

# Status of Higher Agricultural Education in Ethiopia: A Review

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## Abstract

*The paper reviews the historical development of high-level manpower training in agriculture and its level of achievement, and the linkages between higher education institutions, research and extension programs. It also assesses the common problems facing institutions of higher learning in agriculture and related fields. The quality and relevance of programs, interconnection among all levels of agricultural education and training systems and the wider linkages with key stakeholders are given due emphasis. Competency of the faculty and quality of technical staff have been reviewed. In general, for institutions to be operational, it needs visionary and focused leadership, workable plan and good management. Low communication in science (bad practices in research report writing and in press) and low public confidence in new technologies have to be improved.*

**Key words:** Higher education, Key stakeholders, Competency of the faculty, Visionary leadership

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## **Introduction**

Agricultural higher education is critical to Ethiopia's economic development. To that end, the country must foster the advancement in agricultural education and in research output. As the country takes charge of its destiny with the increase of student population, quality of education would likely suffer. In terms of capacity, such as, availability of qualified instructors, supply of facilities, involvement in research and development, the universities in the country cannot attain the required standard. Indeed, the most critical is low level of funding from sources inside the country.

Currently, agricultural higher education is understood to include diploma level programs, first degree (B.Sc. and DVM), second degree (M.Sc. and MVSC) and Ph.D. degree programs offered in various institutions.

Thus, the objectives of the paper are to review the historical development of high-level agricultural manpower training, to evaluate achievement of high-level agricultural manpower training programmes, to examine the linkage of higher education in agriculture with research and extension, to assess the current status of higher-level agricultural education, and to identify the future challenges of higher-level agricultural education.

## **Historical Development of Agricultural Higher Education**

High-level agricultural manpower training in Ethiopia began in the early 1950s G.C. Since then, the agricultural institutions of higher education have made significant contributions to the agricultural sector through the training of high-level agricultural professionals, enhancement of indigenous research capability and generation and dissemination of technologies.

The history of higher education in Ethiopia has been marked by a unique development narrative in which science, technology and innovation has often been viewed as a preserve for a selected few rather than as tools for development. But this narrative has started to change since 2003 that African leaders are beginning to view science, technology and innovation as critical to human development, global competitiveness and ecological management. It is in this context that the findings and subsequent implementation and recommendations of the High-Level African Panel on Modern Biotechnology of the African Union and the New Partnership for Africa's Development should be viewed (NEPAD, 2007).

The seeds of change are being seen in the higher education in Ethiopia. For example, Ethiopia has embarked on reforming its socio-economic and political structure in line with free market economy and political liberalization since 1995. Education and training are considered to be vital agents in the achievement of the required development goals. This growing recognition of the crisis situation of education in the country (Tekeste, 1990) and its critical role in the development that led to the formulation of the New Education and Training Policy and Sector Strategy (EMPDA, 1994a; EMPDA, 1994B).

Ethiopian Peoples' Revolutionary Democratic Front (EPRDF) has made three significant changes in the higher education system:

1. Higher education expansion program has been implemented since 2000;
2. Teacher education system (TESO) overhauled since 2003; and
3. School practicum and student-center teaching approach was launched.

As a result, the number of university colleges and the enrolment rate has increased very rapidly in the past few years. However, there is little evidence

to confirm the improvement in quality of education due to high shortage of qualified and motivated instructors due to unbearably low amenities and massive student intake in institutions, which led to increased workload of instructors. Thus, this paradigm shift tends to affect the quality of education.

Empirical experiences have indicated that African education can be effective when focused on four important factors (Juma and Serageldin, 2007):

1. Educating Africa;
2. Developing tomorrow's wealth: biodiversity and sustainable development;
3. People power: towards better governance in Africa; and
4. Developing science, technology and innovation.

However, a host of factors have strangled the training process and the professional competence of agricultural graduates. Agricultural graduates were unable to respond to the labour market requirements and current rural realities due to lack of relevance of the curricula, which are no longer able to produce graduates who could deal with the wider problems of rural development.

In terms of capacity development such as qualified instructors, institutional facilities, leadership, research and development (R & D), all universities except for few are below the required standard (RUFORM, 2003). Moreover, a number of students who are among the top academic achievers (talented students) could not continue their Master's degree due to financial and social reasons. As the number of students increases rapidly, the quality of education increases inversely proportional due to lack of mentoring and resource related problems (study report on University of Jomo Kenyatta, 2006). Thus, quality

education in Africa in general and in Ethiopia in particular is the center of attention around which the whole development effort turns or rotates.

## **Background Information on Higher Education Reform**

At present, the agricultural education system in Ethiopia is understood to include University level education, diploma level Agricultural Technical and Vocational Education, and Farmers Training at farm level.

### ***Agricultural Institutions of Higher Education***

Agricultural Institutions of Higher Education (AIHE), as defined in this paper, include those institutions of higher education that offer at least one of the following training programmes in agriculture and related fields after successful completion of the secondary school curriculum (twelve years of elementary and secondary schooling): A two-year diploma Program training (two years of training) destined to produce essentially middle-level technicians in a variety of subjects; Undergraduate Degree Programme leading to a first degree (B.Sc./DVM) after three to five years of study; and Graduate Programs leading to a Master's degree (M.Sc./MVSC) and Doctoral degree (PhD.).

University level agricultural education in Ethiopia began in the early 1950s (alemaya.www7.50megs.com; Belay, 2000), following the 'Point Four General Agreement for Technical Co-operation between the United States of America and the Ethiopian Empire', which was signed in Addis Ababa on 16 June 1951. This agreement became the working plan and legal basis for the country's agricultural education programme. On 15 May 1952, the Agreement for a Co-operative Agricultural Education Programme between The Imperial Ethiopian Government and the Government of the United States

of America was signed in Addis Ababa. This agreement laid down the foundations for the establishment of the *Jimma* Agricultural and Technical School (JATS) and the Imperial Ethiopian College of Agriculture and Mechanical Arts (IECAMA) popularly called ‘*Alemaya* College of Agriculture’, now *Haramaya* University (AU). On the following day, 16 May 1952, another agreement signed between the Technical Co-operation Administration of the United States Department of State, now United States Agency for International Development (USAID), and *Oklahoma* Agricultural and Mechanical College, now *Oklahoma* State University, gave to the latter the mandate: to establish and operate the College; to establish and operate a nationwide system of agricultural extension; to set up agricultural research and experiment stations; and to furnish technicians and administrative staff to start the College (<https://oerafrica.org>).

Based on the then Emperor’s suggestion as well as the recommendation from *Oklahoma* State University, it was decided to establish the college at *Alemaya*, 525 km to the East of *Addis Ababa*. The academic programme of the College was modelled on the Land-grant College system with three fundamental but related responsibilities: training of highly skilled workers; promotion of agricultural research; and dissemination of appropriate technologies. The first class of JATS started in October 1952 and the first university-level agricultural training programme, with a 4-year curriculum leading to a Bachelor of Science degree in General Agriculture, started in September 1953 at the JATS. The JATS was to serve as an interim site where students complete their freshman and sophomore course requirements in the course of constructing different facilities at *Alemaya*. The IECAMA opened its doors to its first batch of students on 5 November 1956 (<https://tzadmission.net>). The original curriculum of the College was to

produce graduates with B.Sc. degree in General Agriculture. Gradually, however, adapting the training programmes to the felt needs of the country led to the introduction of new programmes of study<sup>3</sup>.

The IECAMA was originally conceived as an independent institution administered by a president with the advice and counsel of Trustees. With the establishment of the *Haile Selassie I* University, now *Addis Ababa* University (AAU), in February 1961, the College became one of the chartered units of the University and was renamed '*Haile Selassie I* University College of Agriculture'. The College functioned as a chartered member of the AAU till 27 May 1985 when it was upgraded to a university level as *Alemaya* University of Agriculture. Since July 1994, the AU has been governed by a Board of Trustees. In reflecting the diversity of the training programmes offered at *Alemaya*, following the recommendation of the University Senate in December 1999, the University Board renamed the University as *Alemaya* University (<https://www.haramaya.edu.et>).

Until the 1970s, university level education in agriculture and related fields was offered at *Alemaya* College of Agriculture, the Institute of Animal Health Assistants, *Ambo* and *Jimma* Institutes of Agriculture. The Institute of Animal Health was established in 1963 at *Debre Zeit* (50 km East of *Addis Ababa*) subsequent to an agreement reached between the Ethiopian Government and the Food and Agricultural Organisation (FAO) of the United Nations. The

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<sup>3</sup> The undergraduate training programmes of the university are now organized in eight faculties/ colleges. These are the College of Agriculture, Faculty of Business and Economics, Faculty of Continuing Education, Faculty of Education, Faculty of Health Sciences, Faculty of Law, Faculty of Technology and Faculty of Veterinary Medicine. Moreover, since the 1978/79 academic year the University has been offering postgraduate training in different fields of agriculture. At present, the University runs 14 M.Sc. and 4 Ph.D. programmes in various fields of agriculture.

institute granted a two-year diploma in Animal Health until this programme was phased out in 2004. It was patronised, first by the Ministry of Agriculture and then by the Commission for Higher Education. In 1989, it was made a constituent part of the Faculty of Veterinary Medicine of the *Addis Ababa* University.

