According to statistics from the State Ministry of Agriculture, in 1997-1998, there were 62 agricultural colleges and universities in China, including 4 teachers' colleges of agricultural technology, with 179,875 full-time undergraduate students, 7,169 graduate students, and 24,794 teachers. Since New China was founded, these colleges and universities have trained over 700,000 students as agricultural specialists who have made great contributions to the development of agriculture, to rural economics, and to the modernization of agriculture.

Challenges for Agriculture in China

China is an agricultural country with little arable land and a very large population. Therefore, the farming of rural areas plays a decisive role in social and economic development. As the next century approaches, agriculture in China is facing the following severe challenges.

1. **Large population and few natural resources.** For each person in China, there is only one-third of the required land supply and one-fourth of the water resources compared with the worldwide average. Therefore, the primary job in China is to produce enough farm products to meet the requirements of an increasing population with only meager natural resources.
2. **Multiple targets.** As people's lives improve, their consumption level also increases. Their requirements for farm products change from quantity to quality and a demand for diversified products. On the other hand, farmers' enthusiasm for farm production is dependent on their income, and small-scale farmers are the major agricultural producers in China. Therefore, raising proportional profits for farm production and increasing farmers' income while satisfying consumers' demands is becoming a major focus in our consideration of rural areas.
3. **Rural development as a whole.** Over 70 percent of the population in China live in rural areas. With labor productivity increasing, more workers will move away from farming and change to other work. This movement will inevitably bring social problems to cities, however, as a large labor force relocates from rural to urban areas. Therefore, it is necessary to develop agricultural production suited to a new industrial structure, and to develop secondary and tertiary industries related to agriculture, which will attract workers to county and township areas.

4. **Sustainable development.** Building intensive and sustainable agriculture is the target of modern Chinese agricultural policy. While achieving high production, high quality, and high profits, there must also be a concern for resources and environmental protection. Natural resources should be used rationally and ecologically for sustainable economic and social development.

The discussion of these four challenges shows that the development of Chinese agriculture is strongly dependent upon the way in which farmers interact with their rural surroundings and how social and economic developments are integrated with natural resources and environmental protection. Therefore, the government has proposed a policy called revitalization of agriculture through development of science and education.

The Reforms of Agricultural Education in Higher Learning

Agricultural schools of higher learning are currently reforming their targets, structures, and functions to fully adapt agricultural education in higher learning to the requirements of the latest scientific and technological developments. The adjustments will provide better service for the development of agriculture and of rural areas. This section describes four targets of the educational reform policy.

To further full-scale quality-oriented education

The main point of agricultural education reform in higher learning schools is to change the pattern of personnel training in order to further full-scale quality-oriented education. The traditional pattern of personnel training was to train students to be professionals with a good knowledge in a specialty. Curricula were arranged according to specialty and students were taught mainly through lectures. However, the development of science and technology coupled with economic development demands that more emphasis be placed on the training of innovation and creativity. Far into the next century, China will be a society where agricultural, industrial, and knowledge-based economics co-exist. And the resource of qualified personnel will become a main element in promoting the social economics of a three-part economic structure. Therefore, to succeed in this target, it is necessary to adjust and reform education at every step.

Reforming the curriculum system

The setting-up of the curriculum system is a key step by which the target of training qualified personnel can be accomplished. New curricula are developing based on intensified basic theory, broad knowledge, emphasis on practical ability and multi-disciplines, and improvement of all-round abilities. These new curricula include eight components: ideological accomplishment, knowledge of humanity, physical conditions, practical ability, scientific theory, professional knowledge, knowledge of related disciplines, and technical skill training. The first four components emphasize the basic humanities and the second four emphasize the basic sciences. The reasonable arrangement of the components will guarantee the training of students with broad, quality-oriented abilities.

Improving education and teaching methods

Teaching methods are the ways of carrying out curricula, which directly influence the effects of knowledge transformation. Using heuristics and discussion in teaching, will reduce the time used in the classroom and add to time out of the classroom. These methods will stimulate students to think independently and increase their creativity, let them experience and understand the process of how knowledge develops, and train them to have both a scientific and an innovative mind. For this reform, the central government will increase its investment to improve laboratory and library facilities and to develop computer network systems. Then, students will develop their own abilities of collecting and dealing with information, of obtaining new knowledge, and of analyzing and solving problems through full use of various resources and a computer-aided teaching system.

Strengthening practical teaching links

Practical teaching is an important link not only in examining the exact results of curriculum systems and teaching methods being used, but also in training the abilities of innovation, experience, and creativity. Practical teaching links include teaching practice, scientific research, technical development, extension activities, and social services. The contents of experimental curriculum systems will be reformed and new teaching practice systems will be established to train operational ability according to specialty or discipline. The “advisor’s system” will be adopted to provide environments in which students will take part in scientific research activities and train their innovative abilities. Experimental bases will be set up to offer opportunities for students to join in social activities and to induce a spirit of cooperation and unity.

To adjust specialty and discipline structures

Specialty structure depends on a school’s understanding of the requirements of scientific and technological development as well as on the practical situation of their discipline construction and teachers. Therefore, scientific, technological, and economic development, the setting-up of specialty structure, and the ability to run a school are all dependent on each other. Agricultural schools of higher learning must continually adjust their specialty structures, strengthen their disciplines, and improve their ability to run schools according to the latest scientific, technological, and economic developments.

Continuing specialty adjustments

During recent years, the number of specialties in agricultural schools of higher learning has been reduced to 16. Areas of professional specialties now include agronomy, horticulture, plant protection, sericulture, tea science, animal science, animal medical science, agricultural economics and management, and agricultural resources and environments. Some of these, however, are still too specific to a narrow technical area and should be further adjusted.

Developing comprehensive universities

Agricultural schools of higher learning in China have already been developing from colleges toward being multidisciplinary universities since the 1960s. In recent years, important points of the reform have been to enlarge the scale of school administration, to intensify different disciplines overlapping each other, to raise resource utilization, and to build the schools into comprehensive universities. An excellent example of this reform is the new Zhejiang University, now the largest University with the most diversified scientific and technical disciplines in China, created by combining Zhejiang University, Hangzhou University, Zhejiang Agricultural University, and Zhejiang Medical University. Combining Zhejiang Agricultural University into Zhejiang University has merged agricultural education into the comprehensive university, allowing attention to all disciplines, especially biotechnology, information technology, and materials science, and improved the basic level of agricultural specialties.

Intensifying the study of the environment and sustainable development

The environment and sustainable development is a critical problem for the next century. In a big country such as China, with a large population and limited natural resources, guaranteeing the sustainable development of the environment and resources is an important issue. The sustainable development of agriculture is the basis of social and economic sustainable development. Therefore, it is necessary to intensify the study of environmental education and sustainable development, and to set up specialties related to those topics.

To combine education with science, technology, and economics

Agricultural institutions of higher learning are the main forces in developing agricultural science and technology as well as agricultural economics. The three basic problems institutions must address are qualified personnel training, scientific research, and social services. To advance education in economics, science and technology, schools must make necessary adjustments to their organizational and management systems.

Setting up systems adapted to scientific and technological innovations

Adjusting the organizational structure of agricultural schools of higher learning will require setting up a system with departments, research units, development units, and entrepreneurs working together. Departments will be responsible for undergraduate education; research units will conduct graduate education and scientific research; and development units will oversee the development and extension of scientific and technological achievements. Finally, entrepreneurs will cooperate with, or buy out, the achievements from the development units and turn them into products on a large scale, if it is profitable. Usually, entrepreneurs will be situated off-campus but within the high-tech development zones, which will ensure the execution of the three functions: education, scientific research, and social service. Entrepreneurs will thus form a close link with higher learning schools and their local economies.

Strengthening the combination of industrial circles, schools, and research institutes

Another task will be to further the combination of schools of higher learning with industrial circles and research institutes. This includes encouraging entrepreneurs to set up research units in higher learning schools and having these schools establish practice bases with entrepreneurs. Through various means, higher learning schools will join with entrepreneurs to speed up and extend scientific and technological achievements to entrepreneurs, improve technological innovation, and develop new economic growth points. At the current time, the “Dandelion Project” has been proposed by Zhejiang University and supported financially by the government and enterprises. Postdoctoral stations are already set in some cities or enterprises. Based on research demands and technical needs of enterprises or governments, the University will select graduates with suitable backgrounds and send them to work at these stations where, with help from advisors, they will solve problems or turn their own research achievements into products. The graduates may stay in these positions and become key managers or researchers after they finish the projects in the postdoctoral period.

Adjusting the layout of agricultural schools

Agricultural schools of higher learning are divided into three types according to the way they function within the whole country. The first type is the key national schools of higher learning that are the centers of agricultural education and scientific research for the entire country. They are the basis for basic and applied research in agriculture and are the training centers for postgraduates. The second type is the key regional schools of higher learning that are the regional centers of agricultural education. These schools provide agricultural science and technology and rural economic services for their respective areas. The last type is the provincial teaching schools of higher learning which are the centers of provincial agricultural education and scientific research. These schools primarily provide training to skilled personnel from their own provinces. Reasonable layout of these levels will help form a system of agricultural education of higher learning adapted to agricultural and rural developments.

To globalize agricultural education in higher learning

Since the reform and opening policy began, agricultural schools of higher learning in China have strengthened their ties with schools in other countries, not only by inviting foreign experts to China for visits and to lecture, but also through sending Chinese abroad for visits and study. This exchange has included establishing official ties with other institutions. Zhejiang University has established formal relationships with over 100 universities and institutes in foreign countries. With the globalization taking place in science and technology and in economics, education will surely experience globalization as well. Agricultural education in higher learning in China is also quickening its step to realize educational globalization.

Intensifying Ability Training in International Exchange

The globalization of science, technology and economics demands a new requirement for the training of skilled personnel: Ability Training in International Exchange. To meet this requirement, schools will add optional courses to their curricula, that will let students learn more about the culture, science and technology, economics, and politics of the whole world. At the same time, offering English lectures and courses and improving the Internet system will better train students in foreign languages and computers. In addition, Chinese students can participate in exchanges with students in foreign countries, as well as attend lectures, through the Internet.

Setting up an alternative training program of skilled personnel

To further intensify educational globalization, the “Sandwich Program”, an alternative training program for skilled personnel, should be carried out. For undergraduates, after two years of study and based on financial support, the best students will be chosen to study abroad for one to two years; then, they will receive their academic degrees in their home country. Graduate students who have completed their studies can go abroad for research on their thesis, and then defend their thesis in their home country. To extend this training program, we need to exchange students with schools in other countries and arrange for reciprocal coverage of expenses.

Enhancing international cooperative research

For many years, Zhejiang University has attached great importance to internationally cooperative research. The University has a very good relationship with international institutions, schools, and scientific and research units such as the Food and Agriculture Organization of the United Nations, the International Atomic Energy Agency, the Rockefeller Foundation and the International Rice Research Institute, among others.

To further intensify international cooperative research, Zhejiang University attracts foreign experts to China to carry out cooperative research work by setting up national key laboratories and engineering centers. Similarly, it will encourage its professors to go abroad and establish cooperative relationships with schools where they can carry out their cooperative research work as well.

Conclusion

In the new century, agricultural schools of higher learning must serve the developments of agricultural science and technology and rural economics, and must further their own evolution based on the developments of agricultural science, technology, and rural economic construction.

The Slovak Agricultural University in Nitra: Successes and Failures in a Period of Transition

Ladislav Kabat

With the Communist takeover of Czechoslovakia on February 25, 1948, the country lost its historically developed democratic character and was forced to join the block of countries under the full political and ideological control of the former Soviet Union. The end of the country's political sovereignty was also the end of the whole system of democratic and historic achievements gained during the democratic past. The new Communist regime took strong measures to avoid any resistance or disobedience toward its organs and its ideology. The educational system as a whole became one of the first targets of the party's attention. Hundreds of highly qualified university professors and researchers, particularly those in the humanities, lost their jobs; many of them were sent to jail or labor camps. Shortly after 1948, the Czechoslovak University system was broken and forced to adopt the new scheme and to follow the Soviet pattern. The country's educational system began to lose its historical and democratic identity. This process of deterioration went on almost two decades until 1968, the year in which the Prague Spring brought new hopes for a politically more tolerant environment.

What Has Happened

Since 1948?

There are several key moments and key issues in the history of the Czechoslovak educational system, which should be particularly mentioned. Shortly after 1948, the university system became one of the most important targets of the new Communist regime. Under the direct guidance of Soviet "experts," the "restructuring" of the Czechoslovak higher education system began. The main goals of these offensive and disruptive changes were to weaken the public role and the social prestige of the universities and to minimize their expected resistance against the new government. In line with the Soviet

model, the university activities were split into two parts: university education and science and research. The latter—science and research—was withdrawn from the university system and moved under the umbrella of the newly created Czechoslovak Academy of Sciences. With this move, university education lost not only important funding but also its most important academic driving force—the large number of graduate students. University education without an adequate research component and without support began to lose its quality and international competitiveness.

Following the political changes in February 1948, our university system lost its academic and organizational independence. The traditionally elected university and faculty representatives (rectors and deans) were selected and appointed officially by the government. The negative interference with university responsibilities was felt also in the new admissions policy. The government decided not only on the total number of students for different academic fields but also on their social structure. There was strong favoritism shown for applicants from the working class and party members' families. The personnel policy, as well as the hiring and promotion of university staff were also under the control of the government.

The university curricula, mainly in the humanities (philosophy, sociology, ethics, esthetics, history, and languages) were the focus of government "attention." Strongly reduced and one-direction-oriented Russian language training isolated our younger generation from the rest of the democratic western world after several years. Classical economic education and economic theory were completely removed from the university programs and were replaced by the pseudoscientific utopia of the centrally planned economy. By the mid 1960's, the Czechoslovak university system was almost completely reshaped according to the government and party directions.

A Period of New Hopes and Disappointments—the Prague Spring

The mid 1960's, however, meant not only the proclaimed “successful” final stage of building the socialist society in Czechoslovakia but also the mobilization of the internal political quasi-opposition forces. The political movement for “socialism with a human face” led by Alexander Dubcek gained broad support throughout the country. This movement was particularly welcomed and supported by our universities and other academic institutions. The period 1965-1968 could be considered as one of the most promising historical periods in the postwar history of Czechoslovakia. There was partially improved freedom of speech, increased possibility for travel abroad, and chances for academic cooperation with foreign institutions—all this was a new phenomenon in our country. Significant changes took place in the position of the church. The Czechoslovak society was looking ahead with high expectations.

However, the well-known Prague Spring ended very soon. The Soviet military force, with some local support, turned this great development back. The political protagonists of the Prague Spring were removed from the public scene. Similar to the political development in 1948, the universities again became the party targets in the so-called “normalization process.” Between 1968 and 1970, hundreds of university professors, scientists, researchers, as well as writers, artists, and many other professionals, lost their standing and even their jobs.

And the historical repetition did not stop there. The political and economic development between 1969 and 1989 was very similar to that which the country had undergone twenty years before. The period of normalization brought to our universities additional strong cuts into their democratic rights: strong control over the freedom of speech, control over personnel policies and permanent interference with education and research programs. Our universities operated under this environment for almost two decades, until 1989. The international working contacts and cooperation programs with academic institutions in western countries were strongly limited and, in the case of humanities and economics, practically liquidated.

The “Velvet Revolution of 1989” and the Reform Process

New hopes for our society and also for our academic institutions appeared again in 1985-1986 with Mikhail Gorbachev's policies of “perestrojka and glasnost”. The society, including its academic institutions, was full of expectations and hopes for further political alleviation. The collapse of the totalitarian governments in Central and Eastern Europe became the generally expected event. It was apparent that not only the communist regimes with their ideology, but also the centrally planned economies, failed to compete with the rapid technological and economic development in democratic western countries. The arguments justifying the centrally planned economy were rejected by the vast majority of people in these countries. The desire to change the political system in our countries was extremely strong and was broadly supported.

It was in this social and political environment that the November, 1989 “velvet revolution” occurred, and Czechoslovakia was thrust onto the international scene again after twenty years. Within several weeks the whole political system, based on the dominant role of the Communist party, collapsed. Our society was politically and ideologically free. After twenty years Czechoslovak universities and their academic communities got the chance to take over responsibility for their institutions. This was a great challenge, but also an immense responsibility. The expectations of our people were very high. The market economy was viewed almost as a conjuring tool for the rapid improvement of our life. Our people expected not only freedom of speech and freedom to travel abroad, but also better social and health care, better housing, and higher salaries. Our universities did not lag behind; they expected better financing of their educational and research programs, new laboratory equipment, new modern libraries, better living and working conditions for their students, higher salaries for the staff, and greater recognition for their work. Too much? Too much!

General Agreement on University Reform

Late 1989 was a period of excited public political meetings, discussions, and polemics on how to cope with this new political and social situation. There was no experience to suggest what the sequence of political and legal steps could or should be. One of the first problems for our universities was to abolish the old, politically inclined management and to elect new university leadership. There was a strong determination across the country to build up a new, democratic university system. The goal was defined rather clearly, the expectations of the academic society were very high, and the determination of students and university staff to support revolutionary changes was high as well. Under this environment, I was elected to the highest academic position of my university.

Shortly after the new university leadership assumed their managerial positions, we identified the main goals for our work as the following: (1) to support the democratic changes in society and to reestablish the role of the university as an independent educational and research institution and a center of excellence; (2) to evaluate critically and redefine all the educational and research programs and develop their new structure and new content; and (3) to reestablish the links with foreign universities in democratic countries and to bring our university back into the world academic community.

These key goals were publicly presented and discussed with our university community and with our colleagues from individual departments and colleges. There was quite broad support and almost general consensus on what to do. However, we did not have the experience or clear ideas on how to implement these goals. The old communist legislation which was still in place, made the intended goals almost impossible to achieve.

The New Higher Education Act

Widespread discussions were held, devoted to the preparation of new higher education legislation. The main goal was to replace the old Higher Education Act of 1980. In the period from February to April 1990, several drafts of the new Higher Education Act were considered. The Federal Assembly officially adopted the act on May 4, 1990, and it entered into effect on June 1 of that year.

The new act codified the basic academic rights and freedoms of universities. Unlike the previous acts, this one enabled universities to decide on their internal structure, the content and organization of academic programs, the staffing of faculty positions, and the number of students. According to the act the newly constituted bodies competent to decide these issues were the elected academic senates of individual universities and faculties. The other important bodies functioning at the higher education institutions were Scientific Councils, whose members were appointed by the rectors or deans, subject to approval by the institution's academic senate. The role of the Ministry of Education was reduced to the creation of the conditions necessary for the development of higher education institutions. The Accreditation Board and the Council of Higher Education Institutions were also established at this time.

The Higher Education Act gives academic senates extensive power to make decisions on the internal affairs of the institution. Under the law, the rector is elected by the Academic Senate and is a representative of the university. He is accountable to the Academic senate of the institution and in some limited aspects to the Ministry of Education. However, the provision of the act that gives rectors and deans only an advisory role in the Academic Senate is problematic. This platform weakens the rector's position in the administrative hierarchy of the institution.

At first sight, the Higher Education Act is fully democratic and offers our institutions full self-management responsibilities. However, the practical aspects of managing the university under this legislative scheme are extremely complicated and inefficient. To be able to provide real university leadership is questionable. The problem is linked to the definition of a legal entity and, consequently, to the authority to decide on the internal matters of the university and/or faculty. According to the University Law, both the university and individual colleges are defined as legal entities. In practice, this means that their representatives—rector and dean—are entrusted with full authority to act on behalf of their respective legal entities—university and the faculty. There is no clear definition of “internal matters,” which opens the broad and subjective interpretation of this concept. Based on our experience, however, it is clear that interests of these two entities do not necessarily coincide, and may even differ significantly. Shortly after this legislation came into effect, problems linked to further development and restructuring of the University system became extremely complicated. University leadership has no decision-making authority to coordinate development activities of the individual colleges.

All matters regarding personnel, number of students, academic programs, research and extension activities international cooperation, and so forth—all these activities—are carried out in a more or less isolated manner by individual colleges. Despite the fact that the new Higher Education Act clearly has a democratic spirit, its long-run impact on the development of our higher education system is negative. For the time being we have missed the chance to create real university institutions and, consequently, the real university environment.

Academic Programs: Our Priority

Despite the problems with the legislative framework, the main attention of the university leadership, from the very first days, was concentrated on the university education and research activities. There was no doubt that this area represented an immense complex of problems. The inherited, old university structure and educational programs had to be changed significantly according to the needs of the struggling democratic society.

Prior to the 1989 political changes, the Slovak higher education system was especially designed to serve the country’s political and economic systems. In line with the basic dogmas of the political economy of socialism, there was a permanent emphasis on technical education. The humanities, including language training and sciences, represented a relatively small part of the university programs. Economic education was also a relatively minor part of the curriculum. Education about production agriculture was relatively more important in the curriculum. Basic information on the Slovak higher education system in 1988 is shown in *Table 1*. The structure of the higher education system was fully defined and controlled by the Ministry of Education. Also under its authority were quotas for the number of students at individual university institutions and in individual academic fields. University funds were distributed according to those quotas.

Following the 1989 political changes, however, it was clear that that we had to change not only the structure of the university system, but also its content. There was an urgent need for fundamental changes in our curricula. The educational programs designed in the past were heavily infiltrated by old-fashioned and ideologically strongly biased subjects. For example, subjects in the humanities—such as socialistic philosophy, marxist economy, scientific communism, atheism and atheistic philosophy, and some others—were still an organic part of the academic programs. In a very short period, all of these subjects have been completely excluded from the academic curricula by rector’s decision.

Table 1
Structure of the Higher Education System in Slovakia in 1988

Group	Number	Humanities	Technical	Economic	Agriculture	Art
Universities	13	3	5	1	2	2
Colleges	43	13	17	5	5	3
Students	48,543	15,413	22,952	5,211	4,501	466
Students %	100	31.75	47.28	10.73	9.27	0.96

With the abolition of these subjects, which represented approximately 15-20 percent of the entire teaching load we immediately opened space for introducing a new and much needed university education in modern market-oriented economics. The first university course in macroeconomic theory in Slovakia was offered in Nitra at the beginning of 1990. Thanks to our active contacts with the special section of the Peace Corps operating in Czechoslovakia, we managed to bring to Nitra several young graduate students (in economics) from U.S. universities. With generous support of the United States Information Agency (USIA), United States Agency for International Development (USAID), and the U.S. Embassy in Prague we also got some textbooks, and the first window to the world academic community was opened.

The problem of the language barrier needed to be solved. After a very short time we understood that the language barrier is the strongest obstacle to going farther and faster with our university reform. The absence of direct communication between our faculty members and visiting western academicians, as well as between our students and their English-speaking visiting professors, made it clear that we needed to put a strong emphasis on language, particularly English training at the top of our priority list. We mobilized not only our internal financial resources, but also big support from many western universities, mostly in the United States, that offered their professors and the possibilities for our students to study at their institutions. Since 1990 we have hosted hundreds of visiting students and professors through formal and informal exchange programs; all of them have assisted with our efforts to improve the English proficiency of our students and faculty. The English language has become more and more prevalent in our classrooms and dormitories. Many of our students have started to use English language textbooks for their courses

in economics, language training, and other subjects. In 1991, we offered the first economics courses in English for a limited number of students. However, we understand that the language problem can not be solved in a period of only several months.

International Assistance with the Reform Process

Our international contacts and assistance from abroad were significantly expanded with our first Project on Economic Education and Management Training implemented jointly with Iowa State University (ISU). This project was targeted to include all three agricultural universities in the former Czechoslovakia: Prague, Brno, and Nitra. The project was funded by USAID and generously supported and implemented by ISU. The main goal was to assist our institutions to deliver a basic knowledge of economics in a systematic way to a very broad audience including faculty members, graduate students, and managers. The special bilingual textbooks developed under this project were extremely useful, not only for all the participants, but also for our faculty working on new economics textbooks and instructional materials.

The project had several components: (1) the direct economic education of the involved and interested Czech and Slovak colleagues; (2) managerial training for newly emerged managers of private companies and farms; (3) study tours for the Czech and Slovak participants at U.S. governmental and professional institutions; (4) student and faculty exchanges and assistance with instructional materials, (ISU-Prague-Brno-Nitra); (5) working seminars; and (6) assistance with curricula evaluation.

Thanks to this large-scale and well-organized project, approximately 50 faculty members from Nitra visited the United States and spent time with ISU, USDA, and particularly with USDA's Economic Research Service. Some of our private farmers got their first chance to become familiar with U.S. family farming and farm operations. Approximately 40 students from Nitra spent some time at ISU and approximately 20 ISU students spent one semester at Nitra University. Several ISU faculty members spent their sabbatical in Nitra and participated actively in reshaping our curricula.

As the highly positive result of this useful cooperation I could mention the primary changes introduced not only into the form but also the content of our economic education. The old, rigid educational system, under which there was no way for students to participate in designing their curricula, was replaced by a more flexible credit system. The assistance from ISU in this process was very effective. As a final product we developed the system by which students could participate in designing their curricula and become an active part of the educational process. Our teaching goal was to shift our programs from the passive formula "a student has to be taught" into an active one, "a student should learn." Students, like other consumers, got the right to decide on the selected subjects. The introduction of the credit system with the active participation by students in designing their curricula represents one of the most important achievements in the last reform process at our university. There are still many problems that should be addressed, but the spirit and understanding of flexibility in university education was successfully infiltrated into our academic environment.

The second, large Project on Economic Education was prepared and successfully completed in cooperation with Cornell University. The main goal of the project was to offer the economic (MS-level) education to a larger number of students from Slovakia and neighboring Central European countries. This project was funded by the Andrew Mellon Foundation, the Soros Foundation, and partially by the Slovak Ministry of Education; significant contributions also came from Cornell University. Through this project we expected to educate our new faculty by assisting them to prepare for Ph.D. programs. (This goal, however, was never reached.

Immediately after their graduation, the graduates of this program disappeared into the newly emerged Slovak and foreign private companies.) The importance of this project was also in the follow-up activities, oriented toward faculty development. For Nitra's faculty we created sufficient opportunities for study visits and for development of working contacts with their counterparts at Cornell University.

Other U.S. partners that played an important role in the reform process of our university were West Virginia University, the University of Delaware, Texas A&M University, and Chapman University. All these institutions contributed significantly to the development of our university in different ways. But the unifying sign of their contributions was, and still is, better understanding of international cooperation in higher education.

Throughout the transitional period of the Czechoslovak and Slovak universities, the TEMPUS program (funded by the European Union) and many other programs aimed at the reform of university institutions played a special role. TEMPUS and its students and faculty exchange components contributed significantly to the expansion of international contacts among academics in Eastern and Western Europe. In addition, through this program our universities received significant support for improving their technical facilities, particularly their computing facilities, which aided them in joining the international information family.

Recent Developments in the Czechoslovak and Slovak Higher Education System

Shortly after the New Act on Higher Education came into effect, Czech and Slovak universities utilized their rights to decide on their internal matters. Significant structural changes took place within the higher education system. We observed the explosion in creating new departments, faculties, and even new universities. The "upgrading" of departments to the college level and colleges to the university level was obvious.

The Organization for Economic Cooperation and Development (OECD) expert panel that reviewed our university system in 1992 had to conclude that there was no real and comprehensive university system in Czechoslovakia. Rather the higher education system was represented by some two hundred mutually isolated, academically narrowly oriented colleges. Many of them, supported by the existing legislation, started independently to reshape their educational programs, to create and to offer the new, frequently redundant, or internationally incompatible academic programs. The reform goal for restructuring the higher education system was misunderstood and operated primarily as a mechanical way to increase the number of students. Data for the Slovak higher education system in 1998 are shown in *Table 2*.

A comparison of *Table 1* and *Table 2* shows that since 1990, the total number of university students in Slovakia has increased approximately 80 percent. During the same period, the number of faculty has increased only about 13 percent. The total funding for Slovak universities in 1998 was about the same level as in 1990. Despite this serious budget restriction, individual colleges, using the weaknesses of the current legislation, systematically increase the total numbers of their full-time and part-time students.

This irrational growth of total enrollment can not be stopped without the coordinating role of the university (in the case of universities) or the Ministry of Education (in the case of Slovakia as a whole). For this, the modification of the existing Higher Education Act is urgently needed. The Slovak higher education system is currently in the trap of its democratic, but naïve and

unqualified, basic legislation. The current organization of university education is economically ineffective and is causing many problems in reshaping the academic side of the Slovak higher education system into a system comparable with the higher education systems in western countries.

Conclusion

Despite all the problems I have indicated, there is no doubt that Czech and Slovak higher education institutions have made significant progress since 1989. I would summarize the highlights as the following: democratization and self-management of the higher education institutions; significant progress in the curricula reform; introduction of the Ph.D. programs; progress in continuing education; some progress in organization of the scientific and research work; and successful internationalization of the higher education system.

The primary aim of this presentation was not to draw up a conclusion on the status of the Slovak higher education system. I do hope that its current status and structure is not the final one. To achieve the compatibility and comparability with higher education systems on the international level, we have a long way to go. To be successful in this process we would need to open the discussion on the legislative framework under which our university system operates. The existing tension between university leadership and leadership of individual faculties, however, makes such discussion very difficult. It is my strong belief that international cooperation and technical expertise are urgently needed to solve the problem.

Group	Number	Humanities	Technical	Economic	Agriculture	Art
Universities	18					
Colleges	83	38	18	13	7	7
Students	86,804	33,795	26,410	17,297	8,001	1,301
Students %	100	38.93	30.42	19.93	9.22	1.5

Mobilizing Development For Agricultural Institutions: Experiences From Bunda College of Agriculture, Malawi, Africa

Zachary M. Kasomekera

Background

The success of Bunda College of Agriculture from an initial intake of 35 students in 1966 to the current average intake of 110 students was originally influenced by external forces. But recently, effective local leadership and management skills have shaped the college to international standards. The driving force behind Bunda College's success is the institution's response to prevailing national, regional, international, and, yes, donor needs and preferences. Over the period from 1966 to 1999, Bunda College has doubled its student population from 250 to 550, and the academic establishment has also doubled from 26 to 53 staff.

The development route for Bunda College has at times been rough and challenging, except for the period from 1966 to 1976 during which the newly independent Malawi Government resolved to make agriculture its top priority. Agriculture, especially the smallholder sector, was the only viable development alternative for Malawi, which was among the 25 poorest nations in the world in 1964 when independence from the British was achieved. Faced with abject poverty (per capita income less than \$100) and a high population density (80 people per square kilometer, four times the African average in 1976), the most viable development alternative for Malawi was improvement of small-scale agriculture. Prior to 1964, Malawi's major foreign exchange earner was labor export to neighboring countries, mostly South Africa and the former Rhodesia, which absorbed up to 60 percent of Malawi's wage employment.

Malawi, unlike her neighbors, has no significant mining industry and the only exploitable resources have been fertile soils and reasonable average rainfall

(1100 mm/year). In the 1960s, lack of modern agricultural extension proved to be the major stumbling block to rapid agricultural development, hence the need for a higher-level training institution in agriculture.

The Role of Bunda College of Agriculture

In the Malawi Government Development Policy, 1971 to 1980, agriculture was given the highest priority; the main area of emphasis was small-scale farmers who constituted 80 percent of the total population. But by 1975, technical agricultural personnel served only 9 percent of small-scale farm families. Bunda College, instituted in 1966 under the Ministry of Agriculture, was mandated to meet the 91 percent shortfall in agricultural technical personnel, especially in extension. This was an ideal situation for Bunda College to grow with full support of government policies. Indeed, the period 1962 to 1981 was a boom period for Bunda College. The major challenge was to design a curriculum that would focus on persuasive agricultural extension methods, in contrast with the harsh colonial extension methods that imposed prison sentences for offenders. The University of Massachusetts was the major collaborating partner with Bunda College in developing this new curriculum.

The Ministry of Agriculture was the main proponent for the establishment of Bunda College in 1966 with a \$1.6 million grant from the United States Government. The University of Malawi had been founded in 1964 by the University of Malawi Provisional Council, which was also mandated to consolidate all colleges of higher education. Hence, Bunda College was incorporated into the

University of Malawi in January 1967. The college has had dual lineage since 1967, conducting all administrative business with the Ministry of Education through the University Central Offices, and executing all technical matters with the Ministry of Agriculture. The early main focus of Bunda College was to train agriculturists who could meet the needs of small-scale farmers and to conduct research that could improve small-scale productivity.

Early development efforts

During the period of 1962-1980 there were two major donors, the United States Agency for International Development (USAID) and the British Overseas Development Agency. The British Government provided funding for some of the infrastructure (library and hostel) during the period 1966 to 1967, while USAID provided \$1.6 million to undertake construction of most of the facilities at the new college. These early structures were the basis for increasing the student population from 35 in 1966 to 153 in 1969. The agriculture personnel technical gap of 91 percent in 1972 precipitated significant attention from donors.

In the early 1970's, the University of Malawi and the Malawi Government were convinced that Bunda College had to be expanded to a student population of 365 by 1980 in order to meet the high demand for agricultural technical personnel. By 1975, the student population was 209, of whom 19 were female students; while the total academic staff complement was 26, with only 6 local staff and 20 expatriates. Bunda College set out on an aggressive localization program aimed at achieving 92 percent localization by 1980 with a projected staff complement of 36, of whom 32 would be local staff. This was a very important concept and one that has preserved the academic staff capacity, which currently stands at about 98 percent local staff. Up to two thirds of those staff members have doctoral degrees.

The 1976 to 1981 expansion project was the turning point for Bunda College, from a small college to a medium college by Southern African standards. With a staff complement of 36 and a student population of 365, the college had attained the critical mass necessary to embark on local consolidation. Infrastructure funding came from USAID with a \$4 million grant, and FAO assisted in providing 40 man-years of scholarships and

27 man-years of technical backstopping personnel. With five multipurpose instruction structures (laboratories, lecture theaters, offices), 21 senior staff houses, and 64 support staff houses, this was the most extensive single construction project for Bunda College. At the end of this development phase, Bunda College had successfully redesigned its curriculum to train researchers, planners, and extension personnel at diploma and degree levels. Part-time masters and doctoral programs were offered to deserving candidates, and the college had embarked on various research projects in agriculture.

Stagnation period

Bunda College had filled most of the gaps in the agricultural technical personnel sector so that the period 1981 to 1990 did not experience growth of any significance. As of 1981, the college enrollment had grown to 427 students, almost a 100 percent increase from the 1976 figures. The employment market had started to feel the increased output from Bunda College so that it was not unusual for graduates to wait for up to a year before finding a job. The employment trends started changing from the previous 70 percent employment by the government to about 40 percent while the other 60 percent were absorbed by the private sector.

This was a period of self-examination for Bunda College to strike a balance that would not only satisfy the new employers but also attract donors to fund infrastructure development. Until 1981, the college development was largely initiated by the government, especially the then Head of State who had a personal interest in agriculture and who regarded Bunda College as his special brainchild. Indeed, it was not unusual in the years 1969 to 1979 for the principal of Bunda College to be summoned by the Head of State to review the progress of the college.

Leadership in agricultural colleges calls for the ability to solicit advice not only from peers but also from the consumers, current students, and alumni. Most university colleges in Southern Africa have the External Examiner Peer Review System, and there is always a need to actively engage employers, alumni, and students in a constructive dialogue that can pinpoint areas of concern. With little, sometimes none at all, government initiative, Bunda College embarked on impact analysis to isolate critical areas of weaknesses and strengths. Of immediate concern

was the relevance of the curriculum, which was a strait-jacket concoction of courses common to all students. The only exception was that all female students were required to take home economics courses, whereas male students took agricultural engineering. It wasn't until 1984 that both male and female students had a choice to take either engineering or home economics, and this was the first step in major curriculum reorganization.

To assess the impact of Bunda College on the Malawi economy, a series of consultative workshops and conferences was conducted during which alumni were invited to critique the curriculum and suggest improvements. Students were also invited to pinpoint areas of overlap and/or repetition and areas of omission. Three areas of concern were: (1) Bunda produced generalists that had to be retrained for specialized areas; (2) the Bunda product lacked management skills and, hence, could not fit in the private sector; and (3) graduates from Bunda did not have skills in commercial agriculture; hence, they could not run agricultural commercial enterprises.

These findings were partly obtained from an impact tracer study funded by USAID in 1986 whose focus was to assess past successes of Bunda College programs and prescribe changes for the future. A new curriculum was designed and implemented in 1986 that allowed students to take common courses in the first two years, and then opt for specialized areas during their third year and subsequent two years for those who proceeded into the degree program. As the first graduates with specialization left Bunda College in 1991, the college had started gaining recognition not only in Malawi but also in the whole Southern Africa region. At the same time, the capacity-building momentum that had started in 1976 was yielding good results, so that by 1989 the College staff was 90 percent localized and up to 60 percent of the local staff members had doctoral degrees. Despite these positive aspects, Bunda College together with the four other colleges in the University of Malawi system did not see much development up to 1991, mainly due to the lack of local initiatives and marketing of institutional capabilities.

Mobilizing Development

The transition from government-initiated to locally mobilized development is very critical because, in most cases, it is the same college leadership that has to facilitate this transition. More often than not, the old leadership expects the government to initiate development, while the government might have shifted its attention to current pressing needs.

Indeed, it took until 1986 for Professor Brown Chimphamba, the principal of Bunda College since 1981, to start enticing his staff to prepare a comprehensive development proposal to establish the Center for Agricultural Research and Development (CARD) aimed at enhancing research and consultancies. Until this time, the only major research activity at Bunda College was the Collaborative Research Support Program Bean/Cow Pea project, funded by USAID, which was initiated in the 1970s. Lack of tact and experience in soliciting funds for development hampered progress on the proposed CARD. The spirit of locally initiated development projects, however, was instilled among staff at Bunda College and this was the basis for the rapid development of Bunda in the 1990s.

One major achievement during the period 1981 to 1990 was the improvement from gravel to a tarmac surface of a 20-kilometer access road to Bunda College, made possible through direct negotiations with USAID. The gravel road, which was always in a poor state especially during the rainy season, had isolated Bunda College since 1967. Along with getting a good road, the then principal also lobbied the government to improve telephone communications. Until the late 1980's the college had only two telephone lines, making it impossible to conduct any meaningful business by telephone. An improved road and expanded communications were significant landmarks in the development of Bunda College because the outside world was now able to access the college by road and to conduct considerable business with the college by telephone.

It was clear for Bunda College that the recipe for development would now depend on a number of principles, which included the following:

- Redefine the curriculum to meet prevailing government policy and the needs of the private sector;
- Carry out aggressive outreach activities to inform all potential funding agencies about the potentials of the institution and the major constraints preventing optimal operation;
- Build institutional confidence among staff so that they are able to articulate the vision and commitment of the institution in national and regional development;
- Conduct a thorough goal-setting exercise for all departments and faculties, and rank these goals at the departmental, faculty, and college level so that potential funding agencies can choose areas of assistance;
- Engage in continuous dialogue with donors and government to keep up with their areas of interest and procedures for project preparation and presentation; and,
- Institute a staff appraisal system that is objective, transparent, and consistent in order to reward high performers, but at the same time encourage below-average staff.

