AFRICAN RESEARCH UNIVERSITIES ALLIANCE (ARUA)

Towards developing a Collaborative PhD Program across ARUA Member Universities

Experiences from Addis Ababa University, Ethiopia

A Research Report Produced for ARUA by the Human Sciences Research Council (HSRC)

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November 2022

Table of Contents

List of Tables

Chapter One – Introduction and background

1.1   Introduction to the study and report

This report highlights the status of PhD education in Ethiopia, using the Addis Ababa University as a case study. The report provides an overview of the country's socio-economic status which has a bearing on how universities organise PhD programmes and which may influence the direction of the design of collaborative programmes as envisaged by ARUA. The report details the national and institutional policy and operational frameworks for PhD programmes at the Addis Ababa University, nature of student access and progression policies across the programmes, opportunities for designing collaborative arrangements and challenges that need to be addressed. The report is divided into five sections. The foreword is the first section. The proceeding section provides an overview of Ethiopia's socio-economic and political dynamics including a brief description of the Ethiopian higher education landscape. Section three delves into the case study university and the two selected programmes. The penultimate, section four presents findings from the collected data from the two case study programmes. The ultimate, section five provides some recommendations and conclusions.

1.2   Socio-economic and political of Ethiopia

The Federal Democratic Republic of Ethiopia (FDRE) is in the Horn of Africa, neighbouring Djibouti, Eritrea, Kenya, Somalia, South Sudan, and Sudan. It has nine regional states, delineated by ethnicity and two chartered cities – Addis Ababa and Dire Dawa – with their own administrative units. Ethiopia is the only country in Africa that was never colonized despite a brief period of military occupation by Italy from 1936 to 1941. Moreover, Ethiopia is the second most populous country in the continent, next to Nigeria with an estimated population 104, 957,000 (Population Reference Bureau, 2019).

The Ethiopian education system has been influenced by religious education, especially by the Orthodox Church (Wagaw, 1990). The Ethiopian higher education system evolved from Indigenous education systems. Ethiopia has the fastest growing economy in Africa   with gross domestic product (GDP) growth rates of averaging 10 percent over the past decade. Between 2004 and 2017, GDP per capita grew more than fivefold, from USD$136 to USD 768$ while the number of Ethiopians living on less than USD$1.25 a day dropped to 31 percent as of 2011 (World Bank, 2014).

Table 1: The Socio-economic Statistics of Ethiopia

S/N	Socio-Economic Indicators	Statistics
1	National Population	119,616,824 (2022)
2	GDP Per Capita	US$ 826.95 in 2020
3	Human Development Index	0.49 in 2019
4	Unemployment Rate	25.3 percent in 2018
5	Main Economic Sector/s	Agriculture (35.45%) and Services (36.81%) of GDP in 2020
6	Gross Pre-primary Education Ratio	40.7(2018)
7	Gross Primary Enrolment Ratio	30.4 % in 2015
8	Gross Secondary Enrolment Ratio	34.9 % in 2015
9	Gross Tertiary Enrolment Ratio	8.11 percent in 2014
10	Number of Public Universities	Forty-five public in 2021
11	Number of Private Universities	214 accredited in 2021
12	Total spending on HE as percentage of GDP	2.3 in 2020
13	Education spending as percentage of GDP	5.1 % in 2018

Source:

It should be acknowledged that Ethiopia spends more than 1% of its GDP on higher education, a target which most African countries have failed to realize. However, the higher education system might not be allocating sufficient funding towards more doctoral training and knowledge production.

1.3   Historical Political Landscape

During the *Mengistu's,* regime Ethiopia suffered from political violence and radical politics, resulting in armed conflict, famines, and humanitarian crises. In May 1991, the Tigran People Liberation Front (TPLF) which had been led by *Meles Zenawi* succeeded in taking control of Ethiopia, the capital of the country, ousting *Mengistu's* Derg government (Gebru, 2002). The TPLF formed and headed a coalition of political opposition groups called the front of the Federal Democratic Republic of Ethiopia (FDRE). In other words, the TPLF gained support of the Ethiopian people by including within the FDRE various groups claiming to represent different regions and ethnicities. Therefore, FDRE established a federal administrative structure based on ethnic and linguistic distinctions, otherwise called Ethnic Federalism. Ethiopia had been politically stable and economically dynamic over the previous two decades during the reign of TPLF led FDRE (Gebru, 2002)

FDRE, however, had been rocked by mounting unrest and anti-government protests since late 2015. Finally, in April 2018 instated *Abiy Ahmed Ali*, as Prime Minster. *Abiy* demolished the coalition party and formed the new party called Prosperity Party (PP) which is now governing

the country. The political philosophy of PP is *Medemer*, aiming at fostering a sense of national unity in the face of the ethnic differences and divisions. However, the country is still rocked by conflicting and political instability and grew to a conventional war with the former leaders of the TPLF/FDRE who are currently designated as the terrorist group by the Ethiopian Parliament.

The current political unresent and war is due to the legacies of the previous government which have been using ethnic boundaries as administrative boundaries. Although it remains to be seen how the country could emerge from this war which has attracted an international attention, there is fear that Ethiopia could be led by authoritarian government with limited political and press freedom. Moreover, the country is situated in a region of the world – the Horn of Africa – which is politically highly volatile (Assefa and Zeray, 2017).

1.4   Main Economic Activities

During the reign of the Ethiopian People Revolutionary Democratic Front (EPDRF) the country had used a free market economy, albeit a high degree of government intervention which is a socialist element. This model is successful as money observers are calling Ethiopia an "African Tiger Economy" (Notezie Goepleteche, 2016). The GDP per capital has risen to USD826.95 as of 2020, as indicated in the previous Table. Although Ethiopia is endowed with natural resources such as copper, petroleum, gold, natural gas, platinum, potash, and hydropower, the economy of the country is mostly dependent on agriculture with 68 percent of the population employed or working in the agriculture sector. Hence, agricultural commodities are dominating the country's exports, the largest being Coffee, Oil seeds, hides and skin, and gold. Most of which are not value-adding.

The country has been embarking on large-scale infrastructure projects. The construction of $5bn project of the hydroelectric power Dam, the largest in Africa, is near to completion. It is hoped that Ethiopia could become Africa's powerhouse for labour-intensive manufacturing, attracting foreign investors with lower labour costs than in countries like Vietnam or Bangladesh. There is also an electric railway line that links Ethiopia's capital, Addis Ababa, to the Red Sea port of Djibouti – a stretch of more than 750km (466 miles). Moreover, in 2015 the Ethiopian capital, Addis Ababa, opened a new urban light rail system for service—the only such system in sub-Saharan Africa outside of South Africa. Ethiopia has launched a domestic-made satellite into space. The country is however, still one of the least developed countries

(LDCs), ranked 173rd among 189 countries on the United Nations' Human Development index (UNDP, 2019).

1.5   The General Education Systems

The Ethiopian education system is divided into the following sub systems: primary education; secondary education; and tertiary education. The general education structure of Ethiopia is 4+4+2+2. Therefore, the system consists of eight years of elementary education, having two cycles of four year each (Lower Primary and Upper Primary); four years of secondary education, divided into two cycles of 2 years each – Lower and upper-secondary cycles. Furthermore, it consists of a 3 year of pre-primary education, which is run by private providers. There is also alternative educational path, for instance, Alternative Basic Education (ABE). It is designed to educate out-of-school and underserved children by providing them the opportunity to study the first-stage elementary school flexibly, adjusting to the culture and the livelihood of the communities (HESC, 2021).

The Technical Vocational Education and Training (TVET) sector has been overseen by a dedicated federal TVET agency which develops model curricula and sets overall training standards. However, there has been some leeway to customize the curricula to accommodate local industry needs. Strengthening vocational training is a top priority as the country seeks to expand its manufacturing sector and advance the employability of Ethiopian youth. Although the sector has expanded rapidly, it is still insufficient to accommodate the surging demand (HESC, 2021).

Chapter Two – The Higher Education System

2.1   Overview of the HE system

The Education Policy and the Higher Education Proclamation 1152/2019 regulate the expanding higher education system in order to produce high-quality and skilled manpower in line with transforming the country into a lower middle income country by 2025 (Bishaw & Melesse, 2017). In Ethiopia there has not been a stand-alone policy at national and instructional levels for collaboration and internationalization in higher education. Internationalization of higher education is understood in a simplistic way of the presence of foreign students and academics in the higher education sector.

The Ethiopian Education and Training Authority (ETA) and the Higher Education Strategy Centre (HESC) were established by Higher Education Proclamation (HEP) in 2003. This proclamation was modified in 2009 and 2019 and the later version is currently in effect. The ETA and the HESC are answerable to Federal MoE. While ETA is responsible for accreditation, reaccreditation, and program and institutional quality audits of HEIs, ESC oversees vision formulation and strategy development for the Ethiopian public HEIs. While ETA accredits private HEIs, it is only conducting an institutional and program audits for public institutions.

The Federal MoE in Addis Ababa oversees the leadership of public HEIs. The Higher Education Proclamation 1152/2019 stipulates that while boards are the highest governing body in public HEIs, the Senate is the highest academic body. The university Presidents are appointed by the Minister based on the board's nomination (Melu, 2016). The presidents and Boards are appointed based on political alliances, directly negatively impacting academic freedoms and institutional autonomy. The Presidents are assisted by Vice Presidents in the academic running of the HEIs. Private HEIs are led by Presidents, assisted by Executive Vice Presidents, but are immune from governmental appointments. However, the MoE monitors their governance through ETA.

The admission of undergraduate students is based on the Ethiopian University Entrance Exam (EUEE). It is highly selective, given the scarcity of university seats. The best students (with highest scores) will go to public institutions (Trines, 2018) and privates absorb mostly less-qualified students who failed to be admitted to the public HEIs. Several private HEIs are

substandard, profit-driven institutions with poor facilities, unqualified teaching staff (Wondwosen, 2018). Over the past years, there has been a government policy admission of 70:30 which favours science and technology programs over humanities and social sciences. Therefore, 70 percent of students have been admitted to engineering and natural science programs and 30 percent to the humanities and social science (MOE, 2008). Most students were studying STEM without their interest. It has been observed that most undergraduate and post graduate students of STEM in Ethiopia failed to be employed or create jobs (reference). However, there has not been a study considering comparably the labour market absorption of PhD graduates from the Social Sciences & Humanities as well as STEM disciplines.

2.2   Size and Shape of the higher education system

The Ethiopian higher education sector currently comprises fifty-one public universities and about 350 private higher education institutions, with more than one million students. Currently, Ethiopian institutions graduate about 160,000 candidates annually. More than 77% of undergraduates were enrolled in state-run universities, while private HEIs account 17 % of the student intake. Furthermore, there are other universities, for instance, National Defence University and the Police University College which are respectively under the Ministry of National Defence and Federal Policy. There are also regional universities and colleges of teacher training and other college operating under different Office of the regions.

In the public universities, there were 729,028 students in undergraduate programmes: 37,152 in the master's programs and 3,994 in doctoral programs in 2017/18. Despite the overall growth of postgraduate enrolment in Ethiopia, the share of PhD-level studies is limited. In general, this is could be attributed to the fact that PhD education in Ethiopia has been facing a myriad of challenges such as funding, research infrastructure, poor facilities and shortage of resources – laboratories, libraries, learning materials, shortage of ICT materials, lack of support services, insufficient space in the libraries, lack of office or working space for PhD students, poor supervision, and lack of special provisions for learners with disabilities (Nega & Kassaye, 2018).

Hence, most Ethiopian students (about 95 percent) are enrolled in undergraduate programs. The country's higher education system is still considered elitist as the current gross enrolment ratio stands at a little over 13.4%. Creating a more equitable system has been one of the major concerns for Ethiopian higher education sectors. Gender wise, the female student population

now stands at 37.5% at the undergraduate and at 23.1% at the postgraduate levels (Bishaw & Melesse, 2017).

In the Ethiopian higher education sector, there have been foreign distance educations providers like UNISA (the University of South Africa) and India's Indira Gandhi National Open University, and others offering programs. They operate either independently or in collaboration with Ethiopian providers. There is no stand-alone Ethiopian University which operates in an Open and Distance learning modality. The Ethiopian higher education spaces comprise of institutions which vary significantly in type, size, and scope. The Ethiopian HEIs system is differentiated into research Universities, Comprehensive Universities and Applied Science Universities (Education Roadmap Study, 2018). This is believed to enhance quality, effectiveness, and efficiency of the system and to contribute to economic growth and development of the country – to become a lower middle-income country by 2032(AfDB, 2015).

The expansion of the country's higher education system has led to the expansion of postgraduate enrolments. PhD training in Ethiopia has shown a significant improvement over the past decade. From a low of thirty-one doctoral students in 2006/07, the national annual intake reached more than 5,000 candidates in 2020. However, as shown in Table 2 below the enrolments remain gender skewed. In addition to local programmes, scholarships and paid programmes abroad continue to produce additional PhD graduates. However, achievements have always lagged the growing needs for highly trained human resources. For instance, in the past two years, 2020 and 2021 only 534 and 567 PhD graduations were recorded in the respective years. This is a challenge considering the recommended academic staff qualification mix of 0:70:30 to be achieved by the Ethiopian HEIs institutions (Bachelor – Master – PhD). Only 27:58:15 ratios have been achieved in 2011 (Kebede et al. 2011).

The Ethiopian government has been using various strategies to increase access to PhD studies. PhD education has been strengthened through expansion of in-house capacity for the training of local PhDs and in partnership with foreign partners (joint PhD programs) (Nega & Kassaye, 2018). The initiative of Home-grown Collaborative PhD Programmes (HCPP) is due to the government's discontent with the limited expansion of PhD programmes and a reaction to an emerging need for high-level skills driven by the demands of the country's new economic policy. The following Table presents the rate of PhD production from 2018 – 2020.

Table 2: PhD graduation rates by gender and year

Academic year	Sex	PhD Graduates
2018	Male	218
	Female	19
	Total	**267**
2019	Male	478
	Female	56
	Total	**534**
2020	Male	512
	Female	54
	Total	**567**

Source: Higher Education Strategy Center (HESC, 2021)

Financial oversight of MoE is limited to public HEIs. Private HEIs relies heavily on tuition fees as sources of funding. Public universities are directly funded by the federal government. The share of public HEIs annual budget against the country's total annual budget in 2018 E.C., 2019 E.C. and 2020 E.C. was 18.49%, 17.1% and 15.9% respectively (HESC, 2021) When we see the share of public universities budget against the country's GDP, it is 2.62%, 2.37% and 2.19% in the past three consecutive years (HESC, 2021). This clearly shows the fact that there has been a declining trend in the financing of public HEIs. One of the reforms of financing of public higher education was the introduction of cost sharing since 2003. Students cover 15% of their tuition fees, while the government pays the rest. The system is planning to implement a performance-based funding formula based on block grants to the public HEIs.

2.3   Accreditation and Quality Assurance

To address quality problems in the mushrooming private sector, Ethiopia created an accreditation body in 2003 – the then Higher Education Relevance and Quality Agency (HERQA) now Education and Training Authority (ETA). Private HEIs are not allowed to operate in Ethiopia unless they obtain an ETA accreditation certificate for their programs by assessing management structures, infrastructure, learning resources, curricula, academic assessment methods, promotion and graduation rates, research output, and other criteria. Accreditation could be given for a specific set of programs, for which the Authority may stipulate enrolment quotas and permissible modes of delivery of education – regular, evening or distance. HEIs must apply for re-accreditation after three years, after which accreditation is given for five-year periods. Public HEIs are exempted from accreditation. However, they are required to have internal quality assurance systems and regular internal quality audit reports. As such, ETA monitors compliance with these requirements, although it does not take any

measure on those institutions which violate the modus operandi. The Authority then is a toothless lion when it comes to public HEIs.

2.4   Challenges of the System

One of the major challenges facing the higher education system is the politically driven nature of government reforms and policies which are not always informed by research and evidence, for instance, the integration of the Ministry of Science and Higher Education (MoSHE) to become part of the ministry of Education (Adamu, 2021). The increasing regionalisation of universities "reflected through increasing loyalty to regional authorities and engaging in and facilitating ethnic-based faculty transfer is also a serious challenge (Adamu, 2021, P.1). From a collaboration perspective across ARUA universities and the continent broadly this increasing regionalisation could deter the drive towards more collaboration. Greater faculty diversity of not only staff but also students and doctoral students has been compromised in the quest of achieving ethnic agenda across the system and within the institutions.

In the Higher Education sector, educational quality is strained by scarce funding, poor facilities and infrastructure, overcrowded classrooms, insufficient levels of academic preparedness of students, and a shortage of qualified teaching staff. These have been affecting the quality of education and hence the competency of both under and postgraduates. Although ETA which is supposed to improve the quality   of graduates has been criticized for not being autonomous enough and vulnerable to political intervention, having inadequate staffing and infrastructure, as well as low quality thresholds, and non-transparent and sometimes erratic decision-making processes when it comes to the private HEIs. The problem of the higher education sectors could be considered the rippled effects of ETA.

Many students were taught by young, inexperienced instructors holding just a Master's degree. Only 15 percent of university instructors had doctoral degrees in 2015. Although there has been a policy which stipulates the qualification mix of academics in a university to be 0:70:30 (BA/MSc; MA/ MSc; PhD), there has not been a university which achieved this ratio except AAU. In Ethiopian HEIs, research funding and outputs are very low. There has been high and growing unemployment among Ethiopian university graduates. The rate of unemployment for the youth was 25.3% and the share of female and male youth unemployment rates were 30.9% and 19%, respectively (ECSA, 2018).

The phenomenon of graduate unemployment has been a key cause of concern. It has been explained in relation to the lack of relevance and quality of education and mismatch between the education and training by the universities and the demand of the labour market. In a comparative perspective there are great disparities in quality between public and private higher education providers, as the former are much better than the latter. The more than 70% of Ethiopian higher education students come from families in the top income quartile and from urban areas. The challenges of creating an equitable higher education system exacerbates further when it comes to rural-urban; male-female; and special needs students' enrolment gaps.

At the PhD training level, the data in Table 2 presents a much-skewed picture of doctoral graduation rates across gender. With less than 10% of PhD graduates over the three- year period being female, this suggests a lack of gender equality in the support for access into and through the PhD programmes in the system. There is clearly a need for more policies to support and enhance gender parity in PhD enrolments and graduation rates.

In summary, the Ethiopian higher education landscape, to date, has been characterized by regimented management, conservative intellectual orientation, limited autonomy, a low percentage of academic staff with doctorates, declining educational quality, weak research output, and loose connection with the global higher education current (Bishaw, 2006)

Chapter Three – Objectives, Method, and Samples

3.1. Recap of research objective

The overarching objective of this research report is to respond to ARUA's objective to create globally PhD programs among ARUA member universities that are more collaborative in nature. More specifically the research seeks to identify selected PhD programmes at ARUA member universities, review the programmes and make recommendations to ARUA towards better collaboration across the Alliance.

3.2   Methodology employed

Two PhD programmes were selected from each university; one from the humanities and one from the natural sciences. Data was collected from each of the programme coordinators or head of programmes. Institutional data was further collected from the institutional websites, and these were analyzed according to three main themes: access to the programmes, structure of the programme and experience through the programme. Although interviews were conducted with each university vice chancellor/President to get inputs into four fundamental issues related to collaboration: national and institutional policy, current collaboration practice, challenges facing collaboration and recommendations for better collaboration, they (interviews) were not done at Addis Ababa University.

As the only member of ARUA from Ethiopia, AAU was included as the sample institution to be studied in the project. In Ethiopia, modern higher education began in the mid-twentieth century. In 1950, Emperor Haile Selassie established a University College of Addis Ababa [now Addis Ababa University (AAU)]. AAU is the oldest and the Flagship University and it is the pioneer university in Ethiopia in terms of its time of establishment, range and quality of educational courses offered, both in undergraduate and post graduate programs. As such, AAU has been serving as the leading centre in teaching-learning, research, and community services in Ethiopia. In the differentiation policy document, AAU is designed as one of the research universities of Ethiopia. AAU had enrolled only 120 international students in 2016 which is small in small relation to its age and profile (Handbook for International Students, 2017).

The focus PhD programs from the university were selected through a negotiated approach between the research team and the participating university. While a set of criteria were proposed, the university had the discretion to suggest a preferred programme from the humanities and another from the natural science. The PhD programme in Economics, from Social Sciences and Humanities and the PhD program in Plant Ecology, representing STEM

were finally selected. There was an attempt to include the ARUA's Centre of Excellence across Africa as sample PhD program. Nevertheless, ARUA's Centre of Excellence PhD program in Good Governance and Post-conflict Society at AAU, were not yet fully functional as stand-alone program. This was further confirmed by the Director of the Postgraduate studies of the University.

3.3. Samples: PhDs in Economics and Plant Ecology

The data was collected and analysed along three main themes: access to the PhD programmes, structure of the programmes and how the students and academics experienced the programme at the university.

3.3.1. Access

The master's program of economic was expanded to a PhD program in 2009. The then PhD Program in Botanical Sciences, now PhD in Plant Ecology commenced in 1989. In Ethiopian HEIs in general, the admission requirements for the postgraduate program are not set at the national level but determined institutionally. Formal application is required to start the admission process at AAU. The applicant must meet the requirements for admission to PhD degrees in Economics and Plant Ecology.

Prospective applicants must have at least a Master's degree (or qualifications recognized as equivalent to a Master's degree) from a recognized university with an MA/MSC thesis in a specific field of study or a related field. The PhD program in Plan Ecology, for instance, admits applicants who hold M.Sc. degree in Biology, Plant Sciences, and Forestry, Natural Resources Management and other biology or plant biology related fields. Moreover, they must have a minimum Cumulative Grade Point Average (CGPA) of 3.40 and above or its equivalent. If a student has a Master's degree from a foreign institution, he/she needs to submit verified documents/accreditation from relevant bodies or from ETA of the Federal Democratic Republic of Ethiopia.

Specifically, the PhD program in economics requires a Master's degree with thesis. Those who have completed a Master's degree without a thesis must have at least two publications in peer-reviewed journals or proceedings in reputable conferences relevant to the field of study. The applicants of the two PhD programs are expected to pass two sets of entrance examinations prepared at two levels. The first is institutional level which focuses on areas analytical skills (Mathematics/statistics) and language proficiency. Foreign applicants may, in lieu of sitting for entrance examination, submit the results of the GRE or equivalent examinations. However, if

applicants are from English speaking countries and did their university education in English, they do not need to present proof of their language proficiency. Students who succeed institutional level examination will sit for another level of examination prepared and administered by the Department, focusing on macroeconomics, microeconomics, mathematical economics, and econometrics.

Furthermore, the applicant shall give an oral presentation on the concept note and evaluated by the academic unit's graduate committee. The concept note has been used to evaluate whether the applicants have the required academic writing skills and scientific argument, which are important skills for the successful completion of PhD program. The aggregate result of the entrance examination and synopsis evaluation, along with other requirements, will be the basis to accept/admit to the PhD programs of the PhD program in Plan Ecology.

In general, the admission requirement for the Social Sciences and Humanities and STEM at AAU are similar, except the obvious difference of the entrance examination given at the respective department levels.

3.3.2. Structure

While the general objective of the Ph.D. Program in Economics is to generate qualified economists with the capacity to educate in institutions of higher learning, engage in independent economic research, and contribute to economic analysis and policy formulation, **t**he general objective of the PhD Programme in Plant Ecology is to produce highly skilled graduates with international standard scientific competencies and established scientific knowledge to work on and provide leadership in the scholarship of Plant Ecology.

The PhD programs in Economics and Plant Ecology have course work components. A Master's Degree in Economics is a preferred requirement to join the PhD program in Economic, because of core courses at the Master's level (Microeconomics, Macroeconomics, Mathematical Economics, and Econometrics) is a prerequisite for the PhD level courses. The course work is arranged in a semester-based manner. The program uses discipline-based and sequential courses rather than the modular modality. The total number of credits is ninety-five.

However, the courses in the PhD Programme in Plant Ecology are structured in a modular modality. The program has three compulsory modules (14 ECTS) and a PhD Thesis/Dissertation (60 ECTS). The compulsory modules include Biodiversity and Ecology; Book Reading; Independent Study; and PhD Thesis. Registered students are also required to take a total of 18 ECTS from among the elective modular courses. The Student Advisory

Committee will select from among the elective modular courses those that will be taken by each student. The overall minimum ECTS requirement for course work to complete the PhD Programme is ninety.

At both Programs, the weights of the courses are indicated in the European Credit Transfer Systems (ECTS). Ph.D. students are required to pass examinations of both core courses and field/specialization courses with a minimum grade of B. Students who have done courses of comparable standard elsewhere may seek a waiver on a case-by-case basis. To qualify for the waiver, the conditions are: (a) that course content, credits, coverage, and level should be identical; and (b) that the grade obtained in the course examination should be a minimum of B.

The other major component of the Ph.D. Programs in Economics and Plant Ecology is the Ph.D. Dissertation. The student is required to submit their Dissertation (produced as per the standards set) to the Department Graduate Council DGC through the Department. The apprenticeship model of supervision in the two programs are adopted, where two supervisors – the main and the co-supervisor – are assigned by the Department Graduate Council (DGC) to the students, considering the cooperation between area of research and the expertise of the supervisors. Supervisors are appointed and approved by the DGC and/or the Academic Commissions (AC) of the respective academic unit after considering academic credentials, research interest, merit, and other relevant parameters. The Swedish International Development Cooperation Agency (SIDA), which has been financially supporting the team supervision model at the PhD program in economics, will stop the assistance by 2023. Therefore, the supervision model would be changing into single professors supervising many students as is the case in most other PhD programmes. This demands sourcing external funding or developing a more efficient supervisor model ARUA's drive towards collaboration at the doctoral level could result in a new innovative supervisory model enabled through tapping into a broader pool of academics from other universities.

At both programs, the Dissertation will eventually be subjected to a viva voce and must be completed at least with a grade of "Satisfactory" or a letter grade of "C^{+}" in accordance with the University Legislation on Grading Thesis and Dissertations. Furthermore, as per the most recent legislation of 2019, a PhD candidate shall publish or produce evidence of acceptance for publication of at least two articles in reputable journals to graduate (Dissertation + Journal Article). Unless they fulfill this requirement, they would not be cleared to graduate and awarded the PhD Degree in economics.

The PhD degrees in Economics and Plant Ecology are both 4-year programmes of study. As stipulated in the AAU Legislation, a student can request for an extension up to a maximum of two years if he/she has legitimate reasons that is accepted by the DGC. Thus, the minimum and maximum number of years a student will stay as a PhD candidate in both programs is four and six years, respectively.

3.3.3. Experience and Support

In general AAU enjoys good infrastructures – libraries statistics support; laboratories, the provision and utilization of ICT facilities, internet bandwidth, electronic device, and writing centres *etc* at the Department, College, and Institutional levels. The PhD program in plant Ecology has sufficient facilities specific to the nature of the programs such as greenhouse, Herbarium Library; Botanic Garden; Information Technology and Specimen Digitization center; DNA Bank; Research and Teaching Laboratories, and experimental facilities. These unique educational facilities and materials to the program are adequate. There are concerns, however, most of them are getting old and are not up to date.

The PhD Program of Economics had twenty-seven academics (3 Professor; 7 Associate Professors and 16 Assistant Professors and only one MSc holder), while there were total of sixteen academic staff, (3 are MSc holders, 2 Assistant. Professor, 3 Associate Professors and eight full Professors) at the PhD program in Plant Ecology. Shortly put, the PhD programs in Economics and Plan Ecology enjoy a good supply of both material and human resources.

The average minimum and maximum overall cost for PhD in Economics and Plant Ecology were Birr 106, 500 (USD 2,130) and Birr 146, 000 (USD 2,920) respectively. Based on the current support schemes by the Government of Ethiopia, non-privately sponsored students of the PhD Programs of Economics and Plant Ecology are exempted from fees and entitled to get additional grant for conducting their Dissertation research, as per the provisions of AAU and in consultation with the Ministry of Education. The university gives dissertation research grand of Birr 40, 000 (USD 800) for social sciences and Humanities and Birr 60, 000 (USD 1,200) for STEM related fields. Since the dissertation grant is small, academic units and students/candidates are highly encouraged to source for additional funding outside of the university.

However, funding challenges are more pronounced within the PhD program in Economics compared to that of the Plant Ecology programme, with the former having additional income generation mechanisms such as sponsorship, bursaries, scholarships, assistantships;

tutoring/lecturing and assistantships through the partnership programs both locally and abroad. Therefore, both students and academics of the program not only could they attend conferences, but they also use the facilities of other universities both in the north and in the South. This emphasises ARUA aspirations to further initiate and develop more collaborative PhD programmes across its member universities to enable students and staff to benefit from international exposure, use of facilities and an overall enriched doctoral experience.

For example, the PhD program in Economics works in collaboration with the Department of Economics at Martin Luther University in Germany and the Jönköping International Business School (JIBS) at Jönköping University in Sweden as well as AERC (African Economics Research consortium). This arrangement has enabled the Department to develop teaching materials, upgrade its training and research activities, build its computer and internet access capacities, improve its program management practice, and forge a network of professional and institutional contacts. However, there has not been there sustainable funding to support other aspects of the collaboration such as travelling for conference attendance and others. But students and their advisors apply for such funding with sometimes favourable outcomes.

The PhD program in Plant Ecology also has strong North-South and South-South collaborations. It has a long-standing collaboration with the University of Oslo, Norway and Rhodes University, South Africa. The Program exchanges PhD candidates and academics with these universities. Over the last five years, a total of 32 and 40 PhD students were admitted to the PhD program in Economics and Plant Ecology, respectively. However, there has not been a student who completed the program and graduated yet with a PhD Degree in Economics. When it comes to the PhD program in Plant Ecology, thirty-five students have been successful in attaining their PhD Degrees.

In the case of both PhD programs a PhD candidate needs to complete course work with a score of 3.00 CGPA, field research, and write up of a PhD dissertation. It is a graduation requirement to publish, amongst others, preferably two articles or to publish one article and present proof or evidence of acceptance for publication for a second Article.

Table 3: Summary Table of Access, Structure and Experiences of the Sample PhD programs

Access	Structure	Experiences
- AAU's Registrar runs application process. - Online application/ registration. - Once in a year: end of August. - Master's degree (or qualifications equivalent to a Master's degree). - CGPA of 3.40 and above out of a possible 4.0. - Master's degree without a thesis must have at least two publications (for Economics only) - Dissertation Concept note - Two letters of recommendations. - Official letter for sponsorship (for non-private applicants). - Official transcripts of the master's degree. - Entrance examinations at two levels: Institutional and Departmental. - English language proficiency	- Have compulsory course work components. - A minimum grade of B on each course. - Discipline-based and sequential courses; total number of ninety-five credits (PhD in Economics) - Modular modality, at total of ninety credits (Plant Ecology) - Use European Credit Transfer Systems (ECTS). - Team supervision model. - 4-year programs of study. - Dissertation + 2 Journal Article). - A viva voce, - Grade of "Satisfactory" or a letter grade of "C	- Relatively good infrastructures - Qualified academics for supervision. - PhD in Economics: overall cost 106, 500 (USD2, 130) and Dissertation grant Birr 40, 000 (USD 800). - Plant Ecology: overall cost 146, 000 (USD 2,920) and Birr 60, 000 (USD 1,200). - PhD program in Economics: Works with Martin Luther University; Jönköping International Business School (JIBS); AERC (African Economics Research consortium). - PhD program in Plan ecology: Works with Oslo University; the Rhodes University. - In the last five years, no students completed /graduated in economics, but thirty-five graduated in Plant ecology

Chapter Four: Emerging Findings

This section distils some of the emerging findings from the institutional data and their implications for collaboration between AAU and other ARUA member universities. The findings are classified under two broad themes – enabling or constraining conditions for collaboration.

4.1   Enabling Conditions

At the systemic level, there has been a strong thrust in the higher education sector to derive innovations and transformation of the country's economy. Hence, the Federal Ministry of education highly encourages the development and implementation of Home-grown Collaborative PhD Programmes (HCPP) which can form the base for subsequent collaboration.

Institutionally, as AAU is a flagship University, it has the largest graduate programs (Masters and PhD) Compared to other universities in Ethiopia and hence long years of experience in running PhD programs, both in collaboration and internally. This gives the university a relative leverage to influence government policy directions with respect to collaboration but could also suggest that the University has the institutional capacity to enter collaborative PhD programs especially within ARUA without awaiting the will and the approval of the Federal Ministry of Education.

At the program level, the content and structure of the PhD programs are comparable with other PhD programs available internationally. They are in line with the current changes and shifts in PhD education in that they do have a course work component, structured in terms of ECTs; publications from the dissertation research and the oral defense or Viva are requirements for graduation. Moreover, they have been revised periodically to attune them with the current realities of the country and the Continent.

The PhD programs have required supporting facilities and qualified professors to supervise PhD candidates. The PhD programs have good experiences of initiating and making both South – South and North – South partnerships and collaborations. Especially, the PhD Program in Plan Ecology uses these partnerships to generate additional funding for students. The programs have been influencing, alike the institutions, policy matters and direction in their respective disciplines.

4.2   Constraining Factors

From the analysis of the data and institutional policy documents as well as secondary literature, three main constraining factors can be identified. First is the policy environment, secondly is the limited resourcing or funding for PhD programmes and lastly unsustainable collaboration programmes.

The Ethiopian higher education sector is under the same Federal ministry of education which runs all the HEIs of the country both public and private other sectors of education. This might have caused lack of attention and commitment and strategic direction to help HEIs to run collaborative PhD education, beyond the usual policy rhetoric. There has not been stand-alone national level policy and strategies for the collaboration and internationalization of PhD programs, even though collaboration and internationalization have been sporadically mentioned in other policy frameworks. The budget allocated for the higher research and innovation, which is typical feature of PhD education, has been meager, affecting the quality of PhD students' dissertation research. The supportive infrastructure at institutional and program level in the areas of STEM, for instance, PhD in plan Ecology, need renovations and upgrading as they are getting old.

The inadequate resourcing across most of the PhD programmes could be affecting the motivation of PhD students and supervisors to be actively engaged in their research to finish the PhD education on time. Hence, there are delays in the completion rates of PhD education. There are PhD candidates who could not complete their PhDs even within the maximum allowed time of six years. Hence, the graduation rates have fallen short of the current need of highly trained human capital of the country. This might be due to the   fact that most PhD students want to stay in the Capital Addis, Ababa, where there is a good opportunity for par time working.

The existing collaborative programs tend to be unstainable due to a number of reasons. Some of them are depending on external funding which can easily be terminated or will not be extended upon the initial agreed period. For example, some of the partnership programs which were financing the PhD in the Economics program have been terminated. Hence, it has been difficult to use the expertise of academics from other universities due to budgetary constraints. Other reasons for the unsustainability of the programmes might be the lack of adequate strategic planning to ensure win-win partnerships. This could lead to one partner falling out due to feeling of dissatisfaction or lack of value adding.

The application process and admission criteria to the PhD Program are too stringent, compared to other Africa University, for instance, University of Mauritius. Although it might be good to keep the quality of education, there could be also unintended consequences of limiting the expansion of PhD Education.

Chapter – Five: Conclusions and Recommendations

5.1. Recommendations

Five recommendations are proposed towards enhancing the PhD programme at the AAU and with a view towards supporting collaboration with external partners in general but within ARUA membership.

- The Federal Ministry of Education and the Ethiopian HEIs need to work together to address the hurdles of entering in and implementing smoothly the need based collaborative PhD programs both in the STEM and Social Science and Humanities disciplines. To this end, it is imperative to develop policies and strategies to mobilize resources from bilateral and multilateral partners, as funding is a serious challenge.

- The AAU also needs to develop a comprehensive internationalisation policy which integrates aspects of collaboration within the continent and with ARUA member universities. They should also work together to improve and upgrade supporting facilities for PhD education, especially in the areas of STEM. These disciplines demand cutting edging and state of the art facilities to contribute to innovation in the African continent for real.

- AAU is duty bound to conduct a study exploring the low and gender skewed graduation rates of PhDs within the institution. This is despite a fairly qualified and competent academic staff who could effectively and efficiently guide and supervisor PhD candidates.

- AAU should further investigate and support the functioning of the ARUA centres of excellence through which PhD collaboration could be initiated across other ARUA CoEs.

- There is a fertile ground and good will at institutional and program levels to enter in to and implement collaborative PhD programmes. It is good for ARUA to steer the collaboration of PhD education in Africa, by facilitating the availability of funding and resources from external partners.

- The application process and admission criteria to the PhD Program can be too stringent and so are the graduate requirements. AAU could explore various hybrid approaches to

relax the admission and completion requirements without necessary compromising the quality of the typical PhD programme.

5.2   Conclusion

At AAU, there has been a fertile ground for collaboration at institutional, college and department levels. The leadership of the university at various levels and academics do have strong zeal to collaboratively run PhD Education with other universities both in Africa and outside. However, there has not been police or strategy at national and institutional level which guides these passions and interests for PhD collaboration in a strategic way.

The PhD application process at AAU is once in a year, around at the end of August for class to commence in the early weeks of September, when the Ethiopian New Year starts. Moreover, the recruitment process seems stringent, compared to the other African Universities, having entrance examination at various stages of the University.

Although it has been believed that the ARUA centres of excellence are supposed to be run in Ethiopia, AAAU, they are not functional to date.

For a PhD programs to contribute for the socioeconomic devolvement of Ethiopian and Africa, there should be participation of all genders. Nevertheless, the participation of females in the PhD programs of AAU is limited compared to their male counter parts.

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Appendix 1

African Research Universities Alliance (ARUA)

Data Collection Instrument: Doctoral Degree Programme

Towards a Collaborative PhD Program across ARUA member universities

in the Natural Sciences and the Humanities and Social Science Disciplines

Compiled by [Name of researcher(s)]

(1)   Name of the university where the degree is offered

Programme-specific information:

(2)   Name of the faculty/school and department/centre/institute where the degree is offered

(3)   Exact name of the degree programme and qualification

(4)   Number of credits (total; elements)

(5)   Number of students/candidates enrolled in the degree programme over the last 5 years (number of enrolled PhDs)

(6)   Academic staff available for supervision / staff to student ratio

(7)   Qualification of staff (% PhD, % professors)

(8)   Graduation number in the degree programme over the last 5 years

(9)   Availability of supporting infrastructure, including institution-wide infrastructure (library; ICT support; statistics support; research hub; writing centres etc.); faculty-wide infrastructure / department / centre (e.g. laboratories, studios, postgraduate academies); and programme specific infrastructure (if any).

(10)   Is this a collaborative programme (with another institute/university)? If yes, please elaborate on any relevant aspect.

(11)   What is the history of this programme? (date started, how it might have changed with time)

(12)   What makes this programme one of the best? Any notable graduates, ranking achievements, patents or so (or other 'bragging rights' or significant achievements or recognitions worth mentioning)?

Admission requirements

(13)   Minimum prior qualification plus other requirements (e.g. masters GPA or score average points/merits; work experience; professional registration, or the like)

(14)   Application date & start date of programme (deadlines)

(15)   Formal application procedure and requirements for supporting documents (e.g. PhD proposal; CV; sample writing; etc.)

(16)   Contacting and assignment of supervisor(s)

(17)   Please comment: Are these admission requirements typical for all doctoral programmes nationally, in this institution, or are they specific to the HUM or STEM, or are they unique to this particular programme?

Structure and content of programme

    (18)   Assignment of supervisor and supervision model
  i. one student-one supervisor (traditional / apprenticeship model);
  ii. one student-several supervisors (team supervision model);
  iii. many students-several supervisors (cohort supervision)
  iv. is there a contract between supervisor and student?

    (19)   Collaborative supervision aspects and other research support (e.g. joint cohort research days; postgraduate academies; etc.)

    (20)   Provisional vs. full registration rules e.g. Is there a period when one is provisionally admitted pending some procedures? such as proposal presentation and acceptance, title registration;

Programme requirements:

    (21)   Compulsory elements (e.g. compulsory orientation; compulsory course work; minimum lab work; seminar attendance; residency requirements; professional work/internship requirement; field work requirements;)

    (22)   Other elements, e.g. exchange programmes

    (23)   Milestones and outputs of the programme:
  i. Requirement to present (inhouse or at a conference)
  ii. Requirement to publish (type and number of minimum publications)
  iii. Thesis by monograph, by professional capstone, by articles (explain all in detail)

    (24)   Duration of the programme: Minimum time to graduation; maximum time to graduation

    (25)   Financial obligations and benefits

    (26)   Costs of the programme (per annum; overall)

    (27)   Funding opportunities: availability of sponsorship, bursaries, scholarships, assistantships; tutoring/lecturing; etc.

    (28)   Conference attendance (e.g. availability of sponsorship)

Assessment of this programme

    (29)   Please comment: Is this structure and content of the programme typical for all doctoral programmes in this institution, or are they specific to the HUM or STEM, or are they unique to this particular programme?

    (30)   Please comment on the programme's comparability with other doctoral programmes you are familiar with.

    (31)   Please comment on best practices or the need to modify.

    (32)   What could be done to make the programme more harmonized with others within ARUA universities.