AAU Directory of International and some National Projects by 2018

Sida Projects Coordination Office (SCPO)

Accountable to the Office of the President of AAU

Addis Ababa University

Compiled by

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2018

ACKNOWLEDGMENT

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PREFACE

This document was prepared upon the request of Sida to be made part of the 2018-2023 AAU-Sida Five-Year Agreement. Sida was repeatedly asking for a checklist of all AAU partnership projects with international institutions. The former Grants' Coordination Office (GCO), now Sida Projects Coordination Office (SPCO), was challenged with the question and it was offered the funding to generate the necessary document, latter to become an integral component of newly AAU-Sida Five-Year Agreement signed on 07 July 2018.

As it was urgent and a vital component of the new major agreement, the SPCO took up the initiative to deploy two capable persons to reach out each AAU academic and research departments to come up with the list and abstracts of the projects as they are compiled in this booklet. That was not an easy task though. The SPCO appreciates very much all the cooperation of the departments, as they are the sources of these data. It was not however easy to find the appointments, collection of the information, repeated visits to each department and even there were departments that hesitated to dish out the topics and abstracts of their projects.

Again, with the kind and humble cooperation of most departments, the checklist of AAU international and some national partnership projects was generated in time to feed into the new AAU-Sida Agreement.

The SPCO does not believe these are all the partnership projects AAU has internationally. There are some others that were for some reasons did not supply the SPCO with the information. The SPCO hopes that in the future all departments would take part in this documentation. As this document will be available on AAU website, it will increase the international visibility of each researcher, the projects he or she is running, the respective departments and AAU itself for that matter.

The order of appearance of the AAU colleges, departments and the individual projects in each department is simply arbitrary. Any errors of reporting are the responsibilities of the SPCO.

Once again, the SPCO extends its heartfelt gratitude to all departments and researchers who participated in this documentation, and the two commissioned AAU staff, namely, Dr. Tadesse Fetahi and Ms. Mastewal Moges. The assistance of the Office of the President of AAU is always appreciated.

Brook Lemma, Professor

Coordinator of SPCO, AAU

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COLLEGE OF NATURAL AND COMPUTATIONAL SCIENCES

Institute of Biotechnology (IoB)

Project title: *Application of Biotechnology for Environmentally Safe and Sustainable Food Security and Green Development of Ethiopia*

Project leaders: Dr. Tesfaye Sisay, Associate Professor

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Project description: Today biotechnology is considered as the main driver of the emerging bio-economy in the world promoting sustainable green growth. Thus, biotechnology proved to be very important for agricultural, industrial, health, and environmental applications. In recent years, the Ethiopian government, recognizing the potential of biotechnology for the country's sustainable development, has established biotechnology centers in a number of higher education and research institutions. However, biotechnology, being knowledge- and capital-intensive discipline, many of these institutions suffers from shortage of a critical mass of trained work force and lack the necessary laboratory facility to carry out sustained innovative research and training. The Institute of Biotechnology (IoB) at AAU is the main institution mandated by the government to train the required work force for all biotechnology departments and institutes throughout the country and play a leading role in carrying out innovative research to address the country's major development challenges. However, IoB at AAU, though relatively well staffed and is based on decades of experience, is not still fully self sufficient to meet these challenges. Therefore, it is important to form partnerships and collaborations

with well-established institutions, such as SLU. Development of a sustainable bio-economy that promotes green growth mainly depends on sustainable use of the available biodiversity using modern biotechnological techniques. Therefore, plant, animal, and microbial biodiversity are the main driving forces of the modern bio-economy that serve as a source of new products and services. Ethiopia as Vavilonian gene center of crop diversity is endowed with an enormous biodiversity that can serve as a platform to establish a successful bio-economy. Above all, Ethiopia has a unique microbial diversity, many of them found in extreme habits, not found anywhere else in the world. The first objective of this proposed project is to train Ethiopian students at PhD and MSc level in modern biotechnology and to develop capacity for research. The project will be a collaborative effort between SLU from Sweden and AAU from Ethiopia and aims at utilizing the country's biological resources to develop novel products and services. In the project's lifespan, it is planned to train a total of 24 PhD and 30 MSc students from Ethiopia in modern biotechnology. Students will carry out their research in a sandwich mode and will be jointly supervised by staff from both partner Universities. A total six subprojects encompassing agricultural, industrial, health, and environmental biotechnology were identified. Under each sub-project, titles of specific PhD research projects are identified. Under each sub-project, PhD students will employ innovative biotechnology tools to address their specific topics.

Partners: Swedish University of Agricultural Sciences-SLU

Supported by: Sida

Project period: 2018-2022

Total budget: 124,209,246 ETB

Project title: *Enhancing Food Security through Improved Productivity, Nutrition and Marketing of Chickpea in Central and Western Ethiopia*
Project leader: Kassahun Tesfaye (PhD),
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Project description: Agriculture in Ethiopia forms the basis of the economy, with 80% smallholder farmers. These farming systems are characterized by low yields, widespread use of unimproved landraces, outdated production technologies and biotic and abiotic stresses. In western and northern western Ethiopia, soil acidity and consequent aluminum toxicity are a primary limitation to crop productivity, especially for chickpea (*Cicer arientinum*). Chickpea is the world's second most widely grown pulse crop and a major source of human protein nutrition. Forty percent of Africa's chickpea crop is grown in Ethiopia, where cultivated acreage has increased from 140,244 ha to 229,720 ha during the past decade. However, Ethiopia's chickpea yields remain low (1.8 t/ha; CSA 2006, 2014), well below yield potential. This yield gap derives from a shortage of improved technology and limited availability of high-yielding, stress tolerant varieties. Among the constraints to chickpea, production is its sensitivity to Aluminum toxicity, which is a defining feature of low pH soils that are widely distributed in Ethiopia. It is critical to identify tolerant germplasm and understand the molecular genetic basis of aluminum tolerance. Moreover, because chickpea yields depend on beneficial soil microorganisms, especially nitrogen-fixing symbiotic bacteria and phosphate solubilizing microorganisms (PSMs), a parallel need is to identify acid/Al-tolerant chickpea microbes. A novel aspect of the proposed work is the incorporation of alleles

from chickpea's wild progenitor species, *Cicer reticulatum*, into cultivated germplasm. The analysis of genome data from 1,000 wild and cultivated *Cicer* species accessions reveals a massive (five folds) reduction in genetic diversity in the cultivated species, suggesting that wild species are likely a reservoir of useful adaptations, including tolerance to acid soils. We will exploit these reverse-introgression populations to discover and deploy chickpea genes for tolerance to acid soils. The outcome of the proposed work will be increased food security in acidic soil regions of Ethiopia.

Figure showing Dr. Kassahun Tesfaye at field evaluation of Chickpea in 2016 cropping season

Partners: Prof. Douglas Cook; University of California, Davis;

Supported by: USAID Via US National Academy of Sciences as part of PEER Grant

Project period: 2015- 2018

Total budget: 5,137,704 ETB

Project title: *Unravelling the molecular genetics of finger millet blast disease and the existing resistance for the development of high-yielding resilient varieties.*
Project leader: Dr. Kassahun Tesfaye, Associate Professor
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Phone: 0911 882067 (Cell)

Project description: Finger millet, *Eleusine coracana*, is an important staple upon which millions depend for food and rural household incomes in eastern Africa. It is more nutritious than other cereals and when malted it is particularly valued by breast-feeding women, as a weaning food that provides more energy per feed than those based on gelatinized starch and a nourishing food for invalids and diabetics (Chandrashekar 2010; Duke 1983). It is a popular smallholder food, fodder and cash crop. In recent years, market demand has increased, offering new opportunities to commercialize production, which is seen as a pathway for prosperity in the dry lands (Schipman-Schwarze *et al*. 2013). Finger millet grows well with minimal inputs in marginal environments and it is often the only reliable food source for the very poor in times of drought and crop failure (Kotschi, 2006).To date, little work has been done to improve this orphan crop, which typically yields only one third of its genetic potential of 6 ton/ha (Oduori, 2008). This is because most finger millets found in farmers' fields are landraces and these unimproved varieties are routinely challenged by the devastating blast disease, caused by the fungus *Magnaporthe oryzae*, which results in up to 90% yield losses in combination with other abiotic stresses (Mgonja *et al*. 2007). The focus of our project is on enhancing our understanding of the diversity and virulence/aggressiveness of pathogen races of the blast fungus *Magnaporthe orzyae* in eastern Africa including Ethiopia,

specifically those races that infect finger millet. This information will be used as a launch pad to enhance finger millet cultivars for blast resistance.

Field sample collection of finger millet blast pathogen, 2015 cropping season by Dr. Kassahun Tesfaye

Partners: Dr Santie de Villiers, Senior lecturer, Pwani University, Kilifi, Kenya

Supported by: Bill & Melinda Gates Foundation as part of PEARL Grant

Project period: October 2015-September 2019

Total budget: 929,703 ETB

Project title: *Study on the potential of some neglected and underutilized tuber crops in Ethiopia for their contribution to sustainable food security*

Project leader: Dr. Kassahun Tesfaye, Associate Professor

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Phone: 0911 882067 (Cell)

Project description: This Swedish Research Link (SRL) project will extend and deepen the already existing cooperation among Swedish and Ethiopian research institutions in the areas of conservation of genetic resources and plant breeding for sustainable food security. The project will be carried out through extensive field surveys in Ethiopia whereby populations of two tuber crops [Ethiopian Potato (*Plectranthus edulis*) and Anchote (*Coccinia abyssinica*)] will be collected and characterized using different markers. The genetic diversity of the collected germplasm will be assessed using morphological and molecular markers. After the analysis, representative germplasm will be provided to the Ethiopian Biodiversity Institute (EBI) for *ex-situ* conservation. Genetic diversity hot spots will be identified through the analysis. Nutritional analysis of the collected tubers will be carried out in order to reveal variation in their nutritional and anti-nutritional components. The molecular and nutritional analyses will be carried out mainly by AAU researchers/PhD students at SLU, Alnarp. Field surveys, collections and field trials of the germplasm will be done in Ethiopia. For more details, see enclosed project plan.

Field Evaluation of Anchote (*Coccinia abyssinica)* in 2014 cropping season by Dr. Kassahun Tesfaye and his PhD students

Oromo Dinich/Woliyta Don (*Plectranthusedulis*) Field Evaluation by AAU PhD students in 2014 cropping season

Partners: Dr Mulatu Geleta, Associate Professor, Department of Plant Breeding, Swedish Agricultural University, Sweden

Supported by: Swedish Research Council, Sweden

Project period: January 2014 to June 2017

Total budget: 1, 508, 268 ETB

Project title: *Improving Wheat for Resistance to Septoria Diseases in Ethiopia through the Applications of Molecular Techniques*

Project leader: Dr. Kassahun Tesfaye, Associate Professor

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Project description: Ethiopia is the second highly populated country in Africa and the agriculture sector supports large segments (87%) of its population. Smallholder farmers cultivate the majority of the land following traditional management practices with outdated technologies. In spite of its multiple importance as food and income, the average wheat productivity of the country is by far below (2.37 t/ha) the global average (3.27 t/ha). A number of biotic and abiotic factors are known to contribute to low productivity in wheat. Currently, up to 82% of wheat production loss in major wheat growing areas of the country has been attributed to two *Septoria* diseases namely *Septoria tritici* blotch (STB) and *Septoria nodorum* blotch (SNB) caused by the fungus *Septoria tritici* (sexual state: *Mycosphaerella graminicola*) and *Septoria nodorum* (sexual state: *Leptosphaeria nodorum*), respectively. In addition, 40.9 % of Ethiopian soils are acidic and these soils cause significant yield reduction in crop plants due to the phytotoxicity of the aluminum ions and low phosphate availability. Soil acidity is another important limiting factor of wheat production in central, western and northern Ethiopia. Nowadays, the identification and use of disease resistant and stress tolerant cultivars is seen as the best, cheapest, durable and environmentally friendly method to manage biotic and abiotic stresses including *Septoria* diseases and soil acidity. In this

regard, molecular marker technology combined with field genotyping is widely used to speed up the crop improvement program through precise detection of genotypes with desirable agronomic traits. However, in Ethiopia, the application of molecular tools in crop improvement is greatly missing. However, in Ethiopia, the application of molecular tools in crop improvement is greatly missing. Therefore, the current three years research project has been jointly designed by researchers from various institutions and disciplines to initiate active marker-assisted wheat breeding program to develop durable *Septoria* resistant and soil acidity tolerant wheat cultivars in Ethiopia and contribute to increased and stable wheat production in Ethiopia. In this project, *Septoria* infected wheat samples will be collected from major wheat belts of Ethiopia, and pathogen physiologic races, virulence spectrum and genetic diversity will be analyzed. In addition, significant number of commercial wheat cultivars will be screened for their resistance to *Septoria* through greenhouse gene- for- gene test and SSR markers. Moreover, large sets of bread wheat and durum wheat lines will be evaluated under field condition and later genotyped using SSR markers linked to candidate genes effective for *Septoria* resistance and soil acidity tolerance. Finally, trait- marker association will be generated for possible use in marker assisted breeding. Successful completion of the project is expected to come up with improved and durable *Septoria* resistant and soil acidity tolerant wheat lines that would contribute to increased and stable wheat production by resource poor smallholder farmers to feed their families and generate more income. Thus, outcomes of the project will significantly contribute to ensure food and nutrition security programs of Ethiopia, and the region at large. Moreover, it will have significant contribution to human capacity development in plant molecular breeding, knowledge and technology generation and research network establishment among national institutions for further crop improvement researches.

Field Evaluation of Bread Wheat at Kulumsa in 2016 cropping season

Field Evaluation of Durum Wheat at Holetta in the same cropping season

Partners: Oromia Agricultural Research Institute and Ethiopian Institute of Agriculture

Supported by: Ministry of Sciences and Technology (MoST), Ethiopia

Project period: 2016 to 2019

Total budget: 2,439,998 birr

Project title: *Industrial enzymes for sustainable bio-economy: scale-up of enzyme production and formulation*

Project leader: Dr. Amare Gessesse, Associate Professor

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Project description: To date Africa's participation in the global economy is largely confined to supplying raw materials. Adding value to these raw materials is expected to lead to economic growth and improvement in the standard of living. In Eastern Africa, because of availability of raw materials, developing capacity in the leather, textile, pulp and paper, detergent, and starch industries is believed to offer competitive advantages. However, some of these industries are highly associated with environmental pollution. Recently developments in industrial biotechnology, defined as the use of enzymes or microorganisms for industrial processes, has offered a viable option to decrease or avoid environmental pollution from such industrial activities. Widespread use of enzymes in industrial processes, in addition to lowering the level of pollution, could lead to improvement in product quality and/or process efficiency. Thus, availability of enzymes locally with affordable price and with expert support on their use is expected to have significant contribution in the region by lowering environmental pollution and by replacing several imported chemicals as processing aids. Furthermore, because of the availability of unique habitats, such as alkaline environments, hot springs, etc., with huge microbial diversity, the region could be, in the long term, highly competitive in the global industrial enzyme market. For example, one enzyme isolated by Genecor, an American biotech company, from a Kenyan soda lake was estimated to earn the

company over US $600 million annually. In the last few decades, through research conducted in the different institutions several novel microbial strains producing potentially attractive enzymes for industrial application were isolated and characterized. Cultivation conditions for these organisms have also been optimized. Evaluation of some of these enzymes under application conditions gave extremely encouraging results. Given the importance of these enzymes in serving as processing aids in different industries in the region and their role in significantly reducing environmental pollution, scaling up of production processes and use of the enzymes at industrial scale is felt absolutely essential. The main objectives of this study are therefore, to scale up production, optimize enzyme stabilization and formulation, and test the enzymes under application conditions. Enzyme producing microbial strains earlier isolated will be grown in large scale using solid-state fermentation or submerged fermentation. The enzymes will be concentrated, stabilized, and formulated for industrial application. These enzymes will then be used for leather processing, textile processing, protein hydrolysis, detergent formulation, as animal feed additive, pulp bio bleaching, etc. Testing will be carried out at factory settings in different factories in the region. For products where enzymes are already in use (such as bating agents in the leather industry) the new enzymes will be compared with commercial enzymes and the best enzyme selected and promoted for use in the region. For processes where enzymes are not used (usually for reason of cost) factories will be encouraged to adopt the technology by giving them free samples. The technology developed will then be popularized through different channels. A workshop will be organized for enzyme users in the region and different industries will be encouraged to use these products. Similarly, workshops will be organized for business people in the region to attract their attention and encourage them to invest in this technology. A company specialized in the production of industrial enzymes in

partnership with private sector (and if necessary foreign partners) will be established. Successful implementation of this project is expected to help the region to develop the industrial sector with little or no environmental pollution. As Africa's microbial biodiversity is unique, in the medium to long term, the region could gain access to a significant slice of the global enzyme market.

Supported by: Ministry of Science and Technology (MoST)
Project period: 2016—2018
Total budget: 4,950,000 ETB

Department of Chemistry

Project title: *Affordable Hybrid Technology for Water Purification*

Project leader: Dr. Feleke Zewge, Associate Professor

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Project description: The goal of this project is to develop affordable high performance solar powered hybrid technology for water purification using electrochemical method and adsorption/ion exchange and to establish mechanisms to implement sustainably the proposed technology in rural Ethiopia. To achieve this, the project aims to combine the research capacity at both Addis Ababa University and Ambo University, including fieldwork together with the National Fluorosis Mitigation Project Office (NFMPO) under the Ministry of Water, Irrigation and Energy (MoWIE) and NGOs (Oromo Self Organization) to ensure long-term sustainability. The planned tasks as described in the project proposal include

- **i.** Synthesis and further characterization of adsorbents developed at Addis Ababa University and batch/continuous laboratory studies,
- **ii.** Laboratory experiments with continuous electrolytic system using DC power supply and solar panel,
- **iii.** Preliminary testing of the hybrid system,
- **iv.** Point of use system development and field testing using hybrid adsorbents developed in our lab,
- **v.** Field implementation of the hybrid technology at community scale,

vi. Assessment of socio-economic factors and develop business plan for further dissemination.

This project also has an important goal of capacity and human resource development for water purification in Ethiopian Universities and Water Sector Organizations in terms of knowledge, research, and technology implementation capacity. The participation of NFMPO and NGO will strengthen the linkage between research and implementation to facilitate technology transfer to end users. The results will be disseminated to end users of the proposed technology and to the scientific community through publication in reviewed journals. In addition one launching workshop and one national workshop is planned to communicate about the project before commencement and the results to various stakeholders involved in WASH activities in Ethiopia at the completion of the project. The result will be useful to the community, schools, health centers, recreation centers, and various industrial and agro-industrial establishments to provide safe water. This research will

i. Advance our scientific understanding of the ability and mechanism of ion adsorption by novel aluminum-based materials, composites oxides, aluminum amended materials such as concrete,

ii. Establish the foundation for implementation of solar energy powered water purification systems, and

iii. Advance our fundamental understanding of how social entrepreneurship can improve the sustainability of water purification technologies in the Ethiopian context.

Partners: Ministry of Water, Irrigation and Electricity; and Ambo University

Supported by: Ministry of Science and Technology, FRDE

Project period: 2016-2018

Total budget: 4,446,566.00ETB

Project title: *Development and Field Testing of High Performance Aluminum Oxide Technologies for Fluoride Removal in the Ethiopian Rift Valley*

Project leader: Dr. Feleke Zwege, Associate Professor

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Project description: The **aim** of the research project is to develop and compare technical performance of high capacity aluminum oxide based technologies for fluoride and to explore ways of enhancing the economic, social and technical sustainability of implementing these methods in the Ethiopian Rift Valley. According to a recent estimate of the Ethiopian Ministry of Water and Energy, more than 11 million people in Ethiopia are at risk of high fluoride in drinking water in the Rift Valley region. Over 40% of deep and shallow wells are contaminated with fluoride concentrations of up to 33 mg/L, which is significantly higher than the present WHO guideline value of 1.5 mg/L. Over 80% of children suffer from different degrees of dental fluorosis, and skeletal fluorosis is increasing, mainly among adults and older people. Fluoride-free alternative sources are scarce in the arid and semiarid part of the Rift Valley, and mitigation of this health problem has been hampered mainly by the lack of a suitable, inexpensive removal method. The extremely high fluoride levels in water demonstrate the need to look for fluoride removal material with very high fluoride removal capacity. To date there have been very few implementations of such a system in Ethiopia on a field scale mainly due to the lack of an efficient, inexpensive, acceptable removal method. A switch to treated surface waters for drinking is being assessed, but it is well recognized that fluoride removal systems are required for communities without any alternative drinking water

supply sources. Commercially available methods for fluoride removal suffer from prohibitively high cost for applications in remote villages of developing countries (e.g., reverse osmosis, activated alumina and ion exchange) or relatively poor sorption capacity (e.g., bone char, contact precipitation and other locally available sorbents such as clays and zeolites). To date there have been only few field trials of such systems in Ethiopia. Thus, there is a pressing need for low cost, high capacity, and sustainable water treatment technologies for fluoride removal - the subject of this proposed research. Sustainability requires technical efficiency, local availability, economic and social viability, and simplicity of operation and maintenance. While motivated by challenges in rural villages of Ethiopia, research results will also benefit those living in rural communities of other East African countries impacted by fluoride. The overall objective of this research is to develop, characterize, and evaluate the effectiveness and sustainability of innovative high capacity aluminum oxide based materials and composite oxides for fluoride removal in rural villages of Ethiopia. The project will also look at socioeconomic and entrepreneurial aspects to find ways to make the technologies sustainable in the Ethiopian context. To achieve this, the project aims to combine technical and social research at both Addis Ababa University and the University of Oklahoma, including fieldwork together with NGOs (Catholic Relief Service and Oromo Self Organization) and the Ministry of Water and Energy (MoWE) to ensure long-term sustainability. The planned tasks as described in the project proposal include:

1. Optimization of an aluminum oxyhydroxide (AO) adsorbent developed at Addis Ababa University and a hybrid process using the Nalgonda technique (NT),

2. Synthesis, characterization, and adsorption studies with new adsorbents (manganese oxide modified aluminum oxyhydroxide and aluminum-amended natural zeolites and clays),
3. Preliminary field testing of new all adsorbents,
4. Field testing of the most promising method(s), and
5. Assessment of socio-economic factors and presentation of findings in workshops and training sessions.

In collaboration with Oklahoma University, we will utilize social entrepreneurship principles to help develop a sustainable fluoride mitigation approach. