

The Ethiopian Higher Education Landscape and Natural Resources Education & Research¹

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1. Introduction

It is an honor and privilege to be given this opportunity of addressing distinguished leaders, managers, faculty and students of the Oregon State University. In this short presentation, focus would be made on two interrelated topics: the higher education landscape in Ethiopia and the status and future directions of education and research in the field of natural resources. In a situation where there is abundant but equally deteriorating natural resources affecting the livelihood of millions of Ethiopians, it is important to address the issues of education and research in natural resources management and conservation, as well as their sustainable exploitation. Higher education institutions, both in Ethiopia and the USA need to be vibrant centers of innovation and leaders in national capacity building.

The paper will try to outline possible future collaborations that should be fostered and strengthened between Ethiopian higher education institutions and the Oregon State University. Particular attention is given to the already started collaboration between the College of Forestry of OSU in the USA and Wondo Genet College of Forestry of Debub University in Ethiopia. Strengthening this collaborative undertaking in education and research would help improve the capacity of both institutions, generate new knowledge and assist in adapting relevant knowledge and skills. Furthermore, it will enhance partnership for a better future in changing the livelihood of people and in satisfying our professional expectations.

2. Higher Education in Ethiopia

Higher education is crucial for social progress and economic development. Competent and responsible human resource is critical for political stability and peace, as well as building democratic culture and cohesive societies. Higher education produces the vital human resource, such as teachers, healthcare professionals, agriculturalists, foresters, conservationists, lawyers, engineers, managers,

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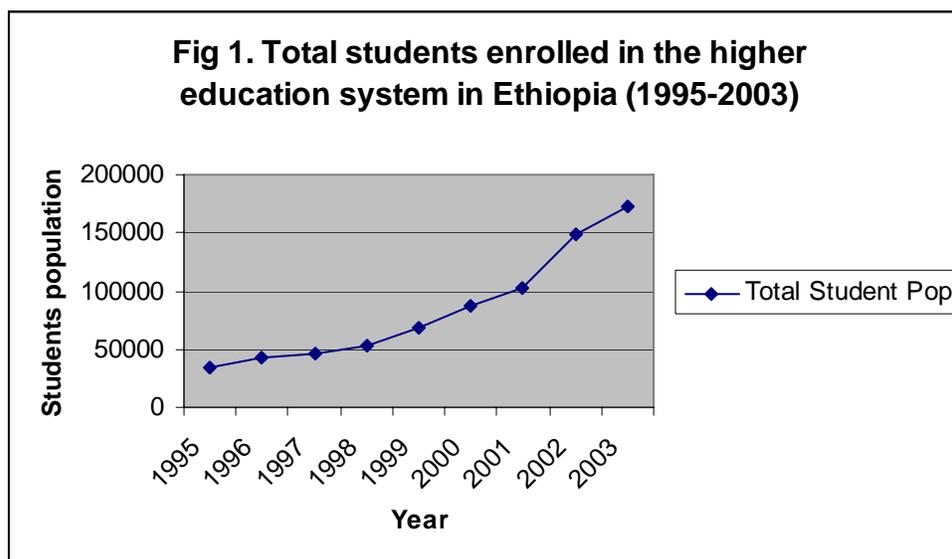
businessmen, and researchers. Furthermore, higher education is a center for knowledge and skills creation, adaptation and dissemination. It also plays a significant role in providing relevant and quality community and public services. The academic and research activities of tertiary education provide important support for national innovation and competitiveness.

Higher education and training in Ethiopia has started over 50 years ago, but still remains highly underdeveloped. For a population of over 70 million, the enrolment in higher education is very low. The system as a whole (private and public) has enrolled a total student population of about 172,111 (table 1), in the 2003/4 academic year. This is a significant increase from the situation in 1995 where the total student population was around 35 thousand (fig 1). The participation of female students is extremely low, although this can be attributed largely to the low participation rates in the other levels of education. Only about 1.5% of the age cohort is currently participating in higher education in Ethiopia. Generally, even by Sub-Saharan African standard, the enrolment figures of Ethiopia are simply dismal.

Table 1. Student enrolment in the Ethiopian higher education system

Year	Both Sexes	Female	% Female
1995/96	35,027	7,282	20.8
1996/97	42,112	8,514	20.2
1997/98	45,554	8,702	19.1
1998/99	52,305	9,769	18.7
1999/00	67,673	16,272	24.1
2000/01	87,431	18,207	20.8
2001/02	101,829	26,894	26.4
2002/03	147,954	37,256	25.2
2003/04	172,111	43,307	25.2

Source: MoE, Education Abstracts

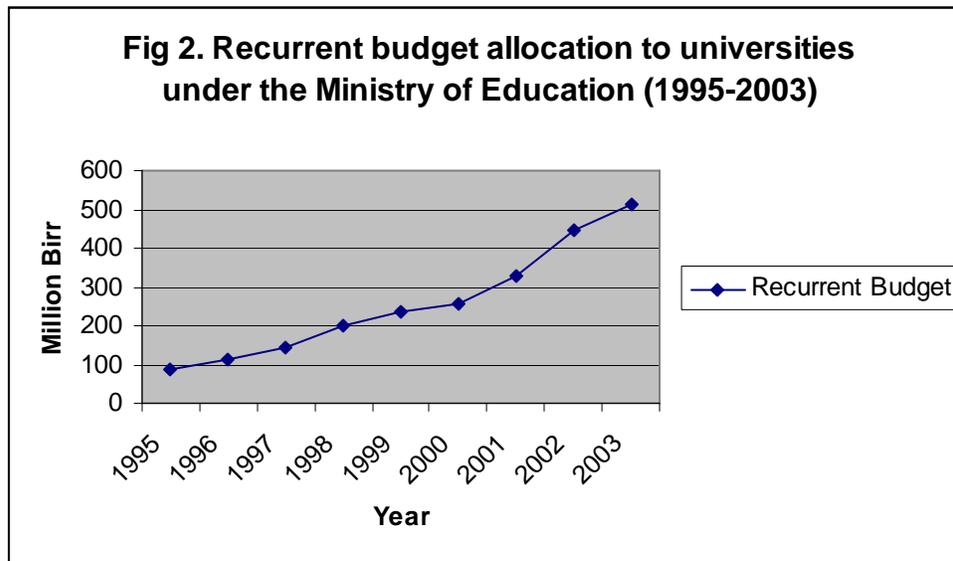


Currently, there are nine higher education institutions under the direct auspices of the Ministry of Education. In addition to these, there are three institutions under different Federal government entities, more than eight teacher-training colleges under Regional Governments and over 64 accredited private higher education institutions. Of the 64 private institutions 56 provide diploma level education and training while 41 provide degree level education and training. In 2003/04 academic year, the private institutions account for about 23% of the overall (degree and diploma levels) enrolment and about 11% of the degree level enrolments of the system.

The Ethiopian economy is constrained by the low participation rates in higher education that have resulted in the shortage of educated and skilled human resource. Although the student population per 100,000 inhabitants has increased from around 65 in 1995 to about 220 in 2003, it still shows critical shortage of experts and professionals in different disciplines. The total number of graduates in 2003/04 was over 39 thousand (29% female)- a significant increase from 1999, which graduated less than 12 thousand students. I believe this is a critical point of concern in national development and poverty alleviation endeavors. It is also a serious problem in relation to attraction of local as well as foreign direct investments that are important and key for quick and sustainable development that requires highly skilled human resource.

Ethiopia spends about 2.8% of its GDP on education; lower than the average for Sub-Saharan Africa that is around 3.9%. The annual budget allocation to the education sector has increased over the past few years, from about 9% (~176 million USD) in 1997 to about 14% (~353 million USD) in 2003. However, this is still low compared to the African average of 20%. The sources of income of a public institution consist of an annual block grant budget allocated by the government, subsidies made by government in cash or kind, income generated from services delivered by the institutions such as research, continuing education and distance education, consultancy and such other activities undertaken by the institution to generate income.

The past few years, there have been significant investments in the higher education sector towards increasing access, improving quality and relevance, and making the universities and colleges more responsive to the needs of the country. Of the total education budget, on average 15-20% is allocated to higher education. In real terms, the recurrent budget has increased from around 10 million USD in 1996 to over 60 million USD in 2004 (fig 2). In addition, the capital budget investment for higher education in Ethiopia has increased from less than ~8 million USD in 1996 to over 90 million USD in 2004.



The research development and publishing capacity and culture of institutions are also severely limited largely due to poor infrastructure, high brain drain and limited resources and inefficiency in the use of available resources. Overall, the challenges that are compounding higher education development in Ethiopia are numerous and complex.

Several policy and strategy provisions and major re-engineering or reform initiatives are being undertaken to address these multiple challenges. The initiatives are mainly efforts to realign the system in order to contribute more directly to the country's strategy for rapid economic growth and poverty alleviation. One of the strategies is the expansion of access by opening new programs and institutions, as well as strengthening the existing ones. The major programs that were expanded relate to teacher education, engineering and technology, health sciences and applied sciences. Strengthening programs of Alemaya, Debub and Mekele universities that focus on agriculture, forestry and natural resources was also given due consideration. However, the higher education system has problems of quality and relevance, management efficiency and leadership and a need for increased access. Particular attention is needed to maintaining quality and ensuring relevance of education and research. Improvement of facilities and infrastructure is also critical.

Without a significant increase in participation/access in higher education as well as all the other levels of education and training, Ethiopia will not be able to develop the broad base of trained human resource and effective institutional capacity needed for sustained economic growth and a place in the global economy. A strategy of catching up with the rest of the global economy needs more than doubling the tertiary education participation rate and establishment of focused research oriented institutions serving the nation as centers of excellence in different areas.

The higher education capacity building program for the period 2005-2010 envisages yet a larger expansion and strengthening of the higher education and research system in Ethiopia. In addition to the strengthening of the existing higher education institutions, additional thirteen undergraduate university colleges will be established. Graduate programs that bring more research activity to the institutions will be opened in most of the universities. These higher education institutions will be the powerhouse for education, training and applied research and development.

The five-year (2005-2010) education sector development program indicates that the higher education system in Ethiopia should be moving away from exclusive enrolments of 1-2% of the age cohort towards increasing participation to over 5%. This is an ambitious plan, but a necessary one if Ethiopia is not to be left further behind in the increasingly knowledge based global society.

The Centers of Excellence will mainly focus on generation and adaptation of knowledge through research and graduate level education. Centers of excellence in the areas of biotechnology and natural resource Sciences are directly relevant to natural resource education and research within the higher education landscape of Ethiopia. Such a comprehensive strategy will respond to Ethiopia's need for food security, healthcare, and technological innovations and sustainable natural resources management and conservation, as well as exploitation for socio-economic development.

3. Natural Resources Education and Research in Ethiopia

With a population of over 72 million in 2004, Ethiopia is the second populous country after Nigeria in Sub-Saharan Africa. It is endowed with diverse natural resources. The country has landscapes that range in altitude from more than 120 m below sea level to over 4600 m above sea level. It has a unique setting and diversity in flora and fauna, as well as people, languages and cultures. Annual temperatures range from a minimum of about zero degree Celsius to a maximum of over 45 degree Celsius. Rainfall also ranges from areas that hardly get rainfall to areas receiving over 2000 mm annual rainfall. It is practically a "laboratory" for any research topic one can imagine. In the area of natural resources, it would be a test case for any professional and researcher to look into diversity, uniqueness and complex challenges.

Natural resources- soil and water, forests, fauna and flora, people and cultures, etc- play a critical role in enabling people to secure a stable and adequate food supply and livelihoods. However, Ethiopia is currently losing its natural resource base at an alarming rate. Currently the unabated deforestation and land degradation impair the capacity of these resources to contribute to food security, provide other benefits and improve the life of the people. The high rate of population growth, as well as lack of

awareness of the sustainable use and protection of resources are continuously resulting in land degradation and worsening of poverty.