*Ambo* and *Jimma* Institutes of Agriculture were primarily intended for training medium level agricultural technicians. The *Ambo* Agricultural Institute was established in 1931. It is one of the oldest institutions and the first agricultural school in the country to teach agriculture at primary level. Until 1966, the *Ambo* and *Jimma* Institutes were considered as secondary level schools taking in students who had completed grade eight and providing them four years of general agricultural education. In 1967, these schools became Institutes of Agriculture giving two years of diploma training in general agriculture and were administered under the Ministry of Agriculture<sup>4</sup>. In 1978, these institutes were upgraded to College of Agriculture level. The *Jimma* College of Agriculture was reconstituted as *Jimma* College of Agriculture and Veterinary Medicine in 2005 and upgraded as a faculty of *Jimma* University since the second half of the 1970s. Additional institutions were set up to teach agriculture. These include *Debre Zeit* Junior College of Agriculture (1953), *Awassa* College of Agriculture (1976), *Wondo Genet* College of Forestry (1978), Faculty of Veterinary Medicine of AAU (1979) at *Debre Zeit* and Faculty of Dryland Agriculture and Natural Resources (1993) at *Mekele* University.

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<sup>4</sup> The contract of the USAID expired in 1965, leaving all the activities of the JATS's in the hands of the Ministry of Agriculture.



## **TECHNICAL AND VOCATIONAL EDUCATION AND TRAINING IN AGRICULTURE (ATVET)**

The ATVET centres in their current form are of recent origin in this country. The great majority of the ATVET centres were opened in 2001. The Education and Training Policy of 1994 underlines that technical training would be provided for those who completed grade ten (the first cycle of two years of secondary education) to fulfil middle level manpower need of the country (TGE, 1994). In line with this policy, the first group of students had joined the Technical and Vocational Education and Training centres in 2001.

### ***Farmers Training Centres (FTC)***

Another component of the agricultural education system is the development of Farmer Training Centres (FTCs). It was intended to offer modular training programmes in order to upgrade the skills of farmers and to train youngsters on farm operation.

Another component of this program was short term training on community-based animal health care delivery system. For this purpose, it has developed new curricula and prepared guidelines for the training of community-based animal health workers (CAHWs). Communities select candidates who would serve as CAHWs and the training is conducted by a government-accredited trainer (MOARD, 2004). Under this program, the government intended to establish 15,000 Farmer Training Centres throughout the country, but had not been implemented due to unknown reasons.

### **Agricultural Research Institutions under Higher Education System**

Almost all agricultural higher educational institutions were engaged in research related to their professional areas of speciality. Faculties and graduate students are mostly required to engage in research.

In view with their performance, a number of achievements have been scored in terms of crop improvement, development of agricultural technologies, and improvement in animal husbandry.

As part of a move to strengthen the linkage between the agricultural research and extension systems and improve their performance, the Ethiopian Agricultural Research Organization was made accountable to the Federal Ministry of Agriculture and Rural Development in March 2004 (Getinet and Tadesse, 1999).

### **Policy Reforms on Agricultural Higher Education**

The need to reform the Ethiopian higher education system was initiated in 1994 when the Transitional Government of Ethiopia issued the Education and Training Policy (TGE, 1994). The policy has stressed on quality and relevance of the educational programmes, competence of teaching staff and quality of facilities, learning-learning processes, management and leadership, the funding aspects, income generation and cost-sharing by students, and the monitoring and evaluation system. Since the second half of the 1990s, a series of workshops and consultative meetings were organized among higher education communities, focusing on the reform agenda.

During the early part of the year 2000, other related policy documents were generated to make the curricula more relevant and responsive to the country's trained manpower needs both in quality and quantity. These include, the Rural

Development Policies, Strategies and Instruments (2001), the Ethiopian Sustainable Development and Poverty Reduction Programme document (2002), and Capacity Building Strategy and Programmes (2002). As a follow up, in order to operationalize the reform agenda, detailed strategies were developed. The Education Sector Development Programme II (MoE, 2002a), the Higher Education Capacity Building Programme (MoE, 2002b), the Higher Education Proclamation issued in 2003 (FDRE, 2003), the Higher Education Strategy Overhaul Committee of Inquiry into Governance, Leadership and Management in Ethiopia's Higher Education System (MoE, 2004) and the World Bank's working paper on Higher Education Development for Ethiopia (World Bank, 2000, 2004).

New legal frameworks for reform were created with the issuance of the Higher Education Proclamation (FDRE, 2003). The provisions of the proclamation include: guaranteeing increased administrative and financial autonomy to institutions; introduction of cost sharing in the form of a graduate tax; adoption of more business-like attitudes and practices by institutions; a move towards a new funding arrangement (block grant budgeting system using a funding formula); and the establishment of the Higher Education Relevance and Quality Agency (HERQA) and the Ethiopian Higher Education Strategy Institute (EHESI). ERQA is commissioned to develop standards of quality and relevance, evaluate programmes and institutions, and advise the Ministry of Education on issues of accreditation and recognition. Likewise, EHESI is entrusted with the responsibility of developing visions and strategic directions, analysing policies and strategies, and advising the government so as to make higher education compatible with the country's manpower needs (Shibru *et al.*, 2016).

It is too early to evaluate the outcome of the higher education reform which is being implemented in all IHE. Even though it is difficult to confirm the veracity of the reports during the regular bi-monthly consultative meetings, the heads of the public IHE have been consistently reporting that their institutions have been making steady progress toward reform. The regular bi-monthly consultative meetings convened by the Ministry of Education have helped board members, university administrators and staff members understand their roles in shared governance.

At the institutional level, as part of the reform process, institutions have been carrying out measures that include curriculum review (with due emphasis on practical training and ethical values and principles), shortening of the first-degree programmes by one year, expansion and diversification of programmes, rapid increases in enrolments, introduction of cost sharing, training staff members at M.Sc. and Ph.D. levels, and outsourcing on-academic services to private providers<sup>5</sup>. Institutions of higher education are also in the process of redefining their missions and embracing a culture of forward planning through well thought out strategic plans.

More precisely, institutions have been expanding their programmes in terms of student enrolments. New B.Sc. program (in all IHE), M.Sc. program (only in *Addis Ababa, Alemaya, Debub, and Mekele* Universities), and Ph.D. (only

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<sup>5</sup> With respect to the rapid increases in enrolments, the total enrolment in IHE has increased from about 25,000 (53.2 % regular and 46.8 % continuing education) in the 1993/94 academic year to 172,111 (76.3 % in public and 22.7 % in private and non-governmental institutions) in the 2003/2004 academic year (MoE, 1995, 2005). During the same period, the number of universities increased from two to eight. Similarly, the annual intake of the public higher education institutions which was only 6,503 (53.3 % diploma and 46.7 % -degree students) in the 1993/94 academic year increased to 31,921 (all degree students) in the 2004/05 academic year (MoE, 1995; Teshome, 2005b).

in *Addis Ababa* and *Alemaya* Universities) programmes, as well as a sizeable increase in enrolments of existing programmes. diploma programmes (two years of post-high school studies) were phased out from the university systems and taken over by regional government institutions. To accommodate the expansion of programmes and the rapid increases in enrolments, massive construction of infrastructures (dormitories, laboratories, libraries, classrooms, lecture halls, cafeterias, computer centres, offices and the like) and procurement of different items (equipment, facilities, furniture, textbooks and reference materials) have been carried out. To meet the surging demand for instructors that have been created by the expansion of the programmes and higher student intakes, employment of expatriate instructors has been pursued as a major strategy. The expatriates are expected to stay in the IHE until those staff members under training return and take up their positions. However, in all institutions the demand for qualified and experienced academic staff far exceeds the supply.

As already noted, one vital component of the reform process was curriculum review. The IHE were given the responsibility of revising and adapting their curricula to meet national demand for competent and skilled manpower as well as to respond quickly enough to changes in the environment and to the demands expressed by the ever-diversifying clientele of higher education. The process of Curricula revision and development was completed (often without the involvement of key stakeholders) in all institutions in 2003. However, it is important to note that revision and development of curricula should be a participatory exercise that involves all key stakeholders, including teachers, community members, employers (government, non-governmental organizations and private sector), former graduates, and students. One clear indication of the problem of developing curricula without the participation of

key stakeholders is the fact that the current curricula for two B.Sc. degree programmes (Animal Production and Health and Crop Production and Protection) aimed at meeting the human resource requirements of the Agricultural Technical and Vocational Education and Training Centres are on the process of being revised, only two years after their introduction. According to a recent review, the heads and staff members of the ATVET reported that the current curricula for these two programmes were not tuned to the needs of ATVET in that they were judged less relevant in terms of producing graduates with knowledge and skills required to staff ATVET (Mashilla *et al.*, 2005).

During the curriculum review process, attempts were made to include courses that promote competence, problem solving, good communication and entrepreneurial skills (as underlined in the Education and Training Policy). Practical attachment programme, internship, field practice, community oriented practical education that place students in the community for a period of 2 to 6 months, depending on the programmes of study, were incorporated into the curricula. In addition to providing hands-on practical training to the students, the inclusion of these types of practical training elements within the programmes of study was believed to have the advantage of forging closer ties with communities and making the programmes more responsive to their needs.

### **Achievements of Agricultural Institutions of Higher Education**

In recent years, agricultural institutions of higher education have been under increasing governmental pressure to make direct, visible, and relevant contribution to national research and agricultural development. More precisely, teaching, research, and outreach programmes of agricultural

institutions of higher education are expected to be in line with national strategies for meeting the challenges of food security, economic growth, and sustainable environmental management (Amare, 2004; Belay, 2004a; FDRE, 2002; Teshome, 2005a).

### ***Manpower Training***

Higher education of agricultural institutions have made contribution to the agricultural sector principally by providing agricultural education to fulfil the manpower needs in the agricultural research, extension and other support services.

### ***Research Outputs and Provision of Extension Services***

AIHE are expected to play a developmental role by establishing linkages with public, private and non-governmental organizations engaged in agricultural related areas and in rural development. AIHE have been involved in running agricultural research and extension of appropriate technologies, although there have been some differences in emphasis from one institution to another. However, AIHE is engaged more on teaching while some others take part in research and/or extension activities.

In addition to their direct involvement in agricultural research activities, AIHEs have been engaged in upgrading the professional skills of NARS staff through short-term, summer and in-service training programmes.

The principal drawback of agricultural research in AIHE system is that many research projects were developed based upon personal interests (with the goal of publishing results) and have been found to be less relevant to the basic and urgent needs of poor farmers (Amare, 2004; Belay, 2004a; Teshome, 2004). Of equal importance, but often unnoticed by the researchers, is the fact that,

in most instances, farmers have not been encouraged to take part in the identification of research problems. Moreover, researchers disregard the farmers' opinions, attitudes, customs, practices and priorities. In general, research efforts are expected to fall in line with the needs and pressing problems of farmers so that the technologies developed become more acceptable and meaningful to farmers.

Though it is mandatory for the faculties to get engaged in research, there is limited involvement of agricultural institutions of higher education in development-oriented agricultural research programmes. Among the factors hindering their participation in research were little incentives for university staff to do research, minimal linkages with users and potential clients, lack of coordination and execution of research at the AIHE. It is also important to note that until very recently, all institutions of higher education evaluated academic achievement of the faculty in terms of publishing research results in internationally recognized scientific journals. However, in 1997, universities took a bold measure to recognize and thus use locally-oriented research results (generation of improved technologies and practices that address local needs) for academic promotion purposes.

There is limited interaction among AIHEs and the different components of the NARS. The little collaborations and interactions that took place in the form of conducting joint research, attendance of periodic meetings of different committees, participation in research review workshops, involvement of the research staff in the academic programs of the AIHE (teaching courses both at undergraduate and post-graduate levels, supervising postgraduate thesis research work, and serving as members of board of examiners during thesis defence sessions). Most of the collaborations were among individual staff rather than among institutions.



Thus, the existing linkages between agricultural institutions of higher education and other components of NARS are weak. A review of experience from other countries shows that it is possible to design different mechanisms to improve these linkages. These mechanisms could take the form of utilizing research infrastructure jointly, institutionalizing and facilitating staff exchange by creating conducive atmosphere whereby senior NARS staff spend part of their time in teaching and supervising graduate students and convening regular consultation meetings and reviewing research projects jointly and encouraging joint research projects.

Available evidence shows that AIHE have traditionally engaged in agricultural research, but less in agricultural extension. However, during the past few years, outreach programmes by AIHE seemed to have gained importance.

With respect to the linkages between agricultural institutions of higher education and the national agricultural extension system, they take the following forms: conducting research on farmers need and development of methodologies, producing teaching materials, training extension workers/farmers/subject matter specialists, and upgrading the knowledge of the manpower for the national agricultural extension system.

## **Problems Facing Agricultural Institutions of Higher Education**

### ***Higher Education Center***

Staff and students in the vast majority of the universities face many obstacles on a daily basis. The most critical, among others, is low level of funding from sources inside the country. International organizations are predominantly

funding the research and development programs in many African regions (UNESCO, 2005).

A second obstacle is the distribution of higher education centers in the country and the standard of education. Though a number of universities are operational in recent years, more are required to accommodate the country's need. However, standard of education, especially in these recently opened universities, though not assessed properly, has not been optimal. Assessment by UNESCO (2005) seems to fit the standard of the universities:

- ❖ The number of articles published in scientific journals worldwide grew by 40% while declined by 12% in Africa (1998-2001);
- ❖ Knowledge creation through research and innovation is lagging behind the rest of the world;
- ❖ Translating knowledge into products and processes and modifying/adjusting them to respond to socio-economic conditions/needs is still low;
- ❖ Focus on building human and other capacity, particularly in science, technology and innovation is limited; and
- ❖ Economic, social and sustainable development cannot happen without appropriate infrastructure and human resource development on a large-scale.

In general, problems facing institutions of higher learning in agriculture and related fields differ from one institution to another and are very complex and diverse.

***Shortage of Highly Qualified, Competent and Experienced National Staff***

The ability of institutions of higher education in agriculture and related fields to attain their mandates is heavily dependent on the quality and experience of their staff. However, highly qualified and experienced teachers and researchers opted to work for the private sector, non-governmental organizations, NGOs, foreign organizations, or foreign universities/research centres. The main cause for their exodus is diverse, which include, among others, low faculty amenities, poor social services, and lack of recognition for research output and teaching performance. Because of the high turnover of experienced teaching and research staff, the transfer of experience and knowledge to junior faculty members has been disputed. Moreover, at present, there are different signs that point to the fact that most of those remaining in the higher education system have been involved in informal activities in view of supplementing their inadequate basic income. The involvement of teaching and research staff in informal activities is believed to impact on the quality of teaching and research output.

The current staffing situation in all IHE raises serious concerns related to the quality of research work and teachings. In fact, high turnover of experienced teaching staff, coupled with a sharp rise in the student population, forced the institutions to rely heavily on recruiting young Ethiopians (with little or no teaching and research experience) and foreign nationals. The IHE are now dominated by quite young national staff who are less experienced and foreign nationals who have little or no basic knowledge of Ethiopia. It must also be noted that in recent years, IHE have been facing considerable difficulties in recruiting even young academics, in most cases, they prefer to work for non-governmental organizations and the private sector offering higher pay and better working conditions.

It is to be noted that the higher education community appear to believe that in the higher education reform that is currently being implemented, there is an overemphasis on bricks and mortar (buildings, furniture, equipment, consumables, etc.) rather than investing in people (teachers, researchers) by adopting an attractive remuneration system and putting in place an enabling environment.

### ***Shortage of Supplies/Equipment and Inadequate Facilities***

The availability of basic materials and teaching aids, like photocopy machines, computers, audio-visual aids, etc. is very important in facilitating the activities of instructors and harmonising the teaching-learning process. At present, in most institutions, there seems to be shortage laboratory supplies and teaching facilities. In spite of the steady increment in the student population of the institutions of higher education since the second-half of the 1990s, classrooms, dormitories, cafeterias, health services and laboratory facilities have shown growth by opening more universities, but not to the level to absorb the demand. This has led to the utilisation of the existing facilities in excess of their capacity, in turn resulting in class congestion, difficulty in giving adequate attention to students, etc. (MoE, 2002a; MoE, 2002b; Belay, 2004a).

### ***Shortage/Lack of Library Materials***

Up-to-date and specialised literature and references are essential for the realisation of the different objectives of the institutions of higher learning. At present, most of the books and periodicals available in these institutions are very old, outdated, and of very limited relevance to the courses being taught. It is worth noting, for example, that training in improved agricultural methods and production management skills is among the most important activities of

institutions of higher education in agriculture. This, however, requires that the faculty keep pace with recent advances in their respective areas of specialisation and current, topical and specialised reading materials be easily available to them through purchase or borrowing. The current problem of library materials will be compounded if one takes into account the near non-availability of publications focussing on Ethiopia in all these institutions.

However, the current utilization of computers to access information has not been promoted to the extent required by staff and students.

### ***Weak Practical Training Component***

A closer look at the agricultural higher education system in Ethiopia reveals that most of the agricultural curricula have not been adjusted to the new requirements and demands for trained manpower in agriculture. Moreover, students of agriculture are given heavy doses of theory, without any exposure to real-life agricultural problems and environments similar to those they face after graduation. This is believed to have resulted in producing graduates who lack technical competence and professional confidence to work in the complex and changing rural environment (Amare, 2004; Belay, 2000; 2004a; Mashilla *et al.*, 2005). However, the demand for better-trained graduates has never been greater. In recent years, with the growing student population, the AIHE were forced to stretch their existing facilities to the limit. This proved to be particularly detrimental to the practical component of the training programmes. Thus, students would not be taught to appreciate the basic problems facing agriculture in contemporary Ethiopia; thereby not preparing them fully for what will be expected of them after graduation. Moreover, feedback from the AIHE reveals that because of budgetary limitations it was practically impossible to implement the practical attachment/community-

oriented practical education programmes as planned. It must be mentioned *en passant* that there is an underlying feeling among the higher education community that shortening the length of study makes the programmes too tight and the graduates will not gain enough practical training demanded by the job market

### ***Narrowly-focussed Programmes of Study***

Over the past twenty years, AIHE in developing countries have been under increasing pressure from governments and donors to reform the traditional disciplinary system, that focused on agricultural production and productivity, and embrace more market-oriented, demand-driven multidisciplinary systems approach, taking into account the complex requirements of agriculture and rural development as well as the changing needs and realities in the face of globalization (Lindley, 2000; Maguire, 2000; Willett, 1998).

It is increasingly recognized that in addition to courses pertaining to their areas of specialization, students of AIHE must take some important interdisciplinary courses which would help them understand the broad principles of agricultural production and rural development and would eventually prepare them in the best possible manner for the world of work. Some of the frequently suggested cross-cutting themes that all students of the AIHE must be exposed to include basic leadership development skills, interpersonal communication skills, agribusiness and marketing, demographic challenges, environmental protection, the empowerment of women, gender issues, sustainable development, participatory approaches to rural development, the role of indigenous knowledge systems, food security, computer literacy, and the effects of HIV/AIDS on the agricultural sector (Amare, 2004; Lindley, 2000; Maguire, 2000; Willett, 1998).

***Teaching Programmes with Little Reference to the Ethiopian Conditions***

Recent studies on Ethiopian agricultural higher education sub-system found that traditional agricultural higher education failed to respond to the labour market requirements and current rural realities due to lack of relevance of the curriculum, which is no longer able to produce graduates who could deal with the wider problems of rural development (Amare, 2004; Belay, 2000, 2004a; Mashilla *et al.*, 2005). The problem is compounded by the fact that standard textbooks and/or teaching materials relevant to the Ethiopian conditions are lacking for many of the courses taught in the AIHE. The absence of teaching materials which are relevant to Ethiopia, coupled with limited circulation of the results of the different research projects undertaken in the country, have led to the utilisation of western and mostly theoretical textbooks and reference materials. This has resulted in students not being exposed to the objective realities of their country and having little comprehension of the root causes of its backwardness, an awareness of which is required for economic development to take place in Ethiopia.

***Weak Inter-institutional Linkage***

The majority of the institutions of higher learning in Ethiopia today can be qualified as being introvert because of the weak relationships they maintain with sister institutions and other organisations. Consequently, this has seriously affected the inter-institutional ties. In order to correct these drawbacks, it is essential that institutions of higher education establish strong and firm linkages among themselves and also work in close collaboration with local or foreign academic and research institutions and development organisation in terms of: exchange of professional (educational and research) information; staff exchange and sharing; collaboration in research work;

effective use of financial & material assistance; participation in curriculum development, etc.

### ***Weak Connection with other parts of the Agricultural Education System***

The current agricultural education system in the country consists of disconnected programmes/training tracks leading towards different diplomas and professional careers (farmer training centres, ATVET, AIHE). The institutions that offer these programmes are under the control of different ministries and there is no or only little co-operation and communication among themselves. It is, therefore, advisable to move towards more integrated agricultural training programmes and institutional framework through which graduates of the lower training tracks would have access to join and pursue their studies at higher training tracks, if they so wish. Such an approach is also believed to enable the various levels of agricultural education and training to play complementary and reinforcing roles in order to meet the objectives of sustainable economic development, poverty alleviation, environmental protection, and food security at national, regional, local and household levels.

### ***Lack of Communication with key Stakeholders***

Regular contact with key stakeholders (employers and former graduates) and periodic tracer studies are essential elements that help identify the strengths and weaknesses of training programmes. Strong linkages with key stakeholders also help to recognize changes in the external environment and improve the quality and relevance of the programmes. At present, the AIHE in the country are not proactive in terms of adapting in response to changing needs and realities in the external environment as well as maintaining strong linkages with key stakeholders.



## **Future Challenges for Agricultural Institutions of Higher Education**

The demand for competent and experienced professionals has always been high in Ethiopia. However, supply has continuously fallen short of demand. The country's capacity to train higher-level personnel in agriculture is below current requirements. To address the problem of skilled manpower, the Ethiopian Government should engage in reorganizing higher education institutions, including expansion of higher education activities to more regions and increasing institutional independence. In the expansion process, the public IHE are expected to play a leading role in training high-level professionals. It is quite obvious that the envisaged increment in the number of students and the launching of new programmes of study would be a mammoth challenge to the public IHE.

It is increasingly clear that, in recent years, AIHE, like all IHE in the country, have been under pressure to enrol more students than could be effectively served. The surging number of students in AIHE, in the face of insufficient resources, is believed to have led to a decline in the quality of education (Amare, 2004; Belay, 2000, 2004a; Mashilla *et al.*, 2005). Shortage of highly qualified and experienced instructors, insufficient attention being given to research/knowledge creation and practical training, lack/shortage of teaching materials which are pertinent to the agricultural situation of Ethiopia, as well as teaching methods and curricula that have not been adjusted to the new requirements and demands for trained manpower in agriculture have made the situation worse.

Given this state of affairs, the fundamental challenge facing the agricultural higher education sub-system in Ethiopia is to transform itself in view of

adapting to the ever-changing external environment. It is therefore incumbent upon the AIHE to implement curricular reform measures, adopt student-centred creative learning strategies, and introduce more practical elements into study programmes so as to be able to produce graduates equipped with the knowledge, skills, values and attitudes required for promoting sustainable agricultural and rural development. This paper made it clear that one of the most important challenges facing AIHE is national staff retention. In this respect, it is high time for public authorities and policy makers to take into consideration the long-term effects of exodus of highly qualified and experienced staff to areas of higher pay and better working conditions. It is, therefore, important that concerted efforts be made to lure young and outstanding professionals into the higher education system and retain experienced teaching and research staff by providing better pay, working facilities, adequate incentives and competitive terms of employment. With respect to research activities of AIHE, it is imperative that they direct their research attentions to problems of local relevance and define their research agenda through interaction with all relevant stakeholders if they want their research efforts to mean anything at all to the society in which they are embedded.

## **Conclusions**

Studies carried out in many developing countries have concluded that investing in human resources development is essential for poverty reduction, efficient utilisation of available resources, and economic development. In Ethiopia, given the fact that there has been no tracer study, it is very difficult to quantify the real contribution of graduates in agriculture and related fields to economic development. However, one can safely say that institutions of higher education in agriculture and related fields have been, in general,

contributing positively to the national development efforts because, in their absence, there would not have been the progress achieved so far. This paper has identified common problems facing institutions of higher learning in agriculture and related fields, which need to be properly addressed if the institutions are to contribute their fair share to the agricultural development endeavour of the nation. In fact, in light of the many and varied challenges facing the AIHE, their response must be to go beyond the traditional ways of imparting too much theoretical knowledge and produce competent and confident graduates with entrepreneurial skills and abilities to deal with the wider problems of rural development.

The need for high-level agricultural manpower remains pressing and dire. In this respect, even though concerted efforts have been made in view of strengthening AIHE and improving their contribution to the agricultural development of the nation, over the last 10 years, mainly through procuring educational facilities, constructing additional buildings and employing expatriate professionals. A lot remained to be addressed, these include: national staff retention in the agricultural sectors; interconnecting all levels of the agricultural education and training systems; improving the quality and relevance of programs; developing wider linkages with key stakeholders, other AIHE, other institutions in other sectors, foreign universities and research centres; and forging closer ties with the labour market so as to ensure that AIHE are producing the kinds of experts demanded by the changing labour market environment.

With respect to agricultural research performance of AIHE, their contribution to the national agricultural research agenda is very marginal in research endeavours addressing national agricultural research priorities. It is, therefore, imperative to strengthen the research activities of AIHE and

improve their contribution to development-oriented national agricultural research programs. In this respect, some of the measures that need to be taken include the following: defining research priorities oriented to needs of users; creating budget for university research; providing strong incentives for conducting research; promoting multi-disciplinary research on societal problems; allocating realistic time to research, teaching and other activities. The national level of agricultural research and extension strategies need to recognize and define the roles of AIHE in research and extension. It is equally important that AIHEs formulate their research strategic plans taking into account national agricultural research priorities and relevant local considerations (preparation of research strategy outlining research priorities and how research is linked to users, other components of the NARS, and the teaching and extension programmes of the AIHE).

With respect to interaction between innovation and education, there are problems to be addressed. A paradigm shift in education innovation requires that qualified instructors/researchers should work in strong partnership across disciplines and sectors. Innovation in education is both a collaborative and an interactive process. Instructors/researchers should work with governments where necessary and across regions. Geography is no longer a barrier to collaborative work and technological application.

University and research facilities cannot be built overnight; even if a certain amount of finance is available, a high-quality, forward-thinking manpower and perfection in administration needs time to mature. Science, technology and innovation can come about through innovative and well managed partnerships between existing institutions and individuals at national and regional levels. Development of science, technology and innovation does not necessarily (always) require new buildings, but it needs, according to Norton

and Alwang, 1998, visionary and quick-thinking leadership, workable plans and good management.

Development of science, technology and innovation (STI) in education requires people empowerment (human capacity development). In Ethiopia, we may have people with the skills, experience and entrepreneurial ability, but we have to fuel them to maintain prosperity, growth and sustainability. Public attitudes to science and technology need to be studied for the reasons that technology or innovation acceptance is not a linear phenomenon. Low communication in science (bad practices in research report writing and in press) and low public confidence in new technologies have to be improved.

At the end, Ethiopia should have strong educational institutions to better prepare citizens to meet its developmental challenges and positively influence its future.

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## **Notes of Contributors**

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