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Empowering Agricultural Labour in Ethiopia: The Challenges to Training and Development

Kassa Belay *

Abstract: This paper reviews the historical development of agricultural education and training in Ethiopian institutions of higher learning. The review reveals that high level training in agriculture, which began in the early 1950s, has grown over the years. Today, the country has seven institutions of higher learning which train students in agriculture and related fields. The study shows that a host of factors, however, have put a stranglehold on the training process and the professional competence of agricultural graduates. Moreover, the results shed new light on the widening gap between the country's existing limited capacity to train agricultural labour and the ever increasing demand for highly skilled graduates in the sector. The study also reveals that the scarcity of highly qualified agricultural professionals, those with Bachelor's degree and above, has been accentuated and intensified through time.

Résumé : Le présent article analyse l'évolution historique de l'éducation et de la formation dans le domaine de l'agriculture au niveau de l'enseignement supérieur en Éthiopie. L'étude révèle que la formation au niveau supérieur de la main-d'œuvre agricole a commencé au début des années 50 et qu'à présent, le pays compte sept institutions d'enseignement supérieur pour la formation des étudiants dans l'agriculture et dans d'autres domaines connexes. L'étude montre qu'une multitude de facteurs s'érigent en obstacles au processus de formation et inhibent la compétence professionnelle des étudiants agronomes. Qui plus est, les résultats mettent en exergue le fossé qui s'élargit entre la capacité limitée actuelle du pays à former la main-d'œuvre agricole dans le secteur et la demande sans cesse croissante de plus de diplômés dans ce secteur. Par ailleurs, l'étude révèle qu'au fil du temps on assiste à l'accentuation et à l'intensification de la pénurie de professionnels agricoles hautement qualifiés, ceux-là qui ont obtenu leur Licence et autres diplômes supérieurs.

* Associate Professor of Economics, Alemaya University, P.O. Box 138, Dire Dawa, Ethiopia.

Introduction

This paper addresses issues of agricultural training in institutions of higher learning in Ethiopia, the demand for graduates from these institutions and problems affecting the training process. It is not the intent of this paper to undertake a comprehensive and exhaustive evaluation of high level agricultural manpower training in Ethiopia. The complexity and diversity of the training programmes involved would demand an examination of strengths and weaknesses of every institution of higher learning in detail. The purpose of the paper is, therefore, to glean through information from various sources so as to get a general idea of the total number of agricultural graduates and the most important insidious problems in the teaching-learning process.

Agricultural training, as defined in this paper, includes the following programmes offered by institutions of higher education after successful completion of the secondary school curriculum (twelve years of elementary and secondary schooling):

- Diploma Programme (two years of training) destined to produce essentially middle-level technicians in a variety of subjects;
- Undergraduate Degree Programme leading to a Bachelor's degree (B.Sc.) after four to five years of study;
- Graduate Programme leading to a Master's degree (M.Sc.).

The rest of this paper is organised in four parts. Part two deals with the historical development of higher level agricultural training in the country with particular emphasis on Alemaya University, Ethiopia. Part three reviews the origin and organizational structure of other institutions of higher education in agriculture and related fields. Part four identifies problems affecting the training of agricultural labour in the country. Part five explores the future challenges for institutions of higher learning in agriculture and related fields.

The Origin and Development of University-Level Agricultural Education in Ethiopia: The History of Alemaya University

One of the major obstacles for the rapid development of the agricultural sector in Ethiopia is the scarcity of skilled and experienced labour. In this regard, agricultural institutions of higher education are expected to play a leading role in training skilled labour that can serve as a catalyst in identifying root causes for low agricultural productivity, devising appropriate remedial measures to surmount problems of food self-sufficiency and improving the traditional farming practices.[1] Yet no major effort has been made to assess the importance of these institutions in expediting the revival of the agricultural sector or to look at factors contributing to their actual performance.

University level agricultural education in Ethiopia began in the early 1950s, 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 June 16, 1951. This agreement became the working plan and legal basis for the country's agricultural education programme.

Prior to this agreement, no institution of higher learning in Ethiopia could impact formal training in agriculture and teach practices which could contribute positively to the growth and development of the agricultural sector. Referring to the situation of trained-personnel in the sector in the early 1950s, Brannon (1966),[2] states:

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[1] Especially, since the mid-1980s the different agricultural institutions of higher learning have placed food-self sufficiency, extension, research work etc., as their primary objectives. A glance through their catalogues attests to this fact.

[2] Dr. Luther H. Brannon was a member of the first group of six Americans, from Oklahoma State University, who arrived in Ethiopia in late August 1952 with a mission to establish and operate agricultural education, research and extension systems in the country. For more information on the historical development of university level agricultural education in the country, see Oklahoma State University (1969).

> By 1952, although education was receiving major governmental support, personnel with training in technical agriculture was practically non-existent. We were unable to locate within the Empire a single national with the equivalent of a Bachelor of Science degree in any phase of agriculture. Not one. Only a very few had technical training to the diploma level.

Therefore, officials of both countries recognised the urgent need for setting up a system of agricultural education in Ethiopia. Consequently, on May 15, 1952, the 'Agreement for a Co-operative Agricultural Education Program 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 and the Imperial Ethiopian College of Agriculture and Mechanical Arts (IECAMA) popularly called 'Alemaya College' (now Alemaya University – AU). On the following day, May 16, 1952, another agreement signed between the Technical Co-operation Administration of the United States Department of State (TCA), now United States Agency for International Development (USAID), and Oklahoma Agricultural and Mechanical College, now Oklahoma State University (OSU), gave to the latter the mandate:

- to establish and operate the College;
- to establish and operate a nation-wide system of agricultural extension;
- to set up agricultural research and experiment stations; and
- to furnish technicians and administrative staff to start the College.

Based on the then Emperor's suggestion and the recommendation of a team from the Oklahoma State University, it was decided to establish the college at Alemaya, 515 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. These are: training of highly skilled workers; promotion of

agricultural research; and dissemination of appropriate technologies. Moreover, an operational agreement, signed on June 24, 1952, between the TCA and the Imperial Ethiopian Government provided for the development and operation of the Jimma Agricultural and Technical School (JATS) at Jimma, South-western Ethiopia. The fundamental objectives of this school were: to train students in modern agricultural practices so that they could attenuate the shortage of mid-level qualified workforce in the country; and to serve as a source of future college students.

The first classes of the JATS started in October 1952, with eighty students who were selected from a total of five hundred applicants. The school administration assigned the successful candidates into the four high school classes on the basis of their preparation, and the nineteen members of the senior class graduated on August 6, 1953. These graduates remained at Jimma and became the first freshman students of the IECAMA (Siegenthaler 1965:4). Thus, the first university level agricultural training programme, with a four-year curriculum leading towards a Bachelor of Science degree in General Agriculture, started in September 1953 at the JATS. The IECAMA opened its doors to its first batch of students in October 1956. The Senior class moved from Addis Ababa to Alemaya for the final semester. At the end of the 1956/57 academic year, eleven students completed their studies and graduated with Bachelor of Science degrees in General Agriculture.

The original curriculum of the College was prepared to produce graduates with B.Sc. degree in General Agriculture. Gradually, however, the quest for adapting the training programmes to the felt needs of the country led to the introduction of new programmes of study. These include:

- Diploma in Home Economics (1967),[3] Science Teachers Training (1978),[4] Continuing Education (1980),[5] the Junior

[3] The home economics programme was started at Alemaya at the beginning of the 1967/68 academic year with eight girl students. The curriculum was developed for

College Program (1984),[6] Environmental Health Sciences (1996), Medical Laboratory Technology (1996), and Public Health Nursing (1996).

- B.Sc. programmes in Animal Sciences (1960), Plant Sciences (1960), Agricultural Engineering (1961), Agricultural Economics (1962), Agricultural Education (1967),[7] Forestry (1987), Agricultural Extension (1994), Biology (1996), Chemistry (1996), Mathematics (1996), Physics (1996), Public Health (1996), English (1998), Geography (1998), and History (1998).

The undergraduate training programmes of the university have been subject to fundamental changes since the second half of the 1990s. More specifically, AU opened the Faculties of Education and Health Sciences in September 1996. On the other hand, following the

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to-year diploma programme designed to prepare teachers in home economics to teach in the Secondary Schools. After few years, the programme was transferred to Awassa College of Agriculture where facilities and experienced staff were available to run the programme.

[4] The Science Teachers' Training programme was established in 1978 in response to the urgent demand for Ethiopian science teachers in the secondary schools. Students were provided with basic and applied knowledge in Biology, Chemistry, and other related fields. The programme was transferred to Bahir Dar Teachers' College in 1984 and was simultaneously replaced by the diploma programme in agriculture. The latter was started in 1977 at the Debre Zeit as Junior Agricultural College.

[5] The Continuing Education programme was started in 1980 and was designed as an evening programme for the residents of Dire Dawa and Harar towns (50 and 40 km from the University, respectively) who were not able to attend the regular college programme in the day time. The programme included Accounting, Management, and Agriculture (phased out). The staff of AU commute to Dire Dawa and Harar to carry out these programmes. It is a no cost programme to the University as the tuition fees cover the direct costs.

[6] For further details, see the programme of Debre Zeit Junior College of Agriculture in part three of this paper.

[7] The B.Sc. programme in Agricultural Education was discontinued in 1977.

Government's decision, the training programme of the Faculty of Forestry was transferred to the Wondo Genet College of Forestry at the end of the 1997/98 academic year. In addition, the undergraduate programmes in Agricultural Economics and in Agricultural Engineering were phased out in July 1999 and in July 2000 respectively.

M.Sc. Programmes of the School of Graduate Studies

The graduate programme in agricultural sciences was initiated in 1979 at the then Alemaya College of Agriculture (ACA) as part of the school of Graduate Studies of the Addis Ababa University (AAU). When the ACA was upgraded to a full fledged university level in 1985, it established its own School of Graduate Studies with main purpose of launching, co-ordinating and administering postgraduate programmes. Presently, the AU is the only higher institution in the country that offers M.Sc. training level in the fields of Agricultural Economics, Agricultural and Food Marketing, Animal Sciences (Animal Production and Animal Breeding), Plant Sciences (Agronomy, Crop Protection, Horticulture and Soil Sciences), Soil and Water Conservation and Post-harvest Technology.[8]

Administration of the College (the University)

The IECAMA was originally conceived as an independent institution administered by a president with the advice and counsel of Trustees.[9] Members of the Board were appointed by the Emperor and the President was appointed by the OSU and his appointment was subject to the approval of the Emperor. With the foundation of the Haile Selassie I University (now Addis Ababa University), in February 1961, the College became one of the charter units of the University and was renamed 'Haile Selassie I University College of Agriculture'.

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[8] For detailed information on the graduate programmes, see for example Belay, 1997.

[9] In practice the College was patronised jointly by the Ministry of Agriculture (Ethiopia) and Oklahoma State University.

The post of the president was abolished on July 1, 1966 and in accordance with university policy, the top administrative position became that of a Dean. This position was assumed by an Ethiopian. With the appointment of the first Ethiopian to the top management position of the college, Ethiopians took over the operation of the college. The contractual agreement with the OSU terminated in 1968 and the College was placed fully on the budget of the Ethiopian government. The College functioned as a chartered member of the AAU till May 27, 1985 when it was upgraded to a University as Alemaya University of Agriculture. Since July 1994, the AU has been governed by a Board. The Board is composed of the Minister of Education, the Vice Minister of Agriculture, the Minister of Water Resources Development, a prominent private entrepreneur, a prominent academician in Agricultural Sciences, the Secretary of the Oromia National Regional State (where the University is located) and the President of the AU. To reflect the diversity of the training programmes offered at Alemaya, following the recommendation of the University Senate, in December 1999 the University Board decided to rename the university Alemaya University.

Graduation

During the last forty-five years Alemaya University has been mustering up efforts to help the country's agricultural development endeavour gather momentum. Since 1957 (year of first graduation) the AU has conferred 302 M.Sc. degrees, 5758 B.Sc. degrees and 2982 diplomas in various fields.[10] Table 1 presents the total number of graduates from the AU by area of specialisation.

Information concerning the occupational distribution of AU graduates is difficult to obtain. However, an examination of the M.Sc. students' institutional affiliation or agency of origin reveals that the

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[10] For more detailed information on the training programmes at the AUA and the associated problems, see Asfaw and Belay (1995) and Berhane (1982).

AU graduates serve in different capacities in various organization. Table 2 shows the distribution of students by agency of origin.

The Table 2 indicates that the AU has contributed in helping the different governmental organizations in Ethiopia build up and improve the number and quality of their professionally competent personnel.

Table 1: Graduation Statistics of the AU by Field of Study, until August 1999

Type of Programme	Diploma	Degree	
		B.Sc.	M.Sc.(*)
I – Regular Programme			
A) Degree			
• Agricultural Economics		1396	50
• Agricultural Engineering		852	-
• Animal Sciences		1039	76
• Plant Sciences		1842	176
• General Agriculture		90	-
• Agricultural Extension		103	-
• Agricultural Education		27	-
• Mid-career Agricultural Education		28	-
• Arid Zone Agriculture			
• Soil and Water Conservation		38	-
• Crop Production		38	-
• Forestry		260	-
Sub-total A		**5713**	**302**
B) Diploma			
• Home Economics	56		
• Biology (Science Teachers Programme)	381		
• Chemistry (Science Teachers Programme)	326		
• Animal Production & Protection Technology	180		
• Crop Production and Protection Technology	250		
• Rural Economics and Social Development	287		
• Environmental Health Sciences	77		
• Medical Laboratory Technology	70		
• Public Health Nursing	69		
Sub-total B	**1696**		

Table 1 contd.

Type of Programme	Diploma	Degree	
		B.Sc.	M.Sc.(*)
II – Continuing Education			
A) Degree			
• Animal Sciences		21	
• Plant Sciences		24	
Sub-total A			**45**
B) Diploma			
• Animal Sciences	123		
• Plant Sciences	117		
• Agricultural Economics	82		
• Accounting	519		
• Management	445		
Sub-total B	**1286**		
Grand Total	**2982**	**5758**	**302**

Source: Alemaya University Records Office.

(*) A joint M.Sc. programme in Forestry, between AU and the Swedish University of Agricultural Sciences, had been run between 1994 and 1998 academic years. Part of the training was conducted in Sweden. It turned out 45 graduates.

Over the years the image of the AU has changed and it is currently considered by many as an institution where students get well-equipped with theoretical training but with little or no practical field work. This view is confirmed by a survey report (AUA 1986). The report states that the AU graduates, leaders of higher institutions of learning, research institutions and those in the various ministries related to agriculture were interviewed and filled in structured questionnaires designed to evaluate the undergraduate training programme. The results of the survey indicate that more than 70 percent of the respondents were of the opinion that the practical training acquired by the AU graduates was inadequate and could not prepare them for the responsibilities they would assume after graduation. The bias against AU began gathering strength in the late seventies when the student population soared. This has led to stretching the existing facilities to the limit and curtailing the number of educational trips, field visits and practical sessions.

Table 2: Distribution of M.Sc. Graduates by Agency of Origin as at 1999

Agency of Origin	M.Sc. Graduates	Percentage
Institutions of Higher Education	124	41.1
Institute of Agricultural Research	68	22.5
Ministry of Coffee & Tea Development	30	9.9
Ministry of Agriculture	41	13.6
Ethiopian Sugar Corporation	15	5.0
Ministry of Planning & Econ. Devt.	11	3.6
Ministry of State Farms Development	4	1.3
Water Resources Development Authority	2	0.7
Science & Technology Commission	3	1.0
Development Bank of Ethiopia	2	0.7
International Livestock Research Institute	1	0.3
Ministry of Labour & Social Affairs	1	0.3
Total	**302**	**100**

Source: Computed using information obtained from Alemaya University of Agriculture Records Office, 1979–1999.

Another problem, frequently mentioned, relates to the duration of study in the graduate programme. The normal duration of study in the graduate programme is two years, but until the 1995/96 academic year, it was possible to extend it up to a maximum of five years. This had often been the case mainly because of the high turnover of experienced staff, the failure of AU staff sent abroad for further training to report back to duty after the completion of their studies, as well as the inadequate teaching facilities which affected course scheduling and the availability of thesis research advisors. The average duration of study for the graduate programmes as a whole is 3.5 years. However, this length of study does not seem to be appreciated by many graduate students who would have preferred to complete their studies in the set two years. In fact, over the last three

years, as a result of the concerted efforts made by students, instructors and the University management, many students were able to complete their studies in less than three years' time.

Organization and Development of Other Institutions of Higher Learning in Agriculture and Related Fields

Modern higher education in Ethiopia began with the founding of the University College of Addis Ababa on March 20, 1950. During the next few years, other institutions of higher learning entrusted with different objectives were established: the College of Agriculture and Mechanical Arts (1953); the College of Engineering in Addis Ababa (1953); the Institute of Building Technology in Addis Ababa (1954); the Public Health College in Gondar (1954); and the Theological College of the Holy Trinity in Addis Ababa (1960).

Until 1961, institutions of higher education were administered by various government agencies and there was very little co-ordination among them.[11] Neither was there uniform policy on admission, promotion and graduation. This was found to be undesirable and fatal to the future development and expansion of higher education in the country. Consequently, in February 1961, the various colleges existing at that time were brought under a centralised administration by the creation of the Haile Selassie I University. Over the following years, the University had grown substantially by opening new faculties and departments as well as strengthening the already existing

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[11] Among the newly established faculties and departments were: the Faculty of Education (1962); the Faculty of Law (1963); the Faculty of Medicine (1965); the School of Pharmacy (1961); the Bahir Dar Teachers' College (1971); and the Department of Library Science (1967).

institutions.[12] Moreover, other autonomous institutions of higher education were established.[13]

In the second half of the 1970s, the number of higher learning institutions continued to grow considerably. Against this background of proliferation of colleges, it became imperative to set up a national agency for higher education. Thus, in January 1977, the Commission for Higher Education (CHE) was established to co-ordinate the administration of colleges throughout the country and facilitate the sharing of experience among them. Other responsibilities of the CHE included: to promote the training of middle- and high-level labour; to encourage research; and to foster the application of science. Moreover, the CHE with a Commissioner as its head was the highest decision-making organ on matters relating to higher education. The CHE functioned as an autonomous government institution till 1987 after which its duties and responsibilities were transferred to the Ministry of Education. Under the Ministry, the Higher Education Main Department was established and charged with the responsibility of co-ordinating higher education in the country.

Institutions of Higher Education in Agriculture and Related Fields

Until the middle of 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 Assistants 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

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[12] For instance, the Ministry of Agriculture oversaw the IECAMA; the Ministry of Education supervised the Colleges of Engineering and Building; and the Ministry of Public Health controlled that of Public Health.

[13] These include: the Institute of Animal Health Assistants (1963); the Bahir Dar Polytechnic Institute (1963); and the Kotebe College of Teachers' Education (1969).

and Agricultural Organization (FAO) of the United Nations. The institute grants a two-year diploma in Animal Health. From the very outset of its establishment, the Institute did its best to encourage the training of other category of para-veterinary personnel, disseminate information through suitable channels and to provide diagnostic services on animal diseases. The institute 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 the training of agricultural technicians. The Ambo Agricultural Institute was established in 1931. It is one of the oldest institution and the first agricultural school in the country to teach agriculture at primary level. The institution closed during the Ethio–Italian war (1936–1941) and it closed again for the second time in 1952. When it re-opened in 1953, it was completely transformed, its curriculum extended, its equipment and staff increased considerably. Until 1966, the Ambo and Jimma Institutes were secondary schools taking in students who had completed grade eight and giving them four years of general education with major emphasis on agriculture. In 1967 these schools became Institutes of Agriculture giving two years of diploma training in general agriculture and were put under the Ministry of Agriculture.[14] The first students under the new scheme completed their training in July 1969. In 1978, these institutes were upgraded to the College of Agriculture level. At present, these Colleges are under the Higher Education Main Department of the Ministry of Education.

With the overthrow of the Imperial regime and the take-over of power by the Provisional Military Administrative Council (PMAC), in 1974, one of the most urgent tasks facing the new government was to promulgate a land reform aimed at invigorating the agricultural sector.

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[14] The contract of the USAID expired in 1965, leaving all the activities of the JATS in the hands of the Ministry of Agriculture.

In fact, the PMAC placed the issue of agricultural development high on its agenda. In line with its objectives of making the country self-sufficient in food production and reducing vulnerability to famine, the PMAC made unprecedented efforts to do away with the chronic shortage of skilled agricultural labour in the country. As part of these efforts, the following Junior Colleges of Agriculture and other agriculture related institutes were set up.

Debre Zeit Junior College of Agriculture (DZJCA)

This College was founded in what was formerly known as the Debre Zeit Agricultural Experiment Station (located at about 50 km east of Addis Ababa), which was established in 1953 to serve as the first experimental station of the IECAMA. The objective of this station was to provide research information for farmers in the central highlands of Ethiopia, the largest farming region in the country and the most important supplier of basic food crops.

During the first few years research at Debre Zeit was carried out by staff members, from different departments, who were also busy with heavy teaching assignments at IECAMA. Research projects in the station included such areas as field crops, horticultural crops, animal nutrition and farm mechanics. The Debre Zeit station later developed as an autonomous agricultural experiment station under the auspices of the Addis Ababa University. In September, 1977, a two-year diploma granting institution was attached to the station and the whole unit was renamed Debre Zeit Junior College of Agriculture and Agricultural Research Centre (DZJCA). The fundamental objective of the DZJCA was to produce middle level agricultural manpower capable of liaising between experts and farmers. While the research wing of the DZJCA was actively involved in attempting to increase food production, improve indigenous cattle breeds and develop appropriate cultural practices and farming systems for central highlands of the country, the academic wing was striving to train a highly competent workforce. In February 1984, the junior college programme of the Debre Zeit centre was discontinued and transferred

temporarily to Alemaya. The programme phased out at the end of the 1987/88 academic year. With the interruption of the junior college programme, Alemaya regained control over the experimental station and the latter was renamed Alemaya University of Agriculture, Debre Zeit Agricultural Research Centre. However, with the reorganization of the country's agricultural research system, in 1997, the Debre Zeit Agricultural Research Centre was placed under the Ethiopian Agricultural Research Organization.

Awassa College of Agriculture

The College was founded in July 1976 in Awassa (275 km south of Addis Ababa). It was formerly under the administration of Addis Ababa University and was reorganised as an independent institution, in 1994, under the administration of the Ministry of Education. The College now runs different programmes in agriculture both at diploma and degree levels. Following the establishment of the Debub University in 2000 the College became one of the constituent parts of the University.

Wondo Genet College of Forestry

The College is located 275 km from Addis Ababa and was opened in early 1978. It offers a two-year diploma programme in forestry and has as its objective the training of forest rangers capable of supervising, administering, and controlling various forest related operations in the country. Moreover, at the end of the 1997/98 academic year the four-year B.Sc. programme in Forestry was transferred from Alemaya University to the Wondo Genet College of Forestry. The College was initially administered by the Ministry of Agriculture and is currently under the Higher Education Main Department of the Ministry of Education. Like Awassa, following the establishment of the Debub University in 2000, Wondo Genet became part of the University.

Faculty of Veterinary Medicine

The Faculty was established in 1979 at Debre Zeit on the site of what used to be known as the Institute of Animal Health Assistants. Its primary objective is the training of high level manpower in the area of animal health and awards a degree of Doctor of Veterinary Medicine (DVM). The Faculty is under Addis Ababa University and is only indirectly supervised by the Higher Education Main Department of the Ministry of Education.

In 1993, another agricultural college, namely the Mekele University College (MUC) was founded in Tigray (783 km north of Addis Ababa). This College trains students in dry land agriculture and is under the Higher Education Main Department of the Ministry of Education till 2000, when it became a part of the Mekele University. Having initially taken over the arid lands programme of AU, the MUC has rapidly expanded to include various agriculture related programmes. With the establishment of Mekele University in 2000, the Mekele University College and the Mekele Business College were incorporated into it.

Graduation

As already noted, there are noticeable differences among the training programmes of institutions of higher education in agriculture and related fields. To date, all these institutes except the AU were able to train 17,463 graduate students. Out of this group, 348 were awarded with DVM degrees, 422 with Bachelor degrees, and 16,693 with diplomas. Table 3 shows the number of diploma and degree graduates from the various colleges by field of study.

Table 3: Graduates from Institutions of Higher Education in Agriculture and Related Fields, until August 1999

Institution / College / Faculty and Department	Programme		
	Continuing Education	Regular Diploma	Regular Degree
I – Ambo College of Agriculture			
• General Agriculture	448	2033	-
• Agricultural Teachers	129	266	-
Sub-total	**577**	**2299**	-
II – Awassa College of Agriculture			
• Agricultural Engineering and Mechanisation	162	917	54
• Animal Production & Range Land Management	138	1026	98
• General Agriculture	210	698	-
• Home Science and Technology	80	548	-
• Plant Production & Dry Land Farming	219	1363	81
• Agricultural Education (Summer) [b]	203	-	-
Sub-total	**1012**	**4543**	**233**
III – Debre Zeit Junior College of Agriculture			
• Animal Production & Protection Tech.	-	189	-
• Crop Production & Protection Tech.	-	403	-
• Horticultural Prod. & Protection Tech.	-	19	-
• Rural Economy & Social Development	-	384	-
• Accounting	26	-	-
• General Agriculture	13	-	-
Sub-total	**39**	**995**	-
IV – Faculty of Veterinary Medicine			
• Animal Health	-	1638	-
• Veterinary Medicine (DVM)	-	-	348
Sub-total	-	**1638**	**348**
V – Jimma College of Agriculture			
• General Agriculture	630	3285	-
• Animal Sciences	-	157	-
• Plant Sciences	-	359	-
Sub-total	**630**	**3801**	-
VI – Wondo Genet College of Forestry			
• General Forestry	-	1052	38
• Forest Management	-	-	44 [c]
Sub-total	-	**1052**	**82**

Table 3 contd.

Institution / College / Faculty and Department	Programme		
	Continuing[a] Education	Regular Diploma	Degree
VII – Mekele University College			
• General Agriculture	45	-	-
• Animal & Range Sciences	-	-	31
• Crop Production	-	-	34
• Soil and Water Conservation	13	-	42
• Law	49	-	-
Sub-total	**107**	**-**	**107**
Total	**2365**	**14328**	**770**

Source: Compiled using information obtained from records offices of the respective colleges (Faculties).

(a) Continuing Education Programmes are designed for adult students who could not join the regular programmes. These programmes are offered after regular working hours on tuition fee-paying basis.

(b) Summer programmes are mainly aimed to enable teachers in various schools of the country to upgrade their qualification and are conducted from July to September when the participants are free from their teaching assignments.

(c) This was a special B.Sc. programme organised and run under the auspices of The Swedish University of Agricultural Sciences between 1986 and 1990.

Graduates of these colleges serve the country as extension agents, development workers, subject matter specialists, teachers, research assistants, etc. Even though complete information about the occupations and types of jobs held by all these graduates is not available, employment records of 91 former diploma graduates who studied in the AU at B.Sc. level in the 1995/96 academic year and 291 other diploma holders who applied to join the AU in the 1996/97 and 1997/98 academic years reveal that most of them were already in agricultural occupations. The records also show that 186 (48.7 percent) of these diploma graduates were working for the Ministry of Agriculture, 64 (16.8 percent) were employed by the Institute of Agricultural Research, 61 (16 percent) of them were employed by other ministries, 21 (5.5 percent) were employees of institutions of higher learning in agriculture, and 12 (3.1 percent) were working for

non-governmental organizations or private enterprises; whereas the remaining 38 (9.9 percent) had not given information about their occupation.

Another point of interest, in this respect, is the increasing number of diploma holders who want to purse their studies at a Bachelor of Science degree level. For instance, a total of 204 diploma holders applied to join the AU degree programmes in the 1996/97 academic year. The corresponding figures for the 1997/98, 1998/99 and 1999/2000 academic years were 127, 180, and 159, respectively.[15] The sad fact is that the University has been unable to meet this increasing demand, mainly due to the shortage of facilities. In fact, only twelve (6 percent of the applicants), seven (5.5 percent of the applicants), eleven (6 percent of the applicants), and eleven (7 percent of the applicants), diploma holders were granted admission for the 1996/97, 1997/98, 1998/99, and 1999/2000 academic years, respectively.

Problems Affecting Higher Level Agricultural Personnel Training in Ethiopia

Problems affecting the performance of institutions of higher learning in agriculture and related fields differ from one institution to another and are very complex and diverse. In what follows only those problems which are not institution specific and which apply to all will be presented.

Shortage of Highly Qualified, Competent and Experienced 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. The present staffing situation of these institutions reveals the fact that most of them suffer from the chronic

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[15] Among those who applied to join the AU in the 1997/98 academic year were 40 applicants who were unsuccessful in securing admission during the 1996/97 academic year.

shortage of highly qualified and experienced staff. Upgrading the academic qualifications of the staff has been placed high on the agenda of these institutions since their establishment. Especially, since the mid-1980s unprecedented efforts have been made to train staff members both at M.Sc. and Ph.D. levels on the firm ground that an investment in human capital would yield long-term multiplier effects and contribute to the economic development of the nation. However, efforts at upgrading and training staff have, in general, not come to fruition because nearly all of the senior staff members sent abroad for their terminal degrees never come back.

Shortage of Supplies/ Equipment and Inadequate Facilities

The availability of basic materials and teaching aids, like photocopy machines, computers, audio-visual aids, vehicles, etc. is very important in facilitating the activities of instructors and harmonising the teaching-learning process. At present, in most institutions, there is either a serious shortage or an absolute lack of supplies and facilities required for adequate teaching.

In spite of the steady increment in the student population of the institutions of higher education, since the second-half of the 1970s, classrooms, dormitories, cafeterias, health services and laboratory facilities have not grown to commensurate degree. 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.

Shortage/ Lack of Library Materials

Up-to-date and specialised literature and references are essential forthe 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 staff keep pace with the 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.

Weak Practical Training Component

The catalogues of the institutions of higher education in agriculture and related fields underline the importance of the practical training component. Available evidence indicates that till the mid-1970s, due emphasis was placed on practical training and graduates of these institutions proved themselves competent and up to the standard. However, with the growing student population, most of these institutions 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, the student 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.

Teaching Programmes with Little Reference to the Ethiopian Conditions

As mentioned earlier, standard textbooks and/or teaching materials relevant to the Ethiopian conditions are lacking for many of the courses in the institutions. 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 organizations. 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 organization 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.

Future Challenges for Institutions of Higher Learning in Agriculture

Successive governments in Ethiopia have placed the training of qualified agricultural manpower high in their agenda on the grounds that such training would provide a powerful impetus to overall development efforts in the country. For a long time now the scarcity of trained personnel in agriculture has been acknowledged as a permanent problem that the country has to live with. At present, the institutions of higher learning in agriculture and related fields in the country graduate on average 600 diploma, 350 B.Sc., 20 DVM, and 15 M.Sc. holders per year. A closer look at the current situation of trained personnel in the country shows that there is still an exorbitant demand for high level agricultural graduates. This is strongly confirmed by a survey carried out in June and July 1997, on the currently available and additionally required agricultural trained

labour in the Amhara, Oromia, Southern Nations and Nationalities, and Tigray regions as well as in the Headquarters of most of the non-governmental organizations in the country.[16] The results of the survey, which is based on interviews of 47 respondents in charge of employing trained personnel from institution of higher learning in agriculture and related fields, are summarised in Table 4.

In spite of what may seem rather controversial results as regards the composition of trained personnel required, the results of the survey, which covered most regions of the country, provide reasonable indicators of the prevailing overall high demand for agricultural experts in the country. As shown in Table 4, in the next five years, the demand for highly skilled workforce in agriculture (excepting diploma holders) is expected to increase substantially. The envisaged reduction in the demand for diploma holders is partly explained by the increased demand for B.Sc. degree holders who are generally more competent and well prepared to handle different responsibilities in their areas of specialisation. With regard to the current agricultural personnel requirement, the survey report indicates that the responding organizations had vacancies for 635 diploma holders, 213 B.Sc. degree holders, 31 M.Sc. graduates and 33 DVM degree holders.

It is a palpable fact that the country's current capacity to train higher level agricultural personnel is below what is required to meet the growing demand for the same. In this regard, the above figures speak for themselves underlining the existence of a widening gap between the supply and demand for trained personnel in the sector in Ethiopia. Any attempt to alleviate the shortage would call for the establishment of additional institutions of higher learning and/or strengthening the already existing ones. In the short run, the opening of new institutions is a daunting task for it requires adequate planning, thorough study and finding the right source to cough up the money

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[16] For a detailed information on the results of the survey, see Basham, Charles *et al.* (1997).

needed to open new institutes. As a result, rationalising the existing training programmes becomes imperative.

Table 4: Currently Available and Additionally Required Agricultural Labour in Ethiopia

Level of Training	Available in 1997	Additionally Envisaged in 2002
Ph.D.	138	322
DVM.	302	50
M.Sc.	989	445
B.Sc.	1746	12362
Diploma	8008	-326
Total	11180	12853

Source: Basham, Charles *et al.* (1997:16).

As already noted, the majority of the institutions of higher learning in agriculture and related fields currently train students at Diploma level. Given the eventual decline in the demand for diploma holders, there is a need for upgrading the current diploma training programmes to degree level, thereby partially alleviating the growing demand for high level agricultural manpower. In line with this, the AU, the Awassa College of Agriculture and the Mekele University College should be encouraged and supported to expand their facilities. With regard to graduate studies, the AU could consider offering non-thesis M.Sc. training designed to meet the needs of non-research professionals in agriculture. Such a programme would have the advantages of being completed within a short period and being less expensive. The possibility of offering specialised post-graduate training at certificate and diploma levels should also be given serious consideration

Although the aforementioned short-term solutions appear to be less challenging, they would necessitate additional investment to improve and/or expand current facilities. Solutions seeking to bridge

the gap between the supply of and demand for trained personnel would require careful planning, detailed studies and adequate preparation prior to implementation.

Another important area of concern is the university students' lack of interest to make a career as agricultural professionals. Before 1992, the Government used to place all university graduates in different public institutions. However, the Transitional Government that replaced the preceding Marxist regime in 1991 immediately embarked on major structural reforms. As one of the first steps in labour market liberalisation, in 1992, the Government ceased to place university graduates who since then have been responsible for seeking employment in the labour market. As a result, students enrolling in institutions of higher learning have been closely following changes in the labour market. This situation had led to rising enrolment in engineering and medical sciences. Other areas of study that university students want to join being natural sciences, social sciences and agriculture, in that order.

Given the fact that the institutions have limited capacity, admission is on a competitive basis. In practice, among all those who qualify for university level studies, the ones with excellent academic records get priority and others follow till the available places are exhausted. This practice has led to placing best students, in faculties or colleges, according to their interest and the remaining ones where extra places are available. This fact can be inferred from Table 5 which shows that the majority of the students who joined AU between 1993 and 1997 academic years, had not selected agriculture as their first, second or third choice.

Apart from the situation in the labour market, it appears that despite the agricultural sector's importance to the national economy, a misconception or derogatory opinion prevails about agriculture as a profession. To overcome this stumbling block, institutions of higher learning in agriculture and related fields should take steps to

popularise their training programmes in the secondary schools and generate sufficient interest in agricultural sciences.[17]

Table 5: Distribution of Freshman Students Placed in Faculty of Agriculture (at AU), in Percentage

Choice Number	1992/93	1993/94	1994/95	1995/96	1996/97
1	33.3	19.6	6.4	3.6	12.8
2	19.8	6.8	8.8	8.5	14.7
3	12.0	9.1	11.0	12.8	15.7
4	6.7	7.5	10.4	11.4	8.8
5	3.6	7.7	9.8	10.9	7.1
6	1.4	5.0	9.8	6.0	6.9
7	1.2	2.5	8.2	4.6	3.5
8	0.0	2.3	4.2	2.2	4.5
9	0.2	2.5	3.6	2.2	2.6
10	0.0	0.9	2.0	2.9	2.6
Greater than 10 (*)	1.0	3.0	5.4	2.2	7.3
Without choice	20.7	33.0	20.1	32.9	13.4
Total	**100**	**100**	**100**	**100**	**100**

Source: Computed using information obtained from the Office of the Registrar, AU.

(*) Up until the 1996/97 academic year students could choose among twelve degree programmes. After this period, the number of programmes was increased to nineteen.

Conclusion

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,

[17] For more information on derogatory opinion about agriculture, see Asfaw and Belay (1995).

one can safely say that institutions of higher education in agriculture have been, in general, contributing positively to the national development efforts because in their absence there wouldn't have been the progress achieved so far.

The current state of affairs in the agricultural sector, however, shows that there is still an acute shortage of high level agricultural labour in the country. Available evidence shows that the existing training capacity needs to be augmented considerably in order to satisfy the ever-increasing demand. In this regard, the government should give immense political weight to the strengthening of the existing institutions and opening of new ones. However, the latter measure should be considered as a long-term one because, in addition to being costly, its immediate implementation could lead to simple duplication of the existing training programmes, aggravation of the already serious staff-shortage problem in the institutions of higher learning and wastage of resources.

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