Forest cover of Ethiopia, which was estimated at around 40%, a century ago, is now alarmingly around 3%. The erosion of soils and degradation of land areas is serious. Soil loss brings loss of fertility, reducing moisture holding capacities of soils and deterioration of soil behaviors. This situation calls for concerted efforts in the area of education, research and professional support. Relevant and well-articulated collaborative interventions by government and development partners' will have a significant contribution to reduce the alarming degradation of land. Effective local level management and appropriate use of natural resources and conservation is urgently required. Integrated approach addressing issues of forestry, soils, climate, wildlife, sociology, agriculture, etc. are necessary for the success of any intervention that is geared towards ameliorating land resources and reducing degradation.

Targeted interventions and investments in natural resources management and conservation and the promotion of sustainable and equitable use of natural resources may be significant in mitigating disaster and reduce social tensions. Development, poverty alleviation and sustainable management of the environment also depend on the availability of informed policy and decision with relevant research. However, these call for availability of research information and trained professionals in the areas of forestry and natural resource management and conservation.

Currently natural resource professionals are very few in number and are generally in low supply in Ethiopia. The only institution producing forestry professionals is Wondo Genet College of Forestry under the Debub University. The agricultural faculties of Debub, Alemaya, Jima and Mekele universities are producing professionals in fields related to natural resources (table 2). However, the number of graduates produced by these institutions does not meet the high demand for skilled professionals. Furthermore, there are serious gaps and mis-match between the education provided and the real world situation. Most of the education curricula are theoretical, not informed by research, often times lack relevance and have very poor in linkages with the community.

Table 2. Agriculture and natural resources related programs in higher education institutions in Ethiopia

<i>Institution</i>	<i>Program</i>	<i>Enrolled Students (2003/04)</i>
Alemaya University	a) Undergraduate Degree Programs	
	▪ Animal Science	248
	▪ Extension	311
	▪ Plant Science	337
	▪ Agriculture Teachers	195
	▪ Soil & Water Conservation	231

	b) Graduate Degree Programs <ul style="list-style-type: none"> ▪ Agricultural Economics ▪ Animal Sciences ▪ Plant Sciences ▪ Soil & Water Conservation 	49 44 76 16
Mekele University	a) Undergraduate Degree Programs <ul style="list-style-type: none"> ▪ Animal, Range and Wildlife Science ▪ Land Resource Management & Environment Protection ▪ Natural Resource Economics & Management ▪ Dry-land Crop Science b) Graduate Degree Programs <ul style="list-style-type: none"> ▪ Land Resource Management & Environment Protection 	241 322 146 280 15
Debub University	a) Undergraduate Degree Programs <ul style="list-style-type: none"> ▪ Animal and Range Management ▪ Plant Production & Dry-land Farming ▪ Rural Development & Family Science ▪ Agricultural Resource Economics & Management ▪ Production Forestry ▪ Farm Forestry ▪ Natural Resource Management ▪ Forestry (Previously started) b) Graduate Degree Programs <ul style="list-style-type: none"> ▪ Forestry ▪ Plant Sciences (New Proposals at Wondo Genet) <ul style="list-style-type: none"> ▪ Agroforestry and soil fertility management (new) ▪ Watershed management (new) ▪ Wildlife resources management and ecotourism (new) ▪ Natural resources economics and policy (new) 	231 237 180 117 98 122 133 121
Jima University	a) Undergraduate Degree Programs <ul style="list-style-type: none"> ▪ Crop Production ▪ Anima Production ▪ Natural Resource Management ▪ Horticulture 	128 129 80 287
Addis Ababa University	a) Undergraduate Degree Programs <ul style="list-style-type: none"> ▪ Biology ▪ Geography b) Graduate Degree Programs <ul style="list-style-type: none"> ▪ Regional & Local Development Studies ▪ Biology 	293 277 103 190

Education and research in natural resources will have a significant impact in altering the tragic degradation of natural resources in the country. Launching of undergraduate and graduate level education in the field of natural resources is necessary, and need expansion in many of the universities. Currently Debub, Mekele and Jima universities provide education in the fields of natural resources. However, it is practically only Wondo Genet College of Forestry that provided natural resources education integrated with forestry education and research. Although the graduate programs of Mekele university on Land Resource Management and Environment Protection, of Alemaya university on Plant

Sciences and Engineering and of the Debu university on Plant Sciences are possibly addressing issues of natural resources management and conservation, the newly proposed graduate programs of Wondo Genet are unique in covering the full aspect of natural resources issues integrated with forestry education and research.

The Wondo Genet College of Forestry is in the final stages of opening graduate level (MSc) training in the areas of (1) Soil resources and watershed management (2) Nature conservation and eco-tourism, (3) Natural resources economics and policy, and (4) Wildlife and fisheries management. It is also pioneering in integrating the education programs with a development oriented inter-disciplinary thematic action research. This is also supported with the general agreement of higher education institutions in Ethiopia to make their curricula Community Oriented and Practical. Oregon State University (OSU) is an active participant and collaborator in the designing of the curricula, sharing of international experiences and transfer of skills and technology.

Along with education in the field of natural resources, it is equally important to undertake development-oriented research that will address real-life issues, and have a contribution to improving the livelihood of the population, promote sustainable exploitation, management and conservation of natural resources and enhancing overall socio-economic development of the country. Such research undertakings will also improve the education and training given in universities making curricula more relevant and integrated with the real world situations. Most universities are not actively engaged in development oriented research and extension activities. Furthermore, the institutions are not involved in relevant applied research to play their catalytic and leading role in identifying development problems and devising appropriate measures. Like the education and training curricula, the research undertakings have very poor link to local communities. This is a critical issue that needs to be addressed in the transformation of the higher education system and development of partnership for the transformation. It is also essential to have effective mechanisms of disseminating research results and informing policy and implementation at all levels.

As the degradation of land is increasingly threatening the livelihood of people, escaping this trap will require great ingenuity and cooperation. As discussed earlier, the development of curricula for undergraduate and graduate programs at Wondo Genet College of Forestry and some capacity building of the faculty, was supported by the College of Forestry, Oregon State University. The collaboration that has started between Oregon State University and Wondo Genet College of Forestry of Debu University in Ethiopia, in this respect, would bring a significant opportunity mainly to the benefit of the peoples of Ethiopia. The current collaboration, which is expected to expand, focuses on strengthening Wondo Genet college of forestry capacity in natural resources education and research, as well as revitalizing the

research focus and directions. Furthermore, it strives to strengthening the Ethiopian Agricultural Research Organization (EARO) research capacity by providing training for the forestry and natural resources professionals, as well as undertaking joint collaborative research. Collaborative needs assessment for future collaborative works and interventions are to be undertaken to expand the collaboration to benefit of education and research in natural resources.

4. Future Directions/Expectations

The centerpiece of the development strategy in Ethiopia is focusing on poverty alleviation, and need to make overall capacity building and sustainable use of natural resources as the critical issue for success. Of the many important economic and social growth initiatives of the government of Ethiopia, perhaps one that holds great promise and possibility of large scale and sustainable returns, despite many daunting difficulties, is the effective expansion of quality higher education in the country. The impact of higher education encompasses not only the economic sector, but also will produce greater social impact contributing to a just, democratic, peaceful and enlightened society. Major interventions to build local capacity of producing professionals and undertaking applied research in the area of natural resources management and conservation are extremely important. The focus given to strengthen research capacity in the fields of agriculture, forestry and natural resources under the umbrella of Ethiopian Agricultural Research organization (EARO) is also significant. However, in both the education and research programs, there is a serious limitation of capacity. These limitations relate to lack of the required quality and number of professionals and institutional capacity in terms of infrastructure and facilities.

Unsustainable exploitation of natural resources and degradation of land is threatening the livelihood of millions of people in Ethiopia. Resource degradation and disaster largely affect the livelihoods and lives of the poor in rural Ethiopia. Loss of livelihoods leads to social tensions, migration and settlements in inappropriate areas. Resolution of this challenge will be the key to sustainability. The situation, therefore, calls for immediate action in policy and intervention through deploying large number of qualified professionals and undertaking relevant applied research.

The expansion in the higher education sector and the increasing focused articulation of the research agendas and strategies in Ethiopia is an opportunity to address these challenges. The plan to establish centers of excellence is an additional favorable landscape to push furthers the education and research issues in natural resource. For instance, two of the centers of excellence could possibly be housed in the existing institutions, such as Wondo Genet College of Forestry. This will further facilitate

strengthening of collaborative research and education undertakings with partner institutions abroad, such as Oregon State University.

The current and future higher education landscape that is based on expansion of programs in Ethiopia is an opportunity to realize these endeavors. The human resource in the universities and research establishments is positive and ready to see transformation. The Ethiopian Diaspora, friends of Ethiopia and development partners are also mobilizing expertise and resources to alleviate poverty and bring about sustainable development in the country. Public-private partnerships are also developing, with shared goals of improving the livelihood of the population. Therefore, the ground is fertile for international collaboration in promoting human resource development, research and experience sharing in the areas of natural resources and many other disciplines. International institutions involved in natural resources education and research could contribute to development of curricula, upgrade ICT and systems, improving faculty skills, develop faculty, engage in teaching and research activities of institutions in the south and generate knowledge. The networking created through such collaborative undertakings would be immense and valuable.

A planned capacity building and intervention is needed to improve the challenges of higher education management and leadership, quality and relevance assurance and enhancement, faculty development, research design, undertaking and dissemination, facilities and infrastructure improvement, and informed decision making and networking. Partnerships and collaborations in multi- and interdisciplinary research is essential to feed back to curricula, develop skills of faculty and contribute to policy and strategy dialogues and decision making. Such undertakings and partnerships undoubtedly will help foster internationalization of education and research programs.

On May 15, 1952 an agreement was signed between the Imperial Ethiopian Government and the Government of the USA for a Cooperative Agricultural Education Program. This agreement laid down the foundation for the establishment of College of Agriculture at Alemaya and Jima in Ethiopia. Oklahoma University was given the mandate from the US government to establish and operate Alemaya College. The model adopted was a land grant system to train highly skilled workers, promotion of agricultural research and dissemination of appropriate technologies. Is there any possibility that Oregon State University venturing on such an undertaking in Ethiopia today? I believe the opportunity and the good will is there. The already started collaborative work and partnership has laid down the ground for a focused and committed action now. It only needs a concerted effort from both sides and mobilization of our collective wisdom and resources.

As suggested earlier, Wondo Genet college of Forestry is in an ideal position to become a center of excellence in Ethiopia. This center of excellence has also the opportunity to serve Eastern and Southern

Africa, as well as the World in the fields of natural resources sciences and biotechnology, as well as research in medicinal plants and eco-tourism. There is a keen interest and dedication from the Ethiopian side as well as the Oregon State University College of Forestry. The interest from the Ethiopian side even extends to the level at which a US university take over the leadership and management of a selected higher education institution in Ethiopia to bring about modern management and raise the institution to a standard renowned university undertaking high level research and education. Such arrangements are perceived to make higher education institutions to be leaders in knowledge creation, adaptation, adoption and dissemination for better policy and strategy formulation and implementation.

The Oklahoma model is highly welcome and encouraged in Ethiopia. There is a great potential and opportunity to employ such approaches for a better, quicker and effective capacity building. Ethiopia is a land of diverse, unexplored, sometimes unparalleled home of natural resources-flora and fauna, culture and languages, archeology and history, etc. It is therefore, a living and natural all-rounded laboratory for any research topic- from deserts to temperate climates, from sea level to ranges of high mountains rising above 4000 m asl, from barren land to tropical rainforests, from ancient and traditional agricultural settlements to pastoral land husbandries, etc. etc.

There is a lot that we could do in collaboration. We have already started very interesting and beneficial collaborative undertakings. I hope we could see a strengthened and enlarged such exemplary development oriented and mutually benefiting and satisfying collaboration and undertakings between Oregon State University and Wondo Genet College of Forestry.