The early history of Bunda College reveals a tradition of public relations conducted mainly through an annual field day (open day) that attracted local farmers, donor representatives, and government officials. This occasion was the forum for lobbying policymakers and donors alike to support Bunda College. As the years passed, finances could not allow such a large gathering of people to be provided with lunch and refreshments so the event became bi-annual and eventually was dropped. An alternative activity (Getting to Know Bunda) was introduced in the mid-eighties by Professor Chimphamba.

This activity was targeted at selected potential donors and policymakers who were invited to spend a day at Bunda College to examine the college research and teaching activities. This approach was not only affordable but also narrowed down negotiations to the potential donors.

In 1990, the new principal, Professor Zimani Kadzamira, introduced yet another effective approach to donor sourcing and lobbying of policymakers. Bunda was fortunate to be assigned a principal who had informal ties to the then ruling circle, an avenue he effectively used to influence development activities of the college. He also adopted a door-to-door approach to influence donors to pick up the proposed CARD initiative at Bunda College. His political connections and the effective lobbying with donors paid dividends and USAID pledged to fund a component of CARD, the Agricultural Policy Research Unit.

During the period 1992 to 1998 Bunda College has seen development equal to, if not greater than, that of the period 1966 to 1981. The door-to-door donor sensitization was systematically executed with well-articulated goals and objectives. In 1992, as the new principal, I requested that all Heads of Departments prepare ten-year plans, which indicated major past achievements, existing underutilized human capacity, and the major constraints. The ten-year plans clearly defined goals and objectives for each department, from which college-wide priorities were drawn up. The development of institutional goals and priorities is a necessary condition for donor funding sourcing, and these plans provided the basis for the current Bunda infrastructure development.

Among the pressing needs for the college was the library, which had been designed for a student population of 250 compared with a prevailing population of over 500 in 1992. This was considered a critical constraint to the Master of Animal Science program introduced in 1989 and to other masters programs that were on the drawing board. Traditional donor funding could be used to finance library expansion, but consultations with USAID showed that the Local Currency Account could be used to fund the expansion. A total of U.S.\$875,000 was secured from USAID in local currency and paid in advance to Bunda College to expand the library and construct one hostel. After more than 25 years of existence, Bunda College was able to embark on a

major challenge to locally manage donor funds on a construction project. This was a much needed litmus test for the college, and this project earned the college the respect of the donor community when the project was successfully completed and the library capacity was increased by a factor of four.

Forward planning in leadership is as critical as efficient execution of projects, especially in developing countries where currencies can be devalued by as much as 500 percent during the life of the project. The original USAID grant to Bunda in 1993 was adequate for library expansion and hostel construction. But by the time the project was being implemented, the local currency had been devalued by 300 percent and the original grant was not enough even for library expansion. In anticipation of possible currency fluctuations, the college had deposited 80 percent of the funds in a fixed deposit that yielded high interest, and this is what provided the extra money to complete the library. Another U.S.\$60,000 was negotiated from the World Bank to provide furniture and other equipment for the library project.

The successful negotiations and execution of these major projects sparked a zeal for seeking donor funding among members of the staff, and this resulted not only in more funds but also in a proliferation of donors. Two comprehensive projects were developed during the fiscal year 1995/96, one for Social Forestry or Agroforestry to be funded by the European Union, and the other on Aquaculture to be funded by the Japanese. Both were donors that had never funded infrastructural developments at Bunda College before. Both of these projects were successfully negotiated by 1997 with combined funding of U.S.\$11 million (U.S.\$5 million from the EU, U.S.\$6 million from Japan).

The most important lesson learned from the EU and Japanese projects is the need to fully engage the government and the donors. Earlier experience with USAID showed that the success of project negotiation lies in both the institution's capabilities and the inclusion of a donor facilitator. It is important to identify a senior officer within the donor agency who can assist you with project preparation so that proper format and wording, together with favorite buzzwords, are incorporated in the draft proposal. At the same time, the institution has to team up with government departments that can verify the national needs of the proposed projects. Bunda

College worked closely with the Fisheries Department in the aquaculture project and with the Department of Forestry in the Social Forestry project.

The ten-year plans from most of the departments at Bunda College included graduate programs, but the graduate program in Animal Science had to be halted in 1990 due to the lack of accommodations. The German Government technical assistance agency (GTZ), threatened to withdraw funding altogether if the Malawi Government did not provide adequate accommodations, but there was no funding at that time for infrastructure. The time was ripe for Bunda College to demonstrate institutional commitment to graduate programs. Indeed, the college used local resources to design and construct the first-ever Graduate Students Hostel with 24 beds (spaces for 8 females and 16 males). There was a general outcry, especially from the University Office, that Bunda College could not plan and execute a locally funded construction project, but with careful monitoring the college achieved its goal. This was a landmark for the subsequent interest among donors to fund graduate programs at Bunda College. In most donor-funded projects, local commitment is as important as capacity to execute the proposed project.

In resource-poor countries like Malawi, it is sometimes not easy to convince the government and donors alike to fund new programs because sustainability is always questionable due to rapid saturation of human resources demand. The saturation of extension personnel in the Ministry of Agriculture by 1986 is a case in point for Malawi. Bunda College was fortunate to have a pool of academic staff that made the college attractive to regional programs. The Masters in Animal Science, funded by the German government, was one of the first regional programs whose success led to a regional program in aquaculture, which was the basis for the Japanese aquaculture project. The college has now been used for regional programs in tissue culture, agroforestry, and environmental policy. Most donors regard the regional approach as viable in terms of demand for human capacity and cost effectiveness.

The natural development of a university college is the attainment of autonomous university status, with well-established undergraduate and graduate programs. Bunda College introduced the first masters program in 1989 and by 1998 the college had managed to implement five more masters programs; these have greatly enhanced the college's image at the national and regional levels.

Achievements

During the period 1990 to 1998 Bunda College has made significant achievements in the areas of infrastructure and curriculum development. A milestone in curriculum development was attained in 1996, through the hard work of the Dean, Dr. George Kanyama Phiri and his Heads of Department. Bunda College managed to design and implement a grade point average system in order to allow easy transfer of credit hours at the international level. It is expected that the college can now attract a wider circle of international students, while allowing its students to transfer university credit hours to other countries.

Research funding, which has improved from about 29 percent of total budget in 1989 to 46 percent in 1997, has been yet another significant achievement at Bunda College. Most of this funding has been directed at the new masters programs and collaborative research between Bunda College and international universities and organizations. For a long time, research at Bunda College was funded mostly by USAID mainly through the CRSP Bean/Cow Pea Project. As of 1997, there were more than 11 international universities, donor agencies, and governments engaged in research. The key to successful sourcing of donor research funds is the caliber of staff members to produce quality research work and diligence of the administration in managing research funds.

Enhancement of female students' participation in university education programs has been a University of Malawi policy since 1990. The target is to reach a 30 percent female enrollment in all university programs. Bunda College embarked on a role model initiative for female students, whereby all academic departments at the college were requested to recruit at least one female staff member. By 1995, all academic departments at the college had accomplished this goal. This approach is yielding dividends in terms of increased female student enrollment at Bunda College; the female student component has grown from 16 percent in 1990 to 24 percent in 1997.

The student population has grown from 400 in 1990 to 550 in 1997 and is expected to reach 800 once the current infrastructure changes are completed. Out of the current student population, up to 20 percent are graduate students and at least two to five percent are foreign students. The goal is to attain a 30 percent graduate student component and 10 percent foreign students.

The challenge to university leadership is maintenance of research and development momentum. Bunda College has, for a long time, wanted to develop a comprehensive strategic plan that can provide future development areas in a systematic manner. Although departments had prepared ten-year development plans in 1992, these were mostly shopping lists that lacked coherent structure for long-term donor commitment. The Government of Norway's Minister of External Affairs visited Bunda College in 1997, and the college highlighted its needs together with the need to prepare a strategic plan to consolidate future developments. A fact-finding mission to Norway led by the then Vice Principal, Professor Leonard Kamwanja, managed to convince the Norwegian Government to pledge long-term commitment to Bunda College together with resources for developing a strategic plan.

A draft strategic plan has now been prepared and the overall mission of Bunda College as we move into the new millennium is stipulated as follows:

- The mission of Bunda College, as an educational institution of higher learning in agriculture and natural resources in Malawi, is to advance and promote knowledge, skills and self-reliance for:
 - Sustainable food production and utilization;
 - Improving income, food security and nutrition of the rural and urban populations;
 - Conservation and management of bio-diversity, natural resources and the environment; through the provision of information, teaching and training, research, outreach and consultancy in response to national and global needs.

The emphasis in the future outlook of Bunda College is a participatory approach to curriculum development and empowerment of graduating students to embark on self-employed agricultural business ventures with limited reliance on wage employment. This approach calls for re-engineering not only the curriculum but also the lecturers, who should place more emphasis on real-life agricultural problems that should be solved using alternative theoretical approaches.

Persistent Constraints

The Bunda College scenario is common to most of the countries in Southern Africa: the establishment of the college is through government initiative, but there is always a point of stagnation in the development process. Most of these countries, Malawi included, have the pressure of high demand for university education. This high demand forces university institutions to enroll more students than they are able to manage, which leads to overcrowding and the subsequent lowering of educational standards. Compounded with this problem is the gradual erosion of local currency value, so that the actual local currency amounts may be increased but in real terms the value could actually be going down.

National institutions such as Bunda College are political assets in which management has to conform with prevailing political aspirations; as such the College cannot achieve optimal levels of management. One of the most difficult areas is the student fees, which in most cases require government approval. Financial constraints could be alleviated if the true cost of a university education was charged to students, but this has not been possible given the low incomes of the majority of the electorate in Malawi.

There is a persistent poor distribution of salaries in Malawi whereby university personnel seem to get very low salaries when compared with professionals in the private sector. This state of affairs affects morale among staff and those that are offered jobs outside the university system do not return to their university posts. This is the major threat to Bunda College stability and achievements. Current salaries at Bunda College, with most academic staff receiving less than U.S.\$500 per month, turn this threat into panic. Supplementing of salaries of local professionals has been debated but this is some of the most difficult funding to secure from donors.

In this day and age, communication is a key to effective teaching, research, and administration, but the level of communication technology in Malawi is still lagging behind international standards. Coupled with this problem are the high cost rates for telephone and other related services. For example, telephone charges from the United States to Malawi can be as low as U.S.\$0.50 per minute, yet calling the USA from Malawi is up to U.S.\$3.00 per minute. This limits the acquisition of research data and other pertinent information for effective university teaching, hence retarding research and development in Malawi. This scenario is true also with other research and development equipment and services such as computers and the internet.

Valuable Lessons

The experiences at Bunda College offer a number of lessons that can assist other colleges, especially those in Southern Africa, to plan and execute development initiatives. The most paramount lesson is the need to clearly articulate institutional goals and objectives that can be used to solicit assistance from government and donors.

Institutional capacity is a very important prerequisite to sustainable development and donor support. It is very critical to impress on government and donors alike that the institution can manage and administer resources. A disappointed government or donor is a fatal liability to a young institution, and all efforts should be made to live up to the expectations of these funding sources.

Leadership skills are a necessary ingredient to mobilizing institutional development. No matter what human capacity may exist, if it is not properly harnessed, managed, and directed there will be chaos and sometimes conflict. The best leadership recognizes its strengths and weaknesses and is able to delegate effectively. It is important to appoint local staff into leadership positions because they are most often aware of the existing potentials of the institutions.

Indeed, the most important ingredient to successful development mobilization is the ability to identify government policies of the day relevant to the institution, and to identify prevailing donor areas of interest. Institution development can only be supported if it is in line with current government policies and/or donor priorities.

What Does the Future Hold? Dreaming and Doing

Ramon de la Peña Manrique

It is an honor for me to share some ideas with you that for me are very important. I am a “BC” chemical engineer. That is, before calculators. Also, before computers. I represent a Mexican private university. I will say a national, private university. I have been with the Monterrey Institute of Technology, our Mexican MIT, for 33 years, the last 14 years in charge of the main campus in Monterrey, Mexico. I will begin with an idea from a book by Peter Flawn, former president of the University of Texas, who said,

The most important responsibility that the president of a university has is to establish the institution's agenda. Without any doubt, operating the institution in an effective and efficient way is not enough. If the university is to have direction and purpose, the president must direct his or her attention away from operating problems long enough to develop a vision [I will say a dream] where the institution can be in 5 years or even 10 years. If the president's vision is to become reality, a carefully crafted grand strategy must be devised to move the institution into the right direction with the right speed.

This was taken from Peter Flawn's book *A Primer for University Presidents*. It is clear to me that I can reach the future as a person, as an institution, as a company, as a country, or as a state in one of three ways: by doing nothing; by being pushed by the solution of problems; or by being pulled by a dream. And, of course, all of these are immersed in global international trends. If we take Latin America, then the global trends that will impact our Latin American universities are two: a changing world, of course, and the learning revolution.

What are the key words of this changing world? There are several: globalization, internationalization, global communications, the Internet, globalization of financial information, world markets, e-market, e-business, international alliances, the global trade web, digital economy, and so forth. And, what are the key words in our learning revolution? They are knowledge economy, collaboration, reskilling, team skills, building and applying competencies, learning how to learn, values, attitudes, habits, student-centered learning, the virtual university, and international and national collaborative learning groups. All of these are simplified by the increased communication system—the Internet.

However, while we have a truly impressive electronic technology that we can apply in our universities, we still have educational models designed for older technologies.

Dreams for the Mexican Educational System

Going back to Latin America, we know that we can reach the future pushed by the need to solve existing problems. In our Mexican educational system, we have four big problems: (1) quality, (2) the relevancy of the academic programs to the community, (3) the lack of resources, and (4) the lack of productivity. Of course we need to solve these problems, but we can follow another road. We can reach the future pulled by a dream.

Looking into the history of Monterrey Tech, I see a lot of dreams and a lot of doing in order to bring those dreams to reality. The initial dream, the one of our founder in 1943, was to have a university to educate the professionals that would support the economic development of Monterrey. We started with great support of the private sector. We grew, we multiplied, we consolidated, through the support of the private sector in Mexico.

And that initial dream took us about 20 years. The second dream, the multiplying of that dream, began with a question, “Could we have a campus like the one you have in Monterrey in my city?” And we said, “Why not?” So we expanded from one campus to 26, and from 2,500 students to 45,000 students. Now, in 1999, we have more than 80,000 students in our 26 campuses throughout Mexico.

Then, we have the third dream, we can call it the consolidation dream—to really strengthen Monterrey Tech as a system. We did it through five strategies, five roads: one is quality, the second is innovation, the third has to do with internationalization, the fourth with the promotion of values, and the fifth by continuing to support the economic development of Mexico. In quality, for example, we did it through strengthening the key factors in order to have good students, good faculty, and relevant academic programs. As I said before, relevancy is very important to us, as is a very good library and a good academic environment. And so, if we implement programs and projects to really have good students, good faculty, relevant academic programs, a very good library, and a very good academic environment, then I can assure you that we can have a very good university.

The next step after we defined those strategies was to define and implement the programs and try to strengthen the key factors. We had the four C’s in mind—first, commitment to the dream. Second, the champions; we say that to move us from talk to action, we need a champion. We need a person with the ability to lead us from the saying to the doing. Third, we need coordinated actions to ensure efficiency and impact. Fourth, we need the combustible—the money. That’s the first law of thermodynamics—there is no free lunch. Definitely, you need money. And, if you want money, you have to go and ask for it. For instance, if I want your money, you have to say, “I like Ramon de la Peña.” So, you have to know me. You also have to say, “I like Monterrey Tech.” So, you need to know Monterrey Tech. And, third, you need to say, “I like your dream.” I see colleagues going into the third step trying to sell a dream before selling themselves and their university. And, when that happens, the people reach into their pockets and give pocket money instead of a big check for \$100,000, \$200,000, or \$1 million. The big checks came when people said, “Yes, I like Ramon de la Peña, I like Monterrey Tech,

and yes, I like the dream that you want to implement in your university or the dream that you want to implement in Mexico. Yes, we want to transform Mexico into an entrepreneurial country.” And, of course, people would say, “Yes, I like that dream and I will support you with enough money to do it.”

The Present Dream

Let’s pass into our present dream. The last dream, the consolidation dream, took us about 12 years. In the last three years, we have defined our present dream. We have it in black and white. First we said, let’s define the challenges that Mexico faces where the institutes can play a significant role. We decided there are four very important ones. First, the creation of more jobs. That is why the entrepreneurial program is very key to me and is very key to us. The second one is the international competitiveness of the Mexican companies, and we do this by supporting our research centers, quality manufacturing, environmental quality, and strategic studies. The third challenge has to do with the democratization of Mexico. I am President of the election board of Nuevo León because I wanted to send a message to my students: If you don’t get involved, then you should not complain. Because the future can be changed, and let’s do it, let’s participate through the electoral process to put the right people in the right office to do the right things—the things that we want in our city, in our state, in our country. The last challenge has to do with the improvement of education in Mexico. That is why I like very much the virtual university, because it has truly a multiplying effect that can be used to promote improvement in the educational system in Mexico.

The second step of our present dream means the definition of our shared dream. With the participation of the members of our board of trustees in each of the cities where the institute has campuses, and with the presidents, vice presidents, directors, faculty, alumni, and students from all of our campuses, we have had the participation of more than 4,000 people participating in the creation of a shared dream. Once we defined our dream, we moved to implement it through programs and projects. We defined the Monterrey Institute of Technology mission as educating individuals who are committed to the social, economic, and political improvement of their communities.

The third step was to say, “Let’s define the key factors that would impact our dream.” Those key factors are the students, the faculty, the teaching/learning process, research and extension, the virtual university, the internationalization process, our philosophy of operation, and our relations with alumni and trustees.

And then, the fourth step, let’s dream over each factor. We dreamed about our students, we dreamed about our faculty, and we dreamed about the teaching/learning process. We dreamed about research and extension and we say it must be relevant and aimed at supporting national and regional sustainable development, particularly in the fields of innovation, technological development, competitiveness, planning for sustainable development, and the improvement of education in Mexico. And then we said, “Well, let’s dream about the virtual university, let’s dream about internationalization, let’s dream about our philosophy of operation, let’s dream about our alumni, and let’s dream about our trustees.”

For the fifth step we said, “Let’s define the roads to follow.” That was the definition of our strategies. We decided that five are very important. The first one is reengineering the teaching/learning process. The second strategy is focusing on relevant research and extension for Mexico’s competitiveness. The third is developing the virtual university, and the fourth is the internationalization of the institute. Currently we have about 140 working agreements with universities, mainly in the United States and Canada, fewer in Latin America and Europe. And, the fifth strategy has to do with maintaining the continuous improvement process. This includes the evaluation of all of the professors, the academic department heads, the deans and the president by the students and faculty. For example, every semester I am evaluated by 16,000 students on the Monterrey campus and by more than 700 faculty members; I receive an evaluation from one to seven. One is very good; seven is very bad. I won’t tell you my evaluation, but everyone can send me messages through the Internet or through that evaluation system about the things that we should improve in our school.

Also, as a second part of the continuous improvement process, we are looking very strongly into the accreditation system. We are accredited by the Southern Association of Colleges and Schools in the United States; by the Accreditation Board of Engineering and Technology of

our Engineering Program; by the American Assembly of Collegiate Schools of Business; and we are accredited in The Institute for Food Technology for Agriculture. Now we are preparing for the ISO 9000 certification for our research centers.

Of the five strategies I would say that two are key strategies. First, the virtual university, which gives us a truly multiplying effect. We have more than 1,200 sites throughout Mexico and Latin America so that we could impact other universities and companies. We have what is called “the virtual classroom in your company” with close to 1,000 classrooms in Mexican companies that we send educational programs to all day long. We also have an educational program for public officials of Mexico through the virtual university. This was a World Bank and Monterrey Tech program through which we impacted more than 1,200 public officials in the cities in Mexico, Central America, and South America.

The second key strategy is transforming the teaching/learning process into a learning process. We used basically three elements; first, we are carrying out a didactic redesign using the Socratic approach. I recommend that you read the book by Jostein Gaarder, *Sophie’s World: A Novel about the History of Philosophy*. The kind of professors that we are trying to create at Monterrey Tech will use the Socratic approach. About 30 percent of all of our groups are taught in this manner because we believe in this didactic redesign, and as you know, Socrates always used the right question. For example, he could use this as a question. Why are the letters of the keyboard on a typewriter or a computer in the order they are? A typical professor would say, “Listen to me, I know the answer and here it is.” The Socratic approach is the one that we are trying to use in this didactic redesign. I like this approach very much because as an engineer, it is clear to me that if I don’t know why things are the way they are, I cannot change them.

As a second element we include formative intentions. We include honesty, teamwork, leadership, the art of leading people, entrepreneurship and innovation, or a combination of both. We are also talking about commitment to personal development, commitment to the development of our communities, collaborative work, and responsibility.

And as a third element we use technology to provide

better access to information, better teamwork, better course planning, better management of information, and the possibility of asynchronous and remote teamwork. We are strengthening our technological infrastructure with networks and servers. We use the Learning Space as the basic software that is mounted over Lotus Notes. We are asking that every new student have a laptop and every course be in the Learning Space, and, of course, we are creating and strengthening our digital library.

And then, at the end of our dream, after we define the roads to follow, are the programs, the step to fulfill our dream, the definition of our programs and projects. For instance, one program that has been used by Monterrey Tech to fulfill our dream is Program #5, the creation of centers to support development at all of our campuses and the creation of a network of research centers in the institute's priority research areas. The sequence that we follow is first define the challenges that Mexico faces, then the dream, the key factors, the dream about each key factor, the roads to follow, the programs, and then the process of doing—transforming the dream into reality. In the implementation, for example in research and extension, the basic strategy was to search for problems or opportunities. We saw that we could do something very important for Mexican companies' competitiveness in quality, in manufacturing, in environmental problems, and in using the NAFTA Treaty—what I would call a competitive advantage for Mexico. And, of course, that created projects, programs, or research centers. In fact, that is how we started the Quality Center, the Manufacturing Center, the Environmental Quality Center, and the Strategic Studies Center in the whole country. The Monterrey Tech system has truly had an impact on our entire country. And what were the key factors? They were the dream, the mission, the people, the champions, the relevance of the research program to the community, the relation with industry, the commitment, and, of course, the trust we have tried to create in Monterrey Tech.

The Future Dream

Let me describe a little of what we see as the future in Mexico. Mexico is a nation in transition, but the question is, in transition to where. The final answer will be determined by us and not by impersonal trends. I am a true believer in a future that has not been created yet. The future does not have to be a continuation of the past or the present. I believe the future that we want in our country can and must be created by us, by the people who work at Monterrey Tech, and by other Mexicans. I recommend that you read the book by Michael Mazarre, *The Challenges of the New Millennium—Mexico 2005*, from the Center for Strategic and International Studies, in which the author presents five scenarios for Mexico. The scenarios range from a democratic Mexico through the ungovernable Mexico. Each one has a description and indicators of the scenario. I, of course, like the democratic Mexico scenario. This scenario involves the acceleration of the democratic transition, the continuation of robust economic growth, the creation of a notably larger middle class, and one of the main indicators of success states that elections at all levels are to be more open and more competitive. That is why, in part, I am involved in the electoral process as president of the election board in Nuevo León.

I want to have a dream similar to the one for Malaysia, that was presented by Mahathir Mohamad in his book, *The Challenge*, published by Pelanduk Publications (1986) in which he says, "This is my dream." And the last part of the book poses the question, "Quo vadis Malaysia?" Mohamad says, "This is our dream of Malaysia in 2020." And, this is the dream that I like for Mexico. If you erase Malaysia and put in Mexico, we could say, "By the year 2020, Mexico is going to be a united nation with a confident Mexican society; infused by strong moral values; living in a society that is democratic, liberal, and tolerant; caring, economically just, and equitable; progressive and prosperous and in full possession of an economy that is competitive, dynamic, robust, and resilient." That is the dream that I like very much for Mexico, and, of course, this is the dream for which we are working at Monterrey Tech.

Restructuring Higher Education for the Transition to a Market Economy: The Experience of the Higher Institute for Agricultural Cooperation

Fakhry Mohamed El Boghdady Shousha and Stanley R. Johnson

Institution building was an early strategy for the development assistance programs of both the bilateral and multilateral donors. This strategy addressed both the physical infrastructure of developing nations and the strengthening of public sector service providers. The latter included statistical services, specialized equipment, and training for public sector employees, as well as assistance for education and other sectors involved in building the stock of national human capital (Brookings Institute, 1977; McPherson, 1981). Since the post-WWII period, development assistance strategies have changed, emphasizing the “poorest of the poor,” sector development (e.g., agriculture), ideological competition (e.g., the Cold War), and more recently private sector support. In general, these changes have been driven by the interests of the donor nations, the current global economy and country-specific conditions, and a growing understanding of the factors associated with the growth and development of economies.

Among the results of the decades-old “lack of an inner compass” for development assistance has been the reduced support for these endeavors by the developed nations. This is not a surprise. If the general public cannot be assured that there is a successful strategy and/or if the strategies change often and are not successful, it is understandable that there will be reduced financial and other support for development assistance. In the United States, the shifting strategies for development assistance and concerns about tangible results also have impacted support for both higher education and agriculture as keys to assistance strategies (McCalla, 1998; McPherson, 1981). In the former case, there was a shift to deliverers of foreign assistance away from the universities to what are commonly called the Washington “beltway” consulting firms. The presumption has been that these firms would deliver more quantifiable, short-term results. In the latter case the shift has been in

response to strong opposition from agricultural and commodity associations. These interest groups have argued that assistance to agriculture would increase competition in international markets and reduce export opportunities for U.S. agriculture.

In this presentation we report on a successful institution building effort in Egypt. The main cooperators have been the Higher Institute for Agricultural Cooperation (HIAC) and Iowa State University (ISU). The project is noteworthy for its accomplishments in Egypt, contributing to the national objectives of improving higher education and accelerating the transition to a market-based economy. It is also significant for its implications for higher education institution building as a development strategy. In this connection, at least two elements seem of interest. First, HIAC is an institute that trains students for jobs in technical management and for administrative positions in the emerging private sector. Second, the focus of the initiative was agriculture, the lead sector for economic reform. Thus, the initiative was in tune with the national market driven priorities and the choice of a lead sector for implementation of the reforms.

Our purpose is to report on the HIAC/ISU cooperative effort, and to make generalizations that seem appropriate about higher education institution building as a development strategy, the focus of development assistance on agriculture, and the emerging more critical role for higher education institutions for nations receiving development assistance, given our modern and improved understanding of the growth and development process. We begin with a brief review of the structure of the higher education system in Egypt. The purpose is to provide perspective for HIAC and the HIAC/ISU project. Then we discuss the history and evolution of HIAC/ISU project, followed by a section

on lessons learned. Finally, we return to the broader issues of development assistance, the institution building strategy, and what we believe is a growing role for cooperation in higher education between HIAC and ISU for the success of future development assistance efforts.

The Structure of Higher Education for the Agricultural Sector in Egypt

Agriculture is the oldest of the professions in Egypt. It evolved originally to achieve family and personal sufficiency in food and other necessities of life. Irrigated agriculture in Egypt has changed slowly over time, even though managed under quite different economic systems. Recent years have witnessed rapid development in technology and the concepts driving the policy and organization of agriculture. Especially since 1980, the structure of agriculture in Egypt has experienced accelerating change. Beginning in 1980, major economic reforms were introduced in Egypt that were designed to achieve a transition to a market economy. Because of its importance in Egypt and concerns about food production and food security, agriculture was selected as the lead sector for this economy-wide transition. Also by virtue of its smallholder structure and the independent nature of the Egyptian farmer, agriculture was the sector most ready for the transition to a more free-market orientation, and to precede other sectors in the process of privatization—a significant first step in the market transition.

Agriculture and the economic transition

Agriculture was also a logical first choice for the lead sector in the transition to a market-based structure because of the previous heavy involvement of the government. Price and input allocation, including credit, had been under government control. Much of the processing and distribution system for agricultural and food commodities was under government ownership. This was especially the case for the export commodities and for the staples. The result was a system that imposed high government costs and performed at a relatively low level in terms of productivity. Finally, the public control and monopoly had resulted in relatively slow technological innovation during a period of increasing technical change in the global agriculture and food production system.

It is perhaps remarkable that agriculture education with its numerous and established organizations did not keep pace with the evolving nature of the economic structure for Egyptian agriculture. Outdated principles of economy and agricultural technology continued to be the focus of higher education in the institutions serving agriculture and the agribusiness sectors. For example, in the areas of management and administration, the institutions continued to use curricula that were developed to serve the former planned economy. As well, there continued to be a separation of the research, education, and extension missions of the institutions serving agriculture. Particularly in the case of research, this meant that the newest technologies for the agriculture and food sectors were not reaching the students. Finally, modern teaching and learning methods were slow to find their way into the routine activities of the higher education institutions.

It was necessary to effect changes to better cope with the new human resources requirements of Egyptian agriculture, the aim of which was now national self-sufficiency and the exportation of surpluses compared with a past emphasis on household self-sufficiency. This change has been in response to the growing urban population in Egypt and an increasing dependence on food imports. With the market reforms came the fuller expression of comparative advantage and specialization, leading to a focus on export markets for high value, labor intensive crops. This, too, resulted in new demands for the higher education system and greater emphasis on postharvest technology as well as modern systems of assembly, processing and distribution. From the view of support for this new structure, there was increased emphasis on agribusiness and processing and assembly technologies to reduce losses; reaching global markets; and the functioning and organization of domestic markets.

Agricultural education in Egypt

At the beginning of the nineteenth century, and with the independence of Egypt from the Ottoman Empire, an agricultural renaissance started. Agricultural technical schools were initiated to support the increasingly complex agricultural production and emerging export-oriented distribution system. Late in the nineteenth century, higher education began for agriculture. Early in the twentieth century (1908), a national university was established, which became Cairo University in 1925. The establishment of new universities has continued in Egypt. Most

major cities now have a university. In particular, there are now 13 universities, 17 faculties of agriculture, and 8 faculties of veterinary medicine. There are also two private institutes serving agriculture—HIAC in Cairo and the Higher Institute of Agricultural Cooperation and Extension in Assiut (Upper Egypt).

At a more practical level there are 106 agricultural technical secondary schools, distributed among the 25 governates of Egypt. The main function of these technical schools is to prepare students with skills for careers in agriculture and related sectors. Many of these technical schools are specialized to the types of agriculture of their governates. Students enroll in these agricultural technical skills and graduate as skilled agriculture industry laborers or farmers.

It takes four years after obtaining a High School certificate to graduate from an agricultural university. Each agriculture faculty graduates 500 to 1,000 of these students per year. Study with the veterinary faculties requires five years after receiving the secondary school certificate. The growth area for employment of graduates from agricultural universities is the emerging private sector. All faculties of agriculture and veterinary medicine award B.Sc., M.Sc., and Ph.D. degrees. The total number of faculty (staff and researchers) at the universities dedicated to agricultural education is 3,700 for the faculties of agriculture and 1,172 for the faculties of veterinary medicine.

In addition to faculties of agriculture and veterinary medicine, there are the two private institutes mentioned previously: HIAC in Cairo and the Higher Institute for Agricultural Cooperation and Extension in Assiut. Both are now private institutes, but remain affiliated with the cooperative unions in Egypt. The cooperative unions now are also freestanding and not a part of the public sector. These two private institutes are largely self-financed, increasingly from the tuition and fees paid by their students.

The number of students joining these two private institutes yearly is about 5,000: 4,000 to HIAC in Cairo and about 1,000 to the Assiut Institute. About 75 agricultural schools in the 18 governates are served by the graduates of these two institutes. As well, there are agricultural technicians (assistant engineers) working in the 6,500

rural cooperative organizations who complete their education at these institutes, having acquired practical experience for several years. Generally, these prospective students work in the fields of agricultural and cooperative extension, administration, marketing and land reclamation. These experienced students spend four years at these two institutes to receive the B.Sc. degree. Most of them have arrangements with their employers that allow them to maintain their jobs while studying for the B.Sc.

HIAC serves many of the students coming from work experience with the cooperatives and agricultural extension, or who have already begun their careers in agriculture. It is noteworthy that approximately 90,000 students have graduated from HIAC over the last 30 years. Most of these graduates worked in agriculture before coming to the Institute; a few worked in the fields of agriculture technical education, retail trade, and the industrial and service sectors. The important feature of HIAC's role in serving the economic reform of agriculture is that the students who graduate go almost immediately into jobs within the agricultural sector. Perhaps to a greater extent than in the case of the other faculties of agriculture in Egypt, HIAC provides a means of targeting higher education to directly serve the economic transition process.

Agricultural research in Egypt

Agricultural research in Egypt has evolved to be organized around institutes. In 1883, the first Committee for Agricultural Research in Egypt was formed to study the control of the cotton leaf worm. In 1897, the Khedevite Agricultural Society was established with a broader research mandate, and preceded the formation of the government organized research service. In 1910, the Agricultural Department which managed agricultural research was organized as an affiliate to the National Ministry of Public Works. Finally, in 1913, the Ministry of Agriculture was established. The Ministry organized a Technical Research Committee in 1928. In 1971, the Agricultural Research Center (ARC) was established and affiliated with the Ministry of Agriculture and Land Reclamation. The ARC was assigned the responsibility for drawing up and carrying out projects and developing a strategy for publicly supported agricultural research in Egypt.

The ARC now includes 16 research institutes and nine central laboratories. It employs 2,550 professors (research chiefs), assistant professors (senior researchers), and lecturers (researchers) all holding Ph.D. degrees in the agricultural sciences as well as about 1,335 assistant researchers holding M.Sc. degrees. The ARC has 47 regional and branch agricultural research stations and 21 extension field stations. The Center also has responsibility for the National Agriculture Library of Egypt.

A number of the major international agricultural research centers have branches in Egypt, and participate in research programs with the ARC. These include the International Rice Research Institute; the International Center for the Improvement of Maize and Wheat; the International Center for Potatoes; the International Center for Agricultural Research in Dry Areas; the International Institute for Food Policy Research; and the International Center for Living Aquatic Resources Management. In many cases these international centers work with the ARC in carrying out research projects that are financed by international donors.

Extension and training in Egypt

Agricultural extension and training in Egypt is evolving with the transition to the market economy. The following public sector organizations participate in extension and training.

- The Ministry of Agriculture through its Training Center specializes in technical courses for agricultural technicians and specialists, including participants from other African nations, Latin America, and selected Arab countries.
- The Training Center affiliated with the Central Agricultural Cooperative Union, in close cooperation with the Training Center at HIAC, offering courses in an array of technical and administrative areas.
- HIAC through its Training Center, which was transformed into the Agribusiness Research, Training, and Information Center (ARTIC) as a part of the project with ISU offers courses emphasizing management and business organization.

The ARTIC holds long-, medium-, and short-term training courses for those working in agriculture in Egypt (with an emphasis on agribusiness, marketing, and other skills and resources for successful participation in the market economy). Foreign participants are also served by this Center. The ARTIC as well undertakes training for specialists working in the fields of food processing and distribution, retail trade, export markets, land reclamation, and modern agricultural production technology. It also takes part in preparing trainers for the Egyptian cooperative movement as well as specialists for global and regional organizations such as the International Fund for Agricultural Development, the Food and Agriculture Organization of the United Nations, the International Labor Organization, and the Arab Cooperative Federation.

The History and Evolution of HIAC

In 1960, a cooperative training center affiliated with the Ain-Shams University was established. The course of study within the training center was for one academic year. The curriculum was structured for a long-term training program open to graduates of agricultural technical secondary schools. The objective was to prepare the participants for work in the cooperative societies and in the branches of the Agricultural Credit Bank of Egypt located in rural areas. In 1965, the course of study at the training center was extended to two years, allowing the center to award graduates a two-year diploma in cooperative studies. Students studied a curriculum of social, economic, and cooperative sciences. Among the most important components of the curriculum were agricultural economics, farm and cooperative management, and agricultural extension.

In 1968, the course of study at what is now HIAC was extended to four years and in 1972, HIAC became a formal and accredited four-year program. Secondary school graduates were allowed to join HIAC whether in the year of their graduation or after working for a period of time. Until 1987, the course of study at HIAC was not significantly different from courses of study in the departments of economics at the other Egyptian universities. The main difference in the graduates from HIAC was in the background of the students.

The modern era for HIAC

In 1987, the Institute made a major orientation change and began to specialize more in economic sciences, extension, and agricultural organization. Curricula were changed to reflect the market transition in Egyptian agriculture, which was already underway. The priorities of HIAC for supporting the new Egyptian agriculture were in both education and training. Past graduates and undergraduates had studied courses that served well the planned economy and associated institutions. This economy was largely directed by a central authority and the implementation of associated governmental plans. Students educated in these traditions knew little of agribusiness management and the functioning of market economies. HIAC began to reformulate the course of study for its graduates, giving greater emphasis to mathematics, statistics, computer science, land reclamation, and new lands cultivation. Economic studies were increased to include accounting and corporate finance, price analysis, marketing, information systems, and project or feasibility analysis.

During this period the Institute also initiated graduate diplomas for Egyptian students and for students from the Arab nations. These diplomas were in selected areas: feasibility studies and agriculture project evaluation; agricultural and cooperative marketing; agricultural and cooperative finance; cooperative accounting; cooperative education and training; cooperative extension; and cooperative information systems.

The mission of HIAC had changed in response to the demands of an agriculture guided by markets. However, the available national experience for supporting the associated reforms in the curriculum of HIAC was limited. It was necessary to more fully access the Western model of administrative sciences and business education. This was the reason for the initiation of the cooperation between the Institute and the Center for Agricultural and Rural Development (CARD) at ISU.

The cooperative HIAC/ISU project

With financing from the United States development assistance program, the Agribusiness Research, Education, Training and Media Center (ARETMeC) project was established. The first stage of the project covered the period from 1993 to 1995 and the second

stage from 1995 until the present. Both stages to date have been financed by a total of 41 million Egyptian Pounds or approximately \$12 million U.S. In addition to these resources in the form of development assistance, about 6 million Egyptian Pounds was allocated from the Institute budget to support the restructuring of the education and training programs. The funds for the HIAC budget were mainly allocated to improving the infrastructure of the Institute. The major additions to the infrastructure and educational capacities of the Institute were in the areas of technology and equipment; a demonstration and training facility; materials for education; training of faculty and staff; and technical assistance.

Technology additions included English language laboratories; four computer laboratories; training facilities equipped with up-to-date electronic audio/video equipment; media studio with full capacity for large-scale audio and video reproduction; three electric generators; computers and software necessary for support of the administrative work of the Institute; and a modern electronic information network connecting with national and international communication and library resource systems. Other additions included six laboratories for support of education and training in technical agricultural sciences, equipped with the necessary hardware and with audio/video instructional aids; four buses for transporting students and trainees; three cars for official use; and audio/video equipment in several lecture halls.

As a key part of this project with CARD at ISU a demonstration and training facility, known as the Post Harvest Center, was established on an area of 40 hectares in the New Lands. The center includes a hostel to accommodate 400 student/trainees, an administrative building, a facility equipped for processing fruits and vegetables, and six buildings for workers and farm equipment. Twenty large green houses also were constructed. Farm machinery necessary for the center was acquired, including tractors, cultivators, planters, sprayers, and fertilization equipment. Two deep wells and appropriate water pumps and distribution networks were established at the Post Harvest Center and necessary control instruments were purchased.

Materials purchased for education included library books and reference materials necessary for the new curriculum at the Institute and computers for all senior faculty and

other teaching staff. Additions in the area of human capital included extensive training of professors, technicians, and administrative staff in the United States for various periods of time; support for scientific missions to Egypt by professors and technical experts for participation in projects to upgrade the education and training programs; joint research projects implemented by Egyptian and U.S. partners; and preparation of trainers by their participation in similar programs within the United States.

Additional technical assistance included support of long-term resident ISU professors for teaching courses at the Institute and assisting HIAC professors with the introduction of new materials in the curriculum; support of joint conferences; and participation in training programs on design and implementation of extension services.

In general, more than 70 percent of the cost of the two-stage project was allocated to these activities and to improving the physical infrastructure at HIAC. This allocation of resources represented a true lack of self-interest by the two cooperating parties and a genuine sense of commitment to the success of the enterprise developed at these two institutions from developed and developing nations. There was a clear vision of the objectives of the cooperation and there was efficiency in the allocation of the donor assistance and the resources of the Institute and ISU to the achievement of results consistent with these objectives.

The ARETMeC project was implemented using a five components structure: research and data base development; education, including the B.Sc. and Diploma programs; training directed at both the practitioners in Egyptian agriculture and agribusiness as well as the Institute faculty and staff; media and extension, preparation of materials, and the organization of conferences and workshops; and the Post Harvest Center.

Results for the HIAC/ISU project

The indicators of the success of the cooperative project between HIAC and ISU are important for the future of reforms in the agricultural and agribusiness sectors in Egypt, but as well for assessing the impacts of this higher education institution building effort. The results are summarized by the above-mentioned five components of the ARETMeC project.

The research and data base development component

A research unit has been formed within the Institute. Professors and contributing experts provide training on research methods and undertake joint research in the fields of agriculture and food systems development. Modern Internet connections have helped this unit conduct timely, policy-oriented research in cooperation with the ISU faculty and staff. Research topics and results have included assessments of the efficiency of the food processing and distribution sector; trade analysis for support of the import of staple foods and the export of high-value crops and products; efficiency of irrigation systems in the New Lands; cropping pattern changes with the onset of the economic reforms; cooperative restructuring; and marketing systems for the high-value crops. Workshops, national conferences and industry and scholarly publications have been used to disseminate the results of the research. In addition, the HIAC researchers are called on for advice on the changes in policy that are accompanying the market transition of Egyptian agriculture and agribusiness.

Education

The accomplishments of the education component are perhaps the most remarkable. A major restructuring of the curriculum as well as the materials to support the education of the students at HIAC was accomplished. These required the participation in training programs in the United States for up to one year by nearly all of the professors and department heads at HIAC. In addition, the senior professors studied the English language to assure access to the modern materials and concepts available for the western curricula adapted to HIAC. The dedication of the faculty at HIAC was critical to the speed and range of the change in the curriculum.

Changes completed at the B.Sc. level included revising, adapting, and modernizing the B.Sc. curriculum; training professors, assistants, and technicians; producing specialized materials and educational aides for the courses; introducing English language into the courses; increasing the amount of computer education; adding more involvement of students in research; and improving labs and practical training through the PHC and other experiential learning approaches.

Changes completed at the postgraduate level (diplomas) included adding three diplomas in English that are cooperative with ISU; on completion, students can transfer to ISU for the MBA degree. These diplomas are in agribusiness, accounting and finance, and education and communication. The existing diplomas in Arabic language have been enhanced and modernized to include materials that are consistent with the English language diplomas and to include concepts to prepare the students for the emerging market economy in Egypt.

After the implementation of the project, education and training changed in both method and substance. Outcomes can be measured in terms of the graduates from the education and training programs, all of whom readily find positions in the traditional areas of employment or in the growing private sector. The leverage on the investment in this institution building project is indicated by the following results. Every year, more than 3000 students graduate with the B.Sc. degree and 150 from postgraduate diploma programs, all qualified with the up-to-date curricula and technical skills necessary for success in an agricultural and agribusiness sector that is increasingly market oriented.

Training courses, whether for previous graduates working in the agriculture and food sectors or for authorities and organizations, are now regularly held. There are about 150 of these courses per year in a range of areas linked to the economic reform in Egypt, the outputs of the research program at HIAC, and new technologies related to computers and information systems. These training courses are attended by about 5,000 trainees per year. Programs for the preparation of trainers are also provided at the Institute. The training is in methods as well as in substance. About 250 persons complete these “train the trainer” courses per year.

Media and extension

Distance education and training have become a reality at HIAC as well as for Egypt. Media and extension methods have been combined with training and education efforts through the production of films and other support materials for training and education. Production of these materials has become permanently demanded by the extension organizations of the Ministry of Agriculture, cooperative organizations, and by the

private sector. These training and educational materials help HIAC partner with other organizations assisting the growth of agriculture and agribusiness in Egypt.

The Post Harvest Center

The Post Harvest Center has had a major impact on Egyptian agriculture, especially in New Lands and among agricultural producers and marketers. The focus of the training at the Center has been modern agriculture production and processing technology, marketing methods, and the steps necessary for better accessing of local and international markets. At present, it provides an applied scientific laboratory that supplements the mission of education and training of the 18,000 students at HIAC and those practitioners who come for short course and specialized programs.

Finally, it should be added that the enrollment at HIAC has increased significantly over the period of the HIAC/ISU collaboration. At the beginning there was an enrollment of about 12,000 students. The increase of 6,000 students was due in part to the attractiveness of the restructured education programs and in part to the confidence of the government officials who have increased the enrollment cap at HIAC.

This enrollment increased over a period when the tuition and fees at HIAC more than tripled. Egyptian students and their sponsors are willing to pay for this type of education. It is also of note that the qualifications of the students admitted to HIAC has improved, even with the increase in enrollment. In Egypt, students are placed in the higher education institutions by examination. The entering students have increased their median score about 20 percent during the period since 1992. In addition, the Institute is supporting the priority of the government for increasing the participation of females in higher education. Even though most of the students at HIAC still come from rural or agricultural backgrounds where the families are the more traditional, the enrollment of females at HIAC is now above 35 percent.

Lessons Learned and Implications for Other Nations and Institutions

The process of developing HIAC and the cooperation with ISU provide a basis for a number of observations regarding collaboration that may be of use to other institutions in developing and developed nations. These range from relationships with donors to relationships with the government of the host institution. As well, they concern how the process of cooperation unfolded. We review selected lessons learned by HIAC and ISU in the case of Egypt and the United States. Perhaps some of these lessons will prove to be enlightening for others engaged in the process of building and repositioning institutions of higher education.

Processes of cooperation

One of the particulars of the HIAC/ISU project was the way the donor funds were made available. These funds were from balances from U.S. assistance commitments over which the Egyptian government had principal control. There was a requirement for U.S. concurrence, but the funds were essentially under the decision of the Government of Egypt (GOE). Two implications followed from this situation. First, there was a conscious decision of the GOE about the project. That is, the project was selected by the GOE over other priorities. This made it difficult to compete for the funds. But those representing the interests of Egypt made the decisions. Second, continuing pressures for accountability were the result of the way the funding was made available. Each time the funding was renewed, careful documentation of prudent use of previous funding and tangible results were required.

A related aspect of the funding was that the allocations for the project came to HIAC, not ISU, as might have been the case if the project had been funded through normal development assistance channels. HIAC then subcontracted with ISU. Again, the primary responsibility for the funds was with the institution that had the most at stake relative to the success of the project. Priorities of the Institute were the driving force in the allocation of funds.

On the faculty and staff side, there was an almost immediate commitment of the senior faculty to learn English and to invest at their personal cost/hardship as well as the Institute's expense in long-term training. Four of the senior faculty came to the United States for a period of one year during the first year of the project. The language and the close association with the ISU senior faculty made it possible to work much more effectively in restructuring the curricula for the B.Sc. and diploma programs. Faculty members studied English, audited classes in their disciplines, and worked with a faculty team from ISU in developing the new curricula for HIAC.

The staff of HIAC was also involved in the out-of-country training. Here again, the participation of the staff in out-of-country training was different than it might have been had ISU been the lead contractor. It was recognized by the leadership of HIAC that the personnel of the Institute would have to take ownership if the project were to succeed, and at the pace planned. Giving the staff the opportunity to develop a better understanding of higher education in the West was, in the end, most helpful in getting the commitment and vision to move the project along. It was also a way to gain rapid acceptance of the new technology and the computer systems that were being acquired by the Institute.

Through the entire project, annual work plans were developed and approved by the Advisory Committee of the project. The Advisory Committee was made up on the Egyptian side of leaders in higher education, representatives of key ministries, and leaders from the cooperative sector. The Advisory Committee was useful not only in reviewing and approving the plan but as well in keeping the priority for the project high with the GOE. The U.S. members of the Advisory Committee were from the agricultural and food industry and from the ISU administration. The latter turned out to be important for the project, which was viewed as risky by the GOE. The fact that the project was supported at the highest levels of ISU made gaining the commitments in Egypt more feasible. The Advisory Committee met semiannually, once in Egypt and once in the United States.

On the curriculum changes, the project probably moved too fast. From the U.S. side, there was perhaps a lack of understanding of how the modern market and administrative science concepts would have to be adapted

to be successfully introduced into the HIAC curriculum. During the first year of the project, all four years of the curriculum for the B.Sc. as well as for the new diploma options were redone. Much of this work had to be revised as we better understood how to adapt the curriculum changes to the institutions in Egypt, the HIAC faculty and staff, and the backgrounds of the students. Still, the learning experience was ongoing for both sides and resulted in curriculum changes that were sustainable as well as an attitude of acceptance and willingness to change by the HIAC faculty and staff.

Finally, from a procedural side, there was a close working relationship and trust by the project leaders of the two institutions. Problems were openly discussed as was the strategy for moving the project forward. Both leaders participated actively in hosting the visiting faculty and staff. And, both worked as a team with the project Advisory Committee. There were times when both ISU and HIAC were significantly financially overextended to keep the project going. These risks were taken with significant downside implications for the project leaders had the project funding not been secured.

Institution building

From the perspective of institution building, there were aspects of the project that preconditioned it for success. First, there was pressure on the agricultural sector of Egypt to reform and to perform. Agriculture was leading the reform in Egypt. This made it more feasible to keep the commitment of the GOE to the project. Rapid change was necessary in the agricultural sector. HIAC was a private Institute with the flexibility to adapt to support these changes. Second, from the modern development and growth theory, it was becoming apparent that human capital development was a key to reform and growth. There was a need to find a way to educate large numbers of practitioners and new entrants to the agricultural sector. The higher education institutions were a logical choice for this task.

HIAC had another feature that made the project more possible: it was essentially a private institution. With the severing of the official relationship between the cooperatives and the GOE, the Institute became private. HIAC was now a private institution of higher education but one with a long tradition in agriculture. In a way, it

had the best of both worlds. HIAC had an established position in the hierarchy of higher education in Egypt. But it was not tied to complex government regulation and the inflexibility of the agricultural faculties in the public institutions.

The Post Harvest Center was another move of the project that had significant implications. Again, this was undertaken with significant risk. The Center was in the New Lands and had to be built from the ground up. But, the move was important in signaling the change of the Institute and in moving the education of the students from a hands-off to a more hands-on approach. The Center also provided experience and participation in the actual marketing and distribution systems for food products. This was valuable to both the students and the faculty and staff.

The donor organization relationships were always somewhat strained. The project was not a part of the planned United States Agency for International Development portfolio for Egypt. USAID is a very process-driven organization. Having a big, visible U.S. project in Egypt that was not a part of their portfolio was a problem for the bureaucracy. For a while the project was mainly ignored. Then when it became a success, there was more acknowledgement. Still, even now the project is not seen as a part of the U.S./USAID programs in Egypt, even though it may be the most successful donor effort of the United States in Egypt in modern times. The lesson here is to work more closely with the donor organizations, making them a part of projects up front. Alternatively, the lesson may be to work within the host country and be sure that the project is consistent with their own priorities. In the end it is these priorities that drive the donor funds, fortunately not the latest fad of the development community.

The project is moving along currently with little subsidy in the form of donor or GOE assistance. This is because the Institute has the license to adapt its tuition to meet the costs of the higher quality education it is giving the students and trainees. This fiscal independence has been extremely important to the capacity of the project to sustain itself. All along the Institute was investing its own funds in the project. This prepared the Institute for the day when the project would have to be self-sustaining. Tuition was raised sharply. Fees for training were set to

cover costs. Computer labs were operated in off-hours to manage the cost of the depreciation of the equipment. In general, when the external support for the project was reduced, the Institute was able to carry on.

These observations are advanced based on our experience with the HIAC/ISU project. We offer them without claim that they will generalize. Still, with the major transitions to market economies underway in the developing nations, higher education institutions would seem to be a logical focus for donor support. These are the institutions that can provide the leverage necessary for support of broad and rapid change. They are also the institutions that have the faculty who are best equipped to filter the experience of the developed nations and find the concepts and contexts to support change in the economies of the developing nations.

Conclusions and Observations

We are optimistic about the possibilities of institution building as an approach to development assistance. Perhaps the time has come to globally revisit this initial development assistance strategy. If focused on higher education, it is consistent with the modern understanding of the process to stimulate economic growth and development. It is also an efficient way to import the kinds of different thinking that are associated with the transition from planned to market economies. Finally, there are real leverages associated with the reform of higher education institutions. As in the case of HIAC, the development assistance investment can result in large numbers of trained professionals coming into the economy and remaining there on a continuing basis. Viewed in this way, the cost of the HIAC/ISU project was small. Already, more than 21,000 graduates with modern training in economics, marketing, and the administrative sciences are assimilated into the Egyptian economy.

Institutions must resonate with the political, business, and academic cultures of the host nations. Here we were perhaps fortunate. The ultimate funding decisions were always in Egyptian hands. There was input from ISU, but the priorities of Egypt and the ways of making the changes were in the end Egyptian. ISU was more the technical assistance provider than the guiding light of the project. This resulted in a project that could be more fully

supported by the GOE and by the faculty and staff of the Institute and the students. It was the HIAC faculty that had the good read on how fast the changes in curriculum could be made without disrupting the course of study at the Institute. It was also the HIAC faculty that were instrumental in tailoring the new material for the curriculum in such a way that it could be learned effectively by the Egyptian students.

We look forward to a new era of cooperation between HIAC and ISU. We see this as occurring through distance education. The technology for broadband low-cost international communication is almost at hand. Trends toward distance education in the United States are resulting in the preparation of a number of portable web-based courses and degree programs. The similarities of the curricula at HIAC to the economics, business, and administrative sciences program at ISU make collaboration through distance education more feasible.

Last, we have invested in a restructured curriculum at HIAC. The change was from a curriculum that supported a centralized planned economy to one that better prepares students for success in a market economy. These kinds of economic reforms are underway in many of the developing nations. Why not use this experience and the curriculum more widely? Perhaps HIAC and the HIAC/ISU project could serve as one element of a multinational project to accelerate and institutionalize educational reform for agriculture and agribusiness in higher education in nations transitioning to market economies.

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Change in Agricultural Higher Education

Csaba Csaki

Change and leadership in agricultural higher education is a very important and challenging topic. The conference speakers and reaction panelists have presented many comments, examples, and stories on this subject. I have tried to organize my thoughts around three major points. First of all, I would like to address the subject of why change is needed and what are the triggers for change in agricultural higher education. Secondly, I would like to comment on the process of change itself based on the presentations made during this conference. Finally, I would like to discuss the management and the leadership of change and offer some conclusions in this regard.

Why Change is Necessary

Many speakers at this conference offered a lot of very insightful comments and presentations on the need for change. To summarize these comments, I would say that there are some general reasons why change is needed in agricultural higher education all over the world. These triggers are more or less uniform throughout the world, but, of course, we can see them most clearly in the case of developed countries.

Trends and phenomena such as advances in information technology, globalization, and not staying with the status quo have been mentioned by previous speakers. These are obvious reasons why agricultural higher education needs to change along with the rest of higher education. But at the same time, this conference has presented evidence that there are also specific reasons why agricultural higher education needs to be changed even more than some other aspects of higher education.

First of all, as was mentioned by many speakers, the agriculture industry is declining in importance in most countries. I was shocked recently to learn that in my own country, Hungary, during this year, the car industry will export more than the Hungarian agriculture sector. Ten years ago, Hungary had no car industry at all. And, of course, we could go further with these sorts of examples. The changing role of agriculture is a strong reason to change agricultural higher education. It is also related to the fact that traditional agricultural subjects are being integrated with a set of additional subjects—food science, agribusiness, rural development, biology, biotechnology—all related to agriculture and are surely covering aspects previously covered in a traditional agricultural education. So, I would suggest that traditional agricultural education is also a declining industry. I think that is the most important specific reason for change in agricultural higher education.

This issue came up during our conference, but it has not received adequate attention. We were talking more about the obvious general reasons. I think that all of us, and especially the members of this consortium, have to pay more attention to the way in which the topic of agricultural higher education is packaged and presented. Agriculture or rural development? Agriculture or food science? Perhaps even the name of the consortium should be revisited on this basis. I think this is more important than changing the focus of the consortium by including research and education.

If we talk about change beyond these general reasons, there are a number of region-specific reasons why change is needed. We must understand that the content of the change is not necessarily the same in all regions of the world, though the general tendencies occur everywhere. For example, for countries in transition, obviously, there is a need for change there because of these general reasons. Right now, however, the main pressing issue is to adjust the system of agricultural higher education to suit the changing system of the economy and the management of the country. Institutions in transition economies should implement these changes in a way that allows them to cope with the global tendencies as well. But they need to change primarily because their environment changed dramatically and they do not fit the new environment or the requirements of that emerging new system. Traditionally, these countries have always separated their research and educational programs in different institutions. These programs are still focused on production and technology. There is little quality control. There are serious financial problems.

We might say similar things about the developing countries of the world where, again, all of the general tendencies occur. In developing countries, the main reason for change and moving ahead is really to create a system that is sustainable and to help the developing world solve its problems in institutional capacities, in human capacities, and in financial capacities.

In general, there are some overarching problems common to all institutions. However, there are definitely some specific local issues critical to the change process. Therefore, when we talk about change, we have to seek the right balance between general components of the change and the specific conditions in a given region. That is why I tend to agree with those who say that it is very difficult to copy foreign models in this change process. One can learn from all processes and from all examples, but solutions have to be local. They must be studied and suited to local conditions.

The Process of Change

Another subject that arose during this conference is the process of change itself. What is involved in the change process? We have received a very good list of subjects from the case studies and the speakers' presentations in this regard. Obviously, I would begin the process with the highest priority: the need for refocusing teaching activities. This idea comes from the statement that I made earlier about broadening the curriculum of agricultural education. On the one hand, genetics, biology, and biotechnology should enter. On the other hand, natural resource management and environmental issues are inseparable from agricultural education. Finally, management, human aspects, and rural development are also essential parts of a new agenda and a new curriculum for agriculture.

Another subject that we discussed is the redesign of programs and the management of the agricultural educational process. I don't want to repeat the many good points which were made in this regard. I fully agree with those who emphasize that the teaching process as a whole needs to be less specialized in order to provide a good foundation for a flexible career for the students. I also agree that the development of personal capabilities and satisfaction of individual needs should receive higher priority in the teaching programs. I believe that modular training with many electives from which the students may choose is in the best interest of students.

The third issue, institutional and organizational reform, is one of the most difficult ones. And, on this issue we have not reached consensus as we have on some other issues. Many aspects of this theme have been addressed by previous speakers. First of all, it has been mentioned, but not discussed in detail, the special value of multidisciplinary universities. There are colleagues at this conference who come from an agricultural college at a multidisciplinary university, and there are several rectors of specialized agricultural universities. Although I do not want to draw any conclusions in this regard, I feel that the current global trend is toward multidisciplinary universities. We have to accept this trend because attending a multidisciplinary university offers students a lot of advantages compared with a specialized institution.

A second organizational and institutional issue is the relationship among education, research, and extension. Of course, for many countries, this does not seem to be a problem. In the United States or Western Europe there are institutions in which all of these activities are integrated in a proper manner. But this is not the case in all countries. For example, in my own part of the world, Central and Eastern Europe, one of the major problems is still the separation of research and education. I would argue that this institutional separation wastes resources. I would also suggest that this is a very important issue requiring additional discussion.

Under the theme of institutional and organizational reform there is also the issue of internal reform of the institutions. Again, many speakers have commented on this subject, but I would just like to mention a few items. Dr. Richard Foster, underlined the importance of quality control and accountability. There is a need for the creation of quality control and accountability mechanisms inside our institutions.

There is also the issue of democracy inside the institutions. This is a difficult subject because you can make mistakes very easily. You find in Central Europe a kind of university structure in which students are sitting in the senate and making critical decisions with only part of the faculty involved, on subjects that they are not obviously competent to decide. But, of course, it was a good move to include them. The practical aspects of internal democracy issues should receive more attention. In addition, policies and procedures for promotion and evaluation of faculty members is an area in which a democratic and merit-based approach is vital. These are very, very important issues and should be included in the change agenda.

Another aspect of the change agenda is the method of financing institutions of higher education. To some extent this conference presented an optimistic picture. However, I do not think that the financing of agricultural higher education is in good enough shape worldwide that we can sidestep this subject as we have done at this conference. Of course, we were talking about success stories. Obviously, those who managed these successful reforms were able to get funding. Yet, with the decline of agriculture and with the crisis of traditional agricultural higher education, there is also a crisis of financing in many countries. Funding for agricultural higher education is in relatively good shape in places such as the United States and in Western Europe. If we go beyond the industrialized countries, however, we have to accept the fact that financing is a real problem. Just saying that these institutions should involve the private sector is not the solution in those countries. In the lesser-developed parts of the world, the governments cannot avoid partially funding higher education.

There is also a need for special attention not only to agricultural higher education but to higher education in general. The world is not only a world of growth; there are declining economies in the world as well. In declining economies, just to maintain and safeguard certain institutions is an immense task. In many parts of the world there are basic financial difficulties in agricultural higher education. The lack of change in these systems is not because they do not want to change or are unable to explain what they want, but because of severe financial constraints. If the gross domestic product (GDP) in a country has declined by 40 percent in 10 years, there is no money almost anywhere in the system to finance big projects or even to maintain a minimum level of operations. So, I think that this safeguarding function is also important and we should not forget about it.

And, finally institutional change involves globalization, a move toward a global system. Many speakers commented on this subject. This consortium can play an increasingly important role in facilitating this process and helping to identify and communicate new trends, as well as the needs of a changing agricultural higher education for a global international audience.

The Management of Change

Obviously, change needs to be managed and universities need to be managed. There have been many statements to the effect that change cannot occur without devoted and appropriate management. There is no more vital function in a university than appropriate management and leadership. Many important and useful conclusions were made in this regard, such as those offered by Dr. Ramon de la Peña Manrique. He and others identified very clearly the management aspects of their success such as vision, energy, and ability.

I would like to stress one point which did not get enough attention, and that is teamwork. Major or minor institutional change cannot be managed without a team. Change cannot be implemented by a university president acting alone. There is a need for a group of devoted people who are ready to work for this change. And, of course, that immediately brings the incentive issue into the discussion. We need not only champions, but champions who are ready to work continuously and work for a sustained change. Based on my experience, I believe that leadership is extremely important but must be coupled with resources and a team working together toward a goal. This conference has provided a good list of the potential pitfalls of institutional management: isolation, inbreeding, provincialism, inadequate quality control, and so on. I believe that if our consortium will continue to work on the leadership subject, we will be able to further analyze useful case studies.

At this conference, we have heard examples of two clearly different models of managing agricultural higher education. One is more or less the U.S. model in which institutions are led by professional managers. Their tenure might be only four years on the average, but they are professional managers. The second model is common in Europe and many other places and is based on elected management. I believe that the elected leadership has a higher risk than a well-selected professional manager, and that is the reason why universities in my region are generally poorly managed. There are exceptions, of course, and there are good leaders everywhere who bring about visible results. I think first of Professor Dmytro Melnychuk who provides leadership for the National Agricultural University of Ukraine, which is one of or perhaps the leading agricultural institution in the

Commonwealth of Independent States. I do not want to downplay the importance of the others, but nevertheless, leadership is elected. When we talk about management issues, we should pay attention to this fact and perhaps be a bit more accepting of the professional management of universities.

Conclusion

Finally, using the privilege of representing one of the sponsors of this conference, I would like to offer one final remark about the role of international organizations and donor activities. In terms of donor support, agricultural higher education receives much, much less attention than, for instance, agricultural research or other agricultural activities. To further exacerbate the situation at least in Central and Eastern Europe, there is a kind of jungle of donor activities that are not always appropriately coordinated and in some cases, even compete with one another. For example there is the United States Agency for International Development (USAID), European Union TACIS Program, the German government's international development agency (GTZ), the British Council Know How Fund, the Canadian Fund, and others I could cite. The forum provided by this Consortium can offer an opportunity to bring these donors together and have a discussion with them. We could tell them our agenda and try to facilitate a higher level of coordination.

I believe that this conference indicates that agricultural higher education is ready to face the challenges of fundamental change. I am also convinced that agricultural higher education will reach a new level of development where we will be able to supply more competitive and better-trained experts for all countries.

From Local to Global: The Challenge of Change in Agriculture and the Food System

Richard M. Foster

I would like to congratulate those attending this conference on coming together from universities around the world that have a food and agriculture focus. I have had the opportunity to listen to many of your comments and am intrigued by the passion you bring to the agricultural issues of your countries and by the consistency of the issues that concern you, coming as you do from so many different parts of the world.

Being the last speaker of the conference has given me an opportunity not only to listen and learn, but to change the text of my speech to comment on your comments. There are many consistent themes in your presentations. Certainly, the context changes because we are from different geographic, economic, and political environments. But here are the things that I heard you say:

1. There is a drastic need to address food supply and food security issues as your institutions look to the twenty-first century.
2. There is a need for a multifunctional agricultural sector that not only provides adequate food and nutrition but also contributes to the health and well-being of our rural communities and national economies.
3. There are concerns about the environment and natural resource development.
4. Rural economic development is desperately needed to keep people on the land.
5. There is a need for institutional change and for stronger leadership for institutional reform in your universities.
6. Navigating the new world of information technology and its expectations for distance learning and global collaborations presents new and unexpected challenges.
7. You continue to struggle with local issues even as you wrestle with the potential of globalization and being part of a global learning system.
8. Your institutions are impacted by continued dramatic swings in economic and political reform.
9. You have considerable issues with diversity and inclusivity, whether they are manifested in ethnicity or gender.
10. You wonder how you will prepare the food and agricultural professionals of the future to be responsive to a volatile and fragile global food system.

Kellogg Foundation Activities

The W.K. Kellogg Foundation has long been a supporter of higher education and of food and agricultural systems. Established in 1930, our Foundation focused on the health and well-being of youth and families in rural communities. It focused on creating an environment in which families could thrive, causing health, education, and agricultural systems that provided a safe and nutritious diet to become the programming objectives for the Foundation. The mission of helping people help themselves established in 1930 remains the mission statement today.

Through the years we have continually demonstrated our support of higher education to use knowledge in the service of people. Outreach and the application of knowledge to the problems of people have been our focus. We helped establish the Kellogg College at Oxford for extended education and lifelong learning. We helped build 17 outreach centers that contribute to continuing education and lifelong learning throughout the United States, as well as in Honduras and Costa Rica.

We sponsor Salzburg seminars that often focus on the role of higher education in the future. Past seminars have focused on building new higher educational systems in South Africa and have looked at Eastern Europe and the effect of the rapidly changing political climate on future higher educational systems there.

We have been active in southern Africa, especially South Africa, Zimbabwe, Swaziland, Botswana, and Lesotho. Since 1985, we have supported several thousand Africans in attaining their baccalaureate degrees. As Dr. Chris Igodan suggested, both the Kellogg and Rockefeller Foundations are jointly supporting the IDEA program—capacity building for smallholder agriculturists in South Africa and Zimbabwe.

The Kellogg Foundation also has supported higher learning in the areas of health and education in Latin America and the Caribbean since 1938. Throughout the United States, we have been strong advocates of state and land-grant universities and have helped to catalyze the community college movement in the late 1960s and early 1970s. We have exhibited a strong commitment to institutional change in higher education, investing

more than \$200 million over the past 10 years in higher education throughout the world. We believe that higher education is a critical component of our twenty-first century society. We also believe that higher education is about connecting knowledge to communities. And that's why we support it so strongly.

In addition, we have a natural niche in the food and agriculture and rural development philanthropic efforts throughout the United States. We believe that our rural environment is a national treasure that needs to be nurtured and preserved so that it may serve the entire population whether they live in rural or urban settings.

Principles of Change for Higher Education

We are all faced with the challenge of change, whether we want to be or not. If we are not actively pursuing institutional change in our universities, we are already significantly behind the times. The world will not let us be complacent. It demands change, and it demands that higher education be responsive to a changing environment.

I would like to share with you some of the higher education change principles that we have learned over the past several years. I think they may be of interest, and many of you have alluded to them during this conference.

1. **In order to change a system, you must start everywhere at once.** That is, top-level leaders and leaders at the program level must work in concert around a shared vision. To put it another way, in changing a higher education system you must address structural issues, curricula, resource allocation, access, collaboration, technology, and other variables that will influence the change you desire.

2. **Change must be value based and vision driven.** Vision and values must be determined in collaboration with the stakeholders, and the vision must be that of a preferred vision, not just trend driven. Being value based and vision driven is even more essential in times of rapidly changing systems that come about during periods of technological innovation and revolution.
3. **When people and institutions finally realize that change is imminent, they will look for new models to replicate and emulate.** Therefore, we must provide an environment for experimentation and learning not only to inform ourselves but to model behavior for others.
4. **Diversity and inclusivity are essential for innovation and creativity.** We believe that change never occurs in the middle, but always on the fringes where diverse audiences and conditions interact.
5. **There must be a critical mass (but not necessarily a majority) for change to occur.** Many movements around the world have happened with a minority of the population, but that minority was a significant enough mass to make the change visible and real.
6. **Technology enables changes to happen more quickly.**
7. **Change must occur within the resource structure of the institution—not just from philanthropic funds.**
8. **For institutional change to occur, policy must be impacted, capacity built, and budgets reallocated to new and more relevant programs.**
9. **Knowledge exists in every community, in higher education as well as in business, government, and the people we serve.** We must utilize knowledge from all sources to address complex issues.
10. **There is strength and power in collaborations and partnerships that allow complementary solution finding rather than competition for scarce resources.**
11. **The role of public higher education is changing.** Since the end of the Cold War, we believe the role of higher education is nation building, no matter if one is in the United States, Eastern Europe, or Southern Africa.

Programs for International Change

The Kellogg Foundation is currently involved in a food systems institutional change initiative. We call it the Food Systems Professions Education initiative, and it seeks to answer the question, “How should we prepare professionals for a complex, volatile food system in the global environment of the twenty-first century?” Our underlying assumption is that agriculture is not only an applied biological science but has social, cultural, economic, and political impacts. Therefore, we must look systemically at the food and agricultural environment and the higher education institutions that purport to serve that sector of our society.

We started by creating a series of national models for institutional and community engagement around food systems and agriculture. Thirteen institutional grants were made to create these models in America’s leading land-grant universities. In all, 26 states are now involved in our initiative. We have approximately 29 land-grant universities, 150 community colleges, and over 100 state colleges and universities all trying to work together to create models of university and community partnerships focusing on food systems issues. We believe that we can change the way our universities address food systems issues by connecting them to the problems of real people in real communities.

We also instigated a comprehensive set of national support grants. One that was mentioned at this conference is the Kellogg Commission on the Future of State and Land-Grant Universities. In the Kellogg Commission, 25 land-grant presidents come together to discuss the key issues of transformation of higher education into the twenty-first century. Their discussion points include five topics: (1) Returning to Our Roots—The Undergraduate Student; (2) Returning to Our Roots—Access and Success; (3) The Engaged University; (4) the Learning Society; and (5) Creating a Responsive Campus Culture. The Kellogg Commission has become one of the most exciting change initiatives in the United States at this time.

We also have provided a grant to the Council for Agricultural Science and Technology (CAST) to work with 38 professional societies in food and agriculture related disciplines. Representatives of these disciplines are asking three pertinent questions: (1) How do you redefine scholarship to be broader than a refereed, research journal article? (2) How do you redefine membership requirements to create greater diversity and a broader membership base for the profession? (3) How does a single disciplinary organization contribute to multidisciplinary problems and issues in a global environment?

We have also provided a grant to the National Future Farmers of America (FFA) Foundation. The FFA is a kindergarten through twelfth grade public education program that provides food and agriculture instruction to approximately 800,000 young people each day. These youth are our future food systems professionals. By supporting new program innovations at K-12, we hope to create the seamless food and agriculture education program for the future.

So what has this work told us so far? What have we learned about how United States institutions can change significantly for the future? Our data tells us the 10 issues that have to be addressed as higher education makes the transition into the twenty-first century are the following:

1. Greater partnerships and collaborations between and among institutions and with the private sector;

2. Greater emphasis on sustainability in agriculture and community development;
3. Greater emphasis on learning rather than teaching as an organizing framework within the university;
4. Greater use of diversity and inclusivity in designing and planning future direction and programs;
5. Greater responsiveness to the changing demographics that impact both current services and future directions of our states and nation;
6. Curricular changes that better prepare future professionals for the challenges of a dynamic, global food system;
7. More flexible structures to allow faster response to the public agenda;
8. Changes in the faculty reward and incentive systems that allow both effectiveness and efficiency in responding to the public agenda;
9. Move to “outreach” as a parallel organizing framework to research for the future; and
10. Greater use of information systems and distance education technologies to expand both impact and access.

We believe that we live in an era of integration and disintegration; that is, new structures come together for functional purpose and then are disassembled when their usefulness is over. Our institutions must have that kind of flexibility in the future or we will be left behind. And how do we know whether or not we’re making progress? The challenge is to institutionalize such changes so that they become (1) the expected rather than the exception; (2) institutional policy as well as individual commitment; (3) rewarded rather than just highly regarded; (4) resourced by the people and organizations that find value in the work; and (5) assumed to be part of the ongoing, continuous, and dynamic change paradigm.

The verdict is still out, but institutional change happens in an evolutionary way, not in a revolutionary way. We believe that there is greater acceptance of these principles now than ever before. Peter Magrath calls us the Land-Grant Foundation, and I consider that a compliment. The Kellogg Commission is the current focal point for change dialogue in the United States and, more and more, throughout the world. “The engaged university” has become the battle cry of the new era of higher education that seeks to be a part of the social fabric of the people they serve. And, lastly, I am pleased to be asked to speak at a prestigious conference such as this one.

Conclusions

I will close with some observations. First, I believe that you are all stronger coming together as the Global Consortium of Agricultural Universities than you are as individual institutions. Collaboration adds value and saves resources.

Second, there is a direct relationship between localization and globalization. That is, you have to be responsive both to local issues that have global impact and to global issues that require local action. In reality, food systems are both local and global. They are systems nested within systems.

Third, the current graduates of our universities will be the food systems professionals of the next 40 years. And we will see even more dramatic change in that time. Will they be ready?

Fourth, complex solutions to the world food issues will come through a combination of factors rather than any single solution. We will have to rely on the sustainability of our natural resource base protecting our capacity to grow food in the lands that we have available to us. And this raises some real questions about the viability of our rural communities, the number of farms we need, the size of those farms, the economic impact, the renewable energy sources, and the question that drives the whole issue—where will new additional land come from?

Fifth, solutions will also come from scientific breakthroughs in biotechnology and genetically modified organisms, leading to questions about biodiversity and the structure of agriculture—who will control germplasms and genetic codes in the future? Who will control the food system for not only those who can pay for food, but those who cannot?

Our solutions will come from global collaborations and global systems of education and production. These consortiums will determine who will get the food and who will not in the global resource shortages that will hit this world within the next 35-40 years.

So I hope you will take the time to wrestle with these key questions and beliefs. I can assure you that many others are already doing so. In order to be prepared, I would ask you to be deliberate and purposeful about change. Base your changes on a preferred vision for your institution, for agriculture, and for the people who depend on you to provide the knowledge and support to address their problems. I hope you will base your changes on the contextual values that keep you grounded in the culture that protects your identity and integrity. I hope you will learn from the global community and contribute to its learning as well.

Building Leadership Capacity for Institutional Reform

Walter H. Gmelch

*There is something that is
much more scarce,
something rarer than ability.
It is the ability to
recognize ability.*

Around the world scholars and administrators alike speak about a great leadership crisis in higher education.

Blue-ribbon commissions and executive reports call for bolder and better college and university leadership. The search for solutions to the leadership dilemma leads us to thousands of leadership studies, most of which are contradictory and inconclusive. Leaders, the studies say, are born, not made—are made not born; possess distinctive traits—possess no special traits at all; emerge from the ranks of faculty—must be trained and developed; or must use power and influence—must merely manage symbols and the academic culture. In response to these contradictory statements, the Global Consortium of Agricultural Universities (GCAU) sought to explore four questions during this roundtable discussion group session.

1. In an era of institutional change and reform, what are the personal challenges academic leaders face?
2. What attributes should institutional leaders possess to be successful in leading reform?
3. How can institutions of higher education build the capacity for preparing these new leaders?
4. What areas of common interest should Consortium members work together on in the future to address these challenges?

Rarely do we study or even discuss these questions that impede our ability to attract and prepare academic leaders. Institutional searches for academic leaders are failing more often now than in the past; many searches are going into their second, third, or even fourth cycles. When positions go unfilled, bad things happen—institutions suffer from lack of leadership, colleges suffer from lack of representation, faculties suffer from lack of a strong voice of advocacy, states suffer from lack of connection and communication, and the profession suffers from the void that is at best temporarily created (Andersen, 1999).

Historically, academic leaders appear to have undergone a transformation from chief academic officer to chief executive officer with more emphasis placed on extramural funding, personnel decision making, and alumni relations. Increasingly, the vision of an academic leader (e.g., department chair, dean, provost, rector, and president) as a quiet, scholarly leader has been overtaken by this executive image of one who is politically astute and economically savvy. Some view the role of an academic leader as a dove of peace intervening among warring factions that are causing destructive turbulence in the college, a dragon driving away internal or external forces that threaten the college, and a diplomat guiding, inspiring, and encouraging people who live and work in the college (Tucker and Bryan, 1988). No matter what the view, today's leader in the academy resembles an academic species with an imperiled existence, as evidenced by an article in *Fortune* magazine:

Something bad is happening to [deans]. Their terms in office seem to get shorter. No more serene-looking Franklin Delano Deans reigning for decades, but plenty of troubled faces whizzing by, brass nameplates revealing that one lasted three years, another four. (O'Reilly, 1994, p. 64)

What is going on? Some conclude that colleges are almost impossible to manage well and that academics who are trying to run or repair them are getting “burned out and eased out with astonishing speed (O’Reilly, 1994, p. 64).” Edward Lawler, an organizational effectiveness scholar, comments: “Most deans now seem to fail. It is a terribly difficult balancing act.” This report will discuss the challenges, search for balance, leadership attributes, and ways to build leadership capacity in higher education for the future.

The Academic Leadership Challenge

Academic leaders typically come to their positions without leadership training; without prior executive experience; without a clear understanding of the ambiguity and complexity of their roles; without recognition of the metamorphic changes that occur as one transforms from an academic to an academic leader; and without an awareness of the cost to their academic and personal lives. The search for solutions to this leadership void leads us to realize that academic leaders may be the least studied and most misunderstood management position anywhere in the world. The transformation to academic leadership takes time and dedication, and not all faculty make the complete transition to leadership. The first part of this section addresses the question of personal challenges that academic leaders face and how they find balance in order to successfully make the transition to leadership.

The call without leadership training

To become an expert takes time. Studies of experts in the corporate world who attain international levels of performance point to the 10-year rule of preparation (Ericsson et al., 1993). In the American university, seven years represents the threshold for faculty to attain the status of expert in order to achieve tenure and promotion at the associate professor level, and another seven years for full membership in the academy. If it takes seven to fourteen years to achieve expertise in our academic disciplines, why do we assume we can create an academic leader with a weekend seminar? Does the Ph.D. represent a terminal degree, almost like terminal illness?

None of the participants in this conference roundtable (24 participants representing 14 countries) had systematic training for their academic leaders. In addition, of the over 2,000 academic leaders I have surveyed, only 3 percent have leadership development programs in their universities. As we all may now appreciate, we need a radical change in our approach to leadership development in higher education.

The call without administrative experience

The time of amateur administration is over. Department chairs, for example, often see themselves as scholars who, out of a sense of duty, temporarily accept responsibility for administrative tasks so other professors can continue with their teaching and scholarly pursuits. Nearly 80,000 scholars in the United States currently serve as department chairs, and almost one quarter of those will need to be replaced each year. Deans serve, on the average, six years and university presidents, four years. We have already established that opportunities for individual skill development through training are woefully inadequate, but what are we doing to provide leadership experiences to prepare our next generation of academic leaders? Even if we had systematic skill development opportunities available, if you asked managers where they learned their leadership abilities, most would tell you from their job experiences. In fact, a poll of 1,450 managers from 12 corporations cited experience, not the classroom, as the best teacher for leadership (Ready, 1994). One should not draw the conclusion, however, that formal training and education are of limited value because academic leadership training in combination with experience and socialization can heighten a faculty member’s appreciation for leadership and strengthen his or her motivation to develop leadership capabilities.

The call without understanding role conflict and ambiguity

Caught between conflicting interests of faculty and administration, trying to look in two directions, academic leaders often do not know which way to turn. They mediate the concerns of the university mission to faculty and, at the same time, they try to champion the values of their faculty. As a result they find themselves swiveling between their faculty colleagues and the university administration. In essence, they are caught in the

godlike role of “Janus,” a Roman deity with two faces looking in two directions at the same time. Although academic leaders do not have to worry about being deified, they find themselves in a unique position—a leadership role that has no parallel in business or industry (Gmelch and Miskin, 1993; 1995). To balance their roles they must learn to swivel without appearing dizzy, schizophrenic, or “two-faced.” They must employ a facilitative leadership style while working with faculty in the academic core and a more traditional line—authoritative style with the administrative core.

The call without recognition of metamorphic changes

Faculty spend, on the average, 16 years in their discipline before venturing into academic leadership (Carroll, 1991). After all these years of socialization, how do faculty make a successful transition into academic leadership? A national study of beginning academic leaders (department chairs and college deans) in the United States identified salient patterns that characterize the “metamorphosis” of faculty into administration. The change involves the following shifts:

Solitary to Social—faculty typically work alone on research, preparing for teaching and other projects, whereas leaders must learn to work with others;

Focused to Fragmented—faculty have long, uninterrupted periods for scholarly pursuits, whereas the leader’s position is characterized by brevity, variety, and fragmentation;

Autonomy to Accountability—faculty enjoy autonomy, whereas leaders become accountable to faculty in the department and to central administration;

Manuscripts to Memoranda—faculty carefully critique and review their manuscripts, whereas leaders must learn the art of writing succinct, clear memos in a short amount of time;

Private to Public—faculty may block out long periods of time for scholarly work, whereas leaders have an obligation to be accessible throughout the day to the many constituencies they serve;

Professing to Persuading—acting in the role of expert, faculty disseminate information, whereas leaders profess less and build consensus more;

Stability to Mobility—faculty inquire and grow professionally within the stability of their discipline and circle of professional acquaintances, whereas leaders must be more mobile, visible, and political;

Client to Custodian—faculty act as clients, requesting and expecting university resources, whereas the leader is a custodian and dispenser of resources; and

Austerity to Prosperity—although the difference in salary between faculty and administrator may be insignificant, the new experience of having control over resources may lead the academic leader to develop an illusion of considerable “prosperity.” (Gmelch and Seedorf, 1989; Gmelch & Parkay, 1999)

The metamorphosis from professor to academic leader takes time and dedication. Not all make the complete transition and, in fact, few department chairs become fully socialized into leadership.

The call without an awareness of the cost to scholarship

Academic leaders try to retain their identity as scholars while serving in administration. Not surprisingly, with 16 years of socialization in their discipline before entering administration, most academic leaders feel most comfortable and competent in their scholar role. In fact, 65 percent of department chairs return to faculty status after serving in their administrative capacity and therefore are wise to protect their scholarly interests. They express frustration at their inability to spend much time pursuing academic agendas. “Having insufficient time to remain current in my discipline” causes the greatest stress for department chairs and ranks third as a stressor for deans (Gmelch and Burns, 1994). Most deans and department chairs would spend more time on their own academic endeavors if they could, but find it virtually impossible because of the demands of leadership duties. If we are to build a sustained leadership capacity within our universities, we must address the issue of balance in the academic leader’s life.

The Academic Leader's

Search for Balance

What I dream of is an art of balance, of purity and serenity devoid of troubling or depressing subject matter... a soothing, calming influence on the mind, something like a good armchair which provides relaxation from...fatigue.

- Henri Matisse

In today's world many of us dream of balance and serenity, if not in our profession, at least in our personal life. Academic leaders are no exception. For many, work becomes their entire life. One price they pay when they accept a leadership position is an incredible time commitment—and the pressure to find balance in their lives. Their role brings with it an identity and self-concept that often dictates with whom they socialize, where they live, how long they retain their position, and what lifestyle they lead. Obviously being in a leadership capacity is an important part of their lives and provides them with pleasures as well as pressures.

But over the past two decades, pressures have begun to transform the once unquestioning academic administrator into an individual struggling to find a balance between total academic immersion and a fulfilled private life. Psychologists suggest that one cannot be unhealthy or ineffective in private life and still be an effective professional. As Robert Louis Stevenson once remarked, "Perpetual devotion to what a [person] calls his [her] business is only to be sustained by perpetual neglect of many other things."

Academic leaders' ability to develop a balanced lifestyle depends on how well they can make trade-offs between leadership and personal interests. Do they believe their private life is in balance with their professional life? Eighty percent testified that the lack of balance caused them moderate to severe stress. What price do department chairs, deans, and presidents pay for their venture into college leadership? Where will it lead? What are the benefits? What are the costs? What changes have occurred in their personal lives and are they satisfied with these changes? Can they find balance? Is there life after leadership?

Trade-offs: The leader's balancing act

What does research show us about academic leaders' ability to balance their lives effectively and what price they pay for their venture into leadership? The price depends on their ability to manage trade-offs between professional and personal pressures. A trade-off is defined as an exchange of one interest for another; especially, a giving up of something desirable (Greiff and Munter, 1980). What does research tell us about the ability to manage trade-offs effectively? This section combines the results of three research studies of 1,700 deans and 2,000 department chairs in America and Australia (Gmelch et al., 1996; Gmelch and Miskin, 1995; Gmelch and Sarros, 1996). The following are properties of trade-offs:

1. **Trade-offs from both professorial and private interests vie for the same resource—time.** Time pressures dominate leadership: meetings, heavy workload, deadlines, after work activities, excessive demands, and insufficient academic time head the list of top stresses. Although many complain that faculty are incessantly seeking financial resources, the real limited resource for leaders appears to be time. This problem exists because time is a resource in limited supply; time is inelastic and irreplaceable; everything requires time; every leader has the same amount of time; everyone wants part of their time; and most leaders are ill-equipped to manage time effectively.
2. **Trade-offs act much like a ledger; you cannot debit one side without crediting the other.** The relationship between professorial and personal time resembles a "zero-sum" game—all deans and department chairs have 24 hours in a day. Forty-four percent of the deans experience excessive stress from trying to balance their personal and professional lives.

3. **Too many trade-offs in one direction creates excessive time pressures and leads to stress.** What percentage of the stress in a dean's life results from the deanship? This question was asked of 1,700 deans across America and Australia. The result—60 percent of the stress in their lives came from their jobs. When asked about the nature of their stress, deans identified “imposing excessively high self-expectations” as the most significant time trap. This item proved to be the most predictive indicator of excessive stress for deans as well as department chairs.

4. **Trade-offs often change with the roles professors assume in the academy.** Most deans perceive themselves to be both faculty and administrators (62 percent); however, a sizable portion (33 percent) view themselves solely as administrators and only 6 percent perceive themselves as primarily faculty. This is in sharp contrast to recent studies of department chairs who primarily see themselves as faculty (44 percent) or as both faculty and administrator (52 percent). Only 4 percent of the chairs perceived themselves as primarily administrators (Gmelch and Burns, 1994). Therefore, as deans move from department to college administration, they drastically shift their self-identity to being primarily an administrator (4 to 33 percent). It appears that the more forcefully deans row toward the shores of administration, the more distant they become to their initial identity as a faculty member. Chairs, on the other hand, tend to retain their academic identity. In fact, most chairs (65 percent) return to faculty status after serving as department chair (Carroll, 1991). In this study only 17 percent of the deans plan to return to faculty status. The pattern for presidents and rectors is described by Moore et al., (1983).

5. **Deans find they have to trade their scholarship for duties in leadership.** Although deans characterized scholarship as a low payoff activity, many deans maintain their scholarship while serving as deans (Imig, 1998). The results of our study indicate that 60 percent of the deans rate their scholarly activity as lower than prior to becoming dean. Eighty-eight percent of the department chairs had less time for their scholarly activities, and the same proportion were dissatisfied with their reduction in scholarly productivity.

The Life Span of an Academic Leader

Given the trade-offs, stresses, and levels of satisfaction with leadership, have faculty become less interested in academic leadership? Are deans, in fact, serving shorter terms? In 1979, Abramson and Moss found that 63 percent of the nation's law school deans served five years or less, with an average tenure of three and one half years—a sharp decline from an average tenure of six years in 1970. A dozen years later Bowker (1982), found that deans served an average of just under six years and just a decade ago Andersen and King (1987) reported that exactly half of the education deans had been in office for five or fewer years with almost 20 percent in their initial year as dean. Our study of Australian deans also concluded that 20 percent were serving their first year as dean and 75 percent of deans had served for five or fewer years (Sarros, et al., 1998). In the United States we found the average length of service as dean was 6.6 years and 16 percent of deans were in their first year of service (Gmelch et al., 1996).

Given the diverse methodologies and multiple disciplines used by these studies, the evidence is not conclusive as to whether deans are serving fewer years or not. All indications are, however, that about one in five deans leave their position each year and they are serving slightly longer than a typical five-year term. *Fortune* magazine's assertion of the revolving deanship may not be too far from the truth. How, then, can we build the capacity for leadership development in higher education?

Dialogue on leadership characteristics and capacity

The 24 participants attending the Building Leadership Capacity roundtable session engaged in an extensive two-hour discussion regarding (1) the attributes and roles academic leaders should possess to be successful and (2) how participants and institutions can build the capacity for leadership in the future. Discussion highlights and related literature references are presented in this section.

Academic leader characteristics and roles

Before identifying any specific suggestions generated during the roundtable discussion, the group realized that the answer to the leadership attributes question depended to some extent upon institutional and cultural influences. Two examples of institutional influences on leadership were the method of appointment (appointed by administration, elected by faculty, or a combination of both) and whether the individual was hired from inside or outside the institution. With 14 countries represented at the session and 36 nations attending the Global Consortium, many different cultural perspectives on leadership needed to be considered. A question for further exploration would be whether we could identify leadership characteristics or attributes that are “context free.”

What do people look for and admire in their leaders? The answer, according to Kouses and Posner (1993), is credibility. The results of their surveys of thousands of managers over the last decade are strikingly consistent. In addition, our research of academic leaders in Australia and American produced the same results. We admire credible leaders—those who are honest (truthful, trustworthy, and ethical), forward-looking (decisive and provide direction), inspiring (dynamic, uplifting, enthusiastic, positive, and optimistic), and competent (capable, productive, and efficient) (Gmelch and Sarros, 1996). Participants in the session also identified similar attributes: stress resistant, flexible, skillful communicator (ability to listen), easy to work with, team player, visionary, academic competence, moral character, respected, and persistence to achieve.

But what do academic leaders do? Virtually every managerial book written lists and exalts the tasks, duties, roles, and responsibilities of administrators. Lists that are specific to department chair duties, for example, range from the exhaustive enumeration of 97 activities revealed by a University of Nebraska research team (Creswell et al., 1990), to the 54 varieties of tasks and duties detailed in Allan Tucker’s classic book *Chairing the Academic Department* (1992), to the 40 functions cited in a study of Australian department chairs (Moses and Roe, 1990). In our research, chairs identified four key roles—faculty developer, manager, leader, and scholar—and deans added two others—boundary spanner and program developer (Gmelch and Miskin, 1995; Wolverton et al., 1999).

In addition, several speakers at this conference implicitly made reference to roles academic leaders played in their individual cases: strategist with vision and task (Jischke); integrator of science and practice (Melnichuk); bus driver with a purposeful direction (Magrath’s reference to Israel’s Prime Minister); dream maker (de la Peña); policy maker (Kabat); coalition builder (Kasomekera); risk taker (Shousha, Johnson, and Anderson); change agent (Foster, Magrath, and Csaki); image creator; learner (McIntosh); and engaged leader (Jischke and Magrath).

Building the leadership capacity: An agenda for action

The session concluded with the realization that leadership talent on the global scene is scarce and the need for effective leadership in this time of reform has never been greater. As a result, the participants turned their attention to ways we can develop an agenda to build leadership capacity within institutions of higher education. Several action plans emerged.

1. Develop a web site to engage in continuing dialogue on issues of leadership development.
2. Create case studies on institutional successes and failures, on institutions that transformed themselves, and on ones that missed opportunities (see Keller, 1983).
3. Develop an international clearinghouse of programs on every continent engaged in developing leaders in higher education (see Green and McDade, 1994).

4. Develop leadership education materials for administrators, faculty, and students.
5. Study leadership skills, attributes, and roles critical for effective reform.
6. Publish materials generated from the above actions.
7. Conduct another session on leadership capacity at the next Consortium meeting.

From the corporate sector we realize that there are three principal approaches to leadership education: individual skill development, socialization of leaders' values and visions, and strategic interventions that promote collective vision (Conger and Benjamin, 1999). In higher education, leadership development is at a critical juncture. While the corporate world complains that they have simply progressed from the Bronze Age of leadership to the Iron Age, we fear that in higher education we may still be in the Dark Ages. We hope this Consortium will help shed some light that will lead us into the Building Age of our leadership capacity.

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Quality Improvement in Undergraduate Education

William I. Lindley

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

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

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

Participatory Curriculum Development

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

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

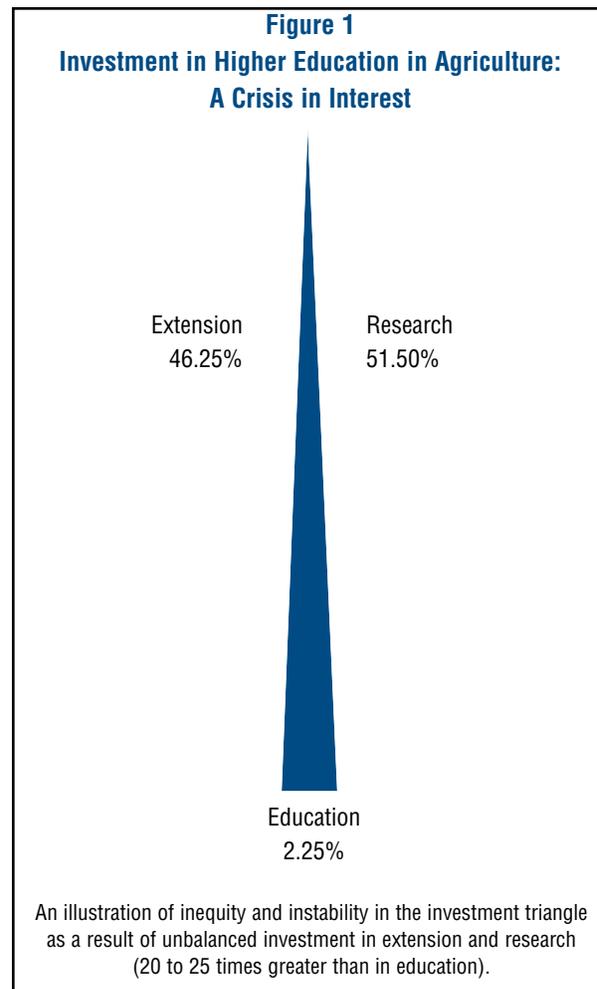
Investing in Agricultural Education

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

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

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

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



Educational Policy and Planning

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

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

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

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

The Quality Factor

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

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

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

Distance Learning

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

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

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

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

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

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Globalization of Teaching and Research

Francisco Escobar Vega

These roundtable discussions are considered very important by the organizers of this conference, due to the fact that the opportunities for discussion and exchange of ideas have been somewhat limited during the more formal presentations of this fruitful gathering. Therefore, the methodology for this session is very simple: we are going to have a dialogue. For this reason, long monologues are strictly forbidden. Fortunately, within our academic life, dialogue is a recognized tool of scientific growth.

It has been emphasized by other speakers during this conference that globalization is a fact of life in terms of communications, trade, and capital movements. We can add here a sort of global trend for migration from poor countries to developed ones. Globalization means challenges, opportunities, and also problems. The idea is to take advantage of this process in the best possible way, to increase the participation of all countries in the benefits of social and economic development.

Allow me to make some brief comments on this issue from a Mexican perspective. Our international trade is today \$250 billion a year. In the last five years, this has meant new technologies and important international capital coming into the country, new jobs, and new challenges in terms of quality control and well-trained human resources. One cannot forget that this tremendous change has taken place while we have been facing and solving our most difficult financial crisis of modern times: the so-called “tequila crisis.”

In terms of agriculture, our international agricultural trade has been increasing steadily during the last five years, but not at the same speed as manufacturing products. Our balance of payments is positive. Nevertheless, this important process has not yet touched 20 million Mexicans living today in a very painful subsistence economy. As a framework for this information, I should say that our country had 50 million inhabitants in 1970 and has 100 million today. Due to this demographic expansion, we now have, in absolute numbers, a larger peasant population today than we had several decades ago when we initiated the agrarian reform after the Mexican revolution.

The graduate agricultural school where I teach and am in charge of international affairs was established in 1959 to face production issues related to meeting the country’s demographic requirements. The concepts of agro-industry, marketing, and agribusiness, which are new priorities closely linked to the globalization process, were not then an important part of our teaching and research system.

We are trying to adapt ourselves to this new reality without ignoring the other side of the coin: our rural poor. This is not an easy task. I will give you some examples.

To deal with the need for teachers, we are sending graduate students to MidAmerica International Agricultural Consortium (MIAC) universities to be trained in food processing and international marketing. We need young professors and the sooner the better.

We are working together with Ohio State University to create a new program in agribusiness. The main goal of this endeavor is to answer the need felt by new Mexican agricultural entrepreneurs who are operating under the North American Free Trade Agreement (NAFTA).

We are fostering an exchange between American and Mexican agricultural business people. In September 1999, several Mexican agricultural entrepreneurs will participate in the Farm Science Review organized by the College of Food, Agriculture and Environmental Sciences of The Ohio State University.

Along with the Regional Organization for Plant and Animal Health (OIRSA), we are programming a set of short courses on international laws and regulations vis-a-vis food security and related matters in Latin America.

To strengthen the understanding of Mexico by American students, we are offering a summer credit course related to agriculture and international affairs within the framework of NAFTA. We hope that next year students from MIAC will participate in this endeavor.

In terms of research, we are trying to establish a joint venture to deal with the internationalization of environmental costs within the prices of tropical or subtropical agricultural products. We believe that this applied research, if done well, can have an important impact on the development of rural productive areas in developing countries. This research could help to elaborate the human and economic aspects of the agricultural globalization process.

Since the formation and training of human resources is an essential element of the agricultural issues within the globalization framework, the ideas that we can exchange here and their follow-up that we can agree upon could become another important effect of this conference. Such agreement will be a good example of working together for change.

Public And Private Partnerships

Barnabas M. Dlamini

The purpose of the roundtable discussion on “Public and Private Partnerships” is to identify innovative ways our universities could link with private businesses to accomplish common goals, promote corporate sponsorship, and develop engagement with and service to our clientele through outreach and extension. Public and private partnerships are defined broadly as a partnership that exists when the public sector (federal, state, and/or local officials or agencies) joins with the private sector (families, employers, philanthropy, media, civic groups, and/or service providers) to attain a shared goal.

Although each partnership is unique, they share some characteristics: they bring together public and private sector partners; partners work together towards shared goals or objectives; each partner contributes time, money, expertise, or other resources; and decision-making and management responsibilities are shared among the partners.

As we are all aware, universities worldwide have contributed significantly to their respective national economies as public institutions by providing human resources to those economies. At the same time, universities—particularly those in developing countries—depend almost entirely on government subventions for their sustenance. However, the nature, form, and operations of universities have to change in response to changes in the global economy if they are to be sustained and continue to be relevant to the development of their respective national economies. Thus, the need to form partnerships with business, industry, and civil society has become more crucial now than at any other time in the history of our countries, particularly in Africa. The training of graduates should be diversified and made more relevant to the needs of the wider society including the private sector. The ultimate goal of both universities and the private sector is the betterment of society.

Why Partnerships Between Public and Private Sectors?

Partnerships between business, industry, and universities are necessary for the development of common visions, goals, and objectives, as well as for shared responsibilities and accountability. The partners must work together to commercialize and exploit the research and innovations of the universities. The average African entrepreneur, for example, has little knowledge of the potential business opportunities that exist in the research laboratories of our universities. It is crucial that universities and industry work together to put the technical resources, business skills, and deep pockets of private industry to work to build new markets, new revenue systems, and new processes that will help us compete effectively in the global world economy. It would require the universities themselves becoming entrepreneurs. Companies educate, so do universities. Companies build markets and make profits, universities do not. But the two can come together to harness their strengths to create wealth. And in creating wealth through building and exploiting capabilities, universities and industry will be creating the stimulus for even faster transformation of our economies.

There is the issue of legalities and contractual arrangements in the process of partnerships that must be taken care of. These issues will include budgetary arrangements, intellectual property and publication rights, and so forth. All of these matters will require careful negotiation. But with common vision and trust, these difficulties can always be overcome.

Universities need to provide relevant programs that will enable business and industry to discharge their new roles as the engines of growth. Skills and competencies developed by our universities must serve not only the needs of industry today, because we know what those needs are, but also the future skills and competency needs of industry. Blaise Pascal, the brilliant seventeenth century scientist observed more than 300 years ago that, “Our achievements of today are but the sum total of our thoughts of yesterday. We are today where the thoughts of yesterday have brought us. And we will be tomorrow where the thoughts of today take us.” Pursuing this foresight will require close collaboration between the two arms of growth drivers to develop such relevant course programs.

Also, business and academia must work together to influence public policy. Academicians possess inestimable intellectual capabilities and creativity. They represent the diversity of disciplines necessary to analyze public policy implications. They have the breadth and depth of international experience to appreciate the process of policy development and implementation.

Partnership Options

Universities need to diversify their sources of information, enter into strategic alliances, be experimental, and mix boldness with prudence; they should also remember who must be in charge. The university must serve the future job market, not be a slave to it. There is need to seek new relationships, not give up one’s ultimate responsibilities. A conference of university presidents held in June 1999 in Accra, Ghana, produced a comprehensive list of ideas for partnership options, some of which are as follows:

1. **Use advisory boards made up of leading experts in a number of sectors to work with specific schools and departments.** Advisory boards should help deans and department heads to be more creative and open to new opportunities and should mobilize resources for special programs. This option in Swaziland resulted in a College (the Faculty of Commerce) built by the private sector for the provision of human resources for the commercial sector.
2. **Establish an office to promote internships with locally based, private profit and nonprofit institutions, as well as with government.** The office would assure that internships offered real training instead of slave labor, and that the training would be significant enough to extend university credits for successful completion. Such offices would establish the relationships, work out the contractual agreements, and monitor them for academic compliance. The Faculty of Agriculture at the University of Swaziland runs an internship program. The private sector pays the students while they are in training.
3. **Encourage research on the relationship of the state, the private sector, and civil society.** There are real problems to work out where creative thinking is needed. By raising the issues in research, and by promoting seminars on the results, one can help promote an atmosphere of jointly seeking solutions in which all sectors have a stake.
4. **Establish adjunct and visiting professorships with the private sector so that leading people from civil society, the profit sector and government become engaged in teaching at the university.** This approach has the advantage of spreading teaching loads while enabling good people to take the time to reflect upon what they are doing. Naturally, this is an investment in good will as well as in education.
5. **Give points towards final examinations or similar benefits for important community service by students.** The points would encourage students to work for the public good, as well as to pick up new practical perspectives as part of their education.
6. **Encourage students to become politically active by allowing them to elect representation to the university’s board.** Universities, in the best of circumstances, teach responsible governance through the classroom and through applied experiences.

7. **Develop research collaboration with the private sector to conduct joint research, or accept grants for specialized research in which the findings will enter into the public domain.** Carry the research idea further by helping to set up, in collaboration with the private sector, research centers near the university.
8. **Foster an entrepreneurial spirit aimed at either the public good (these are called social entrepreneurs) or the private good.** Courses can ask for earning projects in terms of proposals for an actual private sector or civil society initiative. In a number of institutions around the world, these concrete proposals have turned into start-up firms and community services. Private and nonprofit experts working with the professor should review these proposals. All would learn, including the professor. And the university's role as innovator and incubator of ideas would be strengthened.

Other links may include partnerships between a university from the North and a university from the South. One example is a collaboration between The Ohio State University and the Faculty of Agriculture at the University of Swaziland. The effort included amending the curriculum of the University of Swaziland's Faculty of Agriculture, launching attachment programs, holding professional faculty development workshops in teaching methodology, initiating a master's degree program in agricultural education and extension, and internationalizing faculty members at The Ohio State University.

The teaching and curricula-related workshops have resulted in faculty producing high-quality lesson plans and notes for their students as well as practical manuals for their laboratory classes. The partnership improved outreach programs at the University of Swaziland, which are of value to students, employers, and the institution training prospective employees. Field attachment programs were introduced to enable students to relate to the pragmatic operations of their chosen field of study, make career decisions, acquire skills of immediate relevance to the work place, and improve their job prospects after graduation, which could hasten promotion. Field attachment programs benefit employers by giving them an inside track for identifying, selecting, and hiring the quality of employees they desire.

Overall, the collaborative effort supported by the U.S. Agency for International Development has enabled both institutions to better their academic programs and helped the faculty to experience significant professional growth and better serve their formal students and outreach clientele groups. The professional horizons of faculty members have been broadened, the University of Swaziland has an improved capacity for outreach programs, and teaching strategies and programming at the university farm have improved.

Partnership with the informal sector may include offering courses, conducting workshops and seminars, establishing industrial outreach/extension centers and technology transfer offices, and supporting consultancies by professors, researchers, and students. Funding could be on a cost-sharing basis to ensure sustainable quality higher education.

Provision of certain types of infrastructures and services, such as vacation employment, fellowships and grants, equipment and facilities, endowment for staff development, book stores, health services, sanitary arrangements, transport, housing of staff and students, and catering services and meals.

Participants in the roundtable discussion may wish to consider these issues and share their experiences with private and public partnerships. Is there need to debate the issue of "why" have partnerships? But many questions still lie ahead. What options are available for effective partnerships? What happens in a country where the private sector is weak? What is the best way to manage partnerships? And, what experiences do people have with partnerships in the different countries represented in this group?

Leadership for Higher Education in Agriculture

July 22-24, 1999

Amsterdam Hilton • Amsterdam, The Netherlands

REGISTRATION INFORMATION

Located in the Conference Centre Foyer

WEDNESDAY, JULY 21, 1999

1400 - 1900

Registration

Dr. David Acker
Ms. Shelley Taylor
Iowa State University, USA

THURSDAY, JULY 22, 1999

0700 - 0900

Registration

Dr. David Acker
Ms. Shelley Taylor
Iowa State University, USA

AGENDA

All general sessions on Thursday and Friday will be held in the Ballroom.

THURSDAY, JULY 22, 1999

0900 - 1030

Welcome from the President of the Global Consortium of Agricultural Universities

Dr. Martin C. Jischke
President, Global Consortium of Agricultural Universities
President, *Iowa State University, USA*

Welcome to The Netherlands and Overview of the Wageningen University and Research Centre

Dr. Cees M. Karssen
Rector Magnificus
Wageningen University and Research Centre The Netherlands

Opening Keynote Address

Dr. Martin C. Jischke
President, Global Consortium of Agricultural Universities
President, *Iowa State University, USA*

1030 - 1100

Break

1100 - 1200

Session Chair

Dr. Walter Armbruster
Executive Director
Farm Foundation, Illinois, USA

Case Study: Europe

Dr. Dmytro O. Melnychuk
Rector
*National Agricultural University,
Ukraine*

Reaction Panel

Dr. Andrzej Babuchowski
*Olsztyn University of
Agriculture and Technology,
Poland*

Dr. Edwin C. Price
Assistant Vice Chancellor,
Texas A & M University, USA

1230 - 1430

Lunch

1430 - 1530

Session Chair

Dr. Mabel Imbuga
Associate Professor and Chair
of Molecular Biology and
Biochemistry
*Jomo Kenyatta University of
Agriculture and Technology,
Kenya*

Case Study: North America

Dr. C. Peter Magrath
President, National Association
of State Universities and Land
Grant Colleges, Washington,
DC, USA

Reaction Panel

Dr. Harald von Witzke
Chairman
*Division of International Trade,
Humboldt Universität zu Berlin,
Germany*

Dr. Chris Igodan
Dean
*Faculty of Agriculture, Fort
Hare University, South Africa*

1530 - 1630

**Poster Session and
Refreshments**

1630 - 1730

Session Chair

Dr. O. D. Mwandemele
Dean
*Faculty of Agriculture and
Natural Resources, University of
Namibia, Namibia*

Case Study: Asia/Pacific

Dr. Jia-an Cheng
Vice President
*Zhejiang University, Hangzhou,
P.R. China*

Reaction Panel

Dr. Frans Swanepoel, Director
Post Graduate School of
Agriculture and Rural
Development
*University of Pretoria,
South Africa*

Dr. Jorge Flores
Academic Dean
*Escuela Agricola Panamericana,
Honduras*

1830 - 1930

Reception

1930

Dinner

Welcome and Toast by
Dr. Martin Jischke
President, Global Consortium
of Agricultural Universities
President, *Iowa State
University, USA*

FRIDAY, JULY 23, 1999

0830 - 0930

Session Chair

Dr. Marietta Perez-Dlamini
Head
*Department of Agricultural
Education, University of
Swaziland, Swaziland*

Case Study: Europe

Dr. Ladislav Kabat
Director, Statistics Division,
FAO
Former Rector
*Slovak University of Agriculture,
Nitra, Slovakia*

Reaction Panel

Dr. Sophy Musaana
Director
*Kawanda Agricultural Research
Institute, Uganda*

Dr. David G. Topel
Dean
*College of Agriculture,
Iowa State University, USA*

0930 - 1030

Session Chair

Dr. Richard Wallace
Chancellor
University of Missouri, USA

Case Study: Africa

Dr. Zachary Kasomekera
Professor of Water Resources
Engineering and Former
Principal
*Bunda College of Agriculture
Lilongwe, Malawi*

Reaction Panel

Dr. Roger Steele
Professor
*Department of Education,
Cornell University, USA*

Dr. Walter Schiebel
Vice Rector
*University of Agricultural
Sciences
Vienna, Austria*

1030 - 1100

Break

1100 - 1200

Session Chair

Dr. S. Bisaliah
Vice Chancellor
*University of Agricultural
Sciences,
Bangalore, India*

Case Study: Latin America

Dr. Ramon de la Peña
Manrique
Rector
*Monterrey Campus, Instituto
Tecnologico de Estudios
Superiores de Monterrey,
Monterrey, Mexico*

Reaction Panel

Dr. Robert van Haarlem
*Wageningen University and
Research Centre, The
Netherlands*

Dr. Charles Maguire
*World Bank
Washington, DC, USA*

1200 - 1400

Lunch

1400 - 1500

Session Chair

Dr. Constantine Curris
President
Clemson University
South Carolina, USA

Case Study: Middle East

Dr. Fakhry Shousha
President and Board
Chairman
Scientific Society of Egyptian
Co-operators, Egypt

Reaction Panel

Dr. Sharon Anderson
Director
Extension Service, North
Dakota State University, USA

Dr. Marla McIntosh
Associate Dean
College of Agriculture and
Natural Resources, University of
Maryland, USA

1500 - 1530

Break

1530 - 1630

Session Chair

Dr. Evangelos Vergos
Dean
Dimitris Perrotis College of
Agricultural Studies,
Thessaloniki, Greece

Panel

Dr. Csaba Csaki
Senior Agricultural Advisor
World Bank
Washington, DC, USA

Dr. Richard M. Foster
Vice President for Programs
W. K. Kellogg Foundation
Michigan, USA

1630 - 1730

Summary and Next Steps

Dr. Martin C. Jischke
President, Global Consortium
of Agricultural Universities
President, *Iowa State*
University, USA

SATURDAY, JULY 24, 1999

0900 - 1200

**Topical Roundtable
Discussion Groups**

(30 minute break at 1030)

**Session I: Institutional Leadership
in Reform**

Chair:

Dr. Walter Gmelch

Dean

College of Education,

Iowa State University, USA

**Session II: Quality Improvement in
Undergraduate Education**

Chair:

Dr. William Lindley

Senior Officer

Agricultural Education,

Research, Extension and

Training Division

Food and Agriculture

Organization of the United

Nations, Italy

**Session III: Public and Private
Partnerships**

Chair:

Dr. Barnabas Dlamini

Pro-Vice Chancellor

University of Swaziland

Swaziland

**Session IV: Globalization of Teaching
and Research**

Chair:

Dr. Francisco Escobar Vega

Director of International

Affairs

Colegio Postgraduados

Mexico

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Global Consortium of Higher Education and Research for Agriculture

About the Consortium

Introduction

The growing challenge of feeding the world's population while simultaneously reducing environmental pollution suggests the need to actively seek effective solutions on a worldwide scale. Two critical contributions toward solving the aforementioned problem are training of highly-qualified professionals and research to solve key problems.

The significance of this issue is growing with each new achievement in biological, physical, or social science. Up-to-date technologies such as biotechnology, improved storage, intercontinental shipping, precision agriculture, and agroecological approaches to production lend themselves to further development through global cooperation in education and research. The application of science and technology is essential to solving world food problems. Training our future work force in these areas is a challenge for the 21st Century. Global cooperation can assist in the dissemination of developments in teaching and scientific research activities.

Political and economic changes in the world occurring within the past 10 years have eliminated a large amount of global confrontation among nations. Global cooperation offers a mechanism for tackling the aforementioned problems.

Background

On the occasion of the 100th anniversary of the NAUU, Kyiv, Ukraine, a scientific conference was held entitled, “*Globalizing Agricultural Higher Education and Science: Meeting the Needs of the 21st Century.*” Participants included over 400 representatives from 30 different countries. At the conference, the idea of a global consortium was born.

The three universities organizing the conference proposed a structure for a global consortium. They are:

- *Iowa State University*
(Ames, Iowa, USA)
- *National Agricultural University of Ukraine*
(Kyiv, Ukraine)
- *Humboldt University*
(Berlin, Germany)

Each of these universities pledged to identify and recruit other universities to participate in the consortium. At the conference, other universities from Europe and the United States stepped forward to join the Founding Committee of the Global Consortium of Agricultural Universities.

In 1999, the consortium held a conference in Amsterdam with the theme of Leadership for Higher Education in Agriculture. The Founding and Organizing Committees met at this time and made several important decisions:

1. **The new name of the organization** will be the Global Consortium of Higher Education and Research for Agriculture.
2. **An Executive Committee** would replace the Founding and Organizing Committees.
3. **Dr. Martin Jischke** would remain as President until the next conference scheduled for 2001.
4. **Dr. Dmytro Melnychuk** was elected as President-Elect and will take over as President at the conference in 2001.

Consortium Leadership

The founding president of the Global Consortium of Agricultural Universities (now Global Consortium of Higher Education and Research for Agriculture) is President Martin C. Jischke of Iowa State University of Science and Technology. Dr. Jischke is the President of Iowa State University and a professor of Aerospace Engineering. Dr. Jischke is also the past chair of the National Association of State Universities and Land Grant Colleges in the United States. Dr. Dmytro Melnychuk is President-Elect of the Consortium. Dr. Melnychuk is Rector of the National Agricultural University of Ukraine.

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Consortium Mission and Goals

The mission of the Consortium is to foster global cooperation for the improvement of higher education and research for agriculture as a prerequisite to solving the food security and environmental problems confronting our world.

The goals are as follows:

- **Development of a world system of cooperation** in higher education and research for agriculture utilizing conferences, working groups, and new information technologies to facilitate interaction on a global scale, and;
- **Support activities and close cooperation** with international organizations in the areas of international education, and agricultural research and development (UNESCO, FAO, TACIS, OECD, TEMPUS, USAID, etc.).

Objectives of the Consortium

- conduct international scientific conferences on topics of critical importance;
- share international models of curricula for training professionals in the field of agriculture;
- assist members in the reform and alignment of curricula for each specialization in agriculture;
- promote the exchange of faculty and students;
- provide assistance to universities in the reform of their organizational structure and activities;
- organize and promote working groups on topics of interest to members;
- organize international schools of professional improvement for university administrators and faculty;

- implement and disseminate up-to-date achievements in applying fundamental and applied sciences and information technologies in teaching;
- organize the publication of a proceedings of each conference; and,
- support the activities of existing international organizations such as UNESCO, the InterUniversity Conference of Agricultural and Related Universities, FAO, USAID, USIA, and special state and private foundations.

Organizational Dimensions of the Consortium

Management of the Consortium

Member universities, colleges, institutes, and associations in good standing will elect the Executive Committee of the Consortium. The members of the Consortium Executive Committee will elect a president-elect. These officers will operate as an Executive Committee. Details are available in the Bylaws.

Conditions for membership in the Consortium

- Membership will include universities, colleges, institutes, education associations, and international organizations devoted to the improvement of higher education and research for agriculture.
- Membership is open to any university or research institute in the world which trains professionals and/or conducts research in the areas of agriculture, forestry/natural resources, fishery, storage and processing of agricultural products, plant protection, veterinary medicine, and the social sciences associated with agriculture.
- Payment of membership fees (U.S. \$25/year).

Potential sources of funding for Consortium activities

- Donor support (UNESCO, FAO, OECD, USAID, EU, USIA)
- Membership fees of partner universities (annual membership fees)
- International grants and programs
- Donations (international foundations, individual donations)
- Payment for services rendered in reforming the programs of certain universities
- Loans
- Publishing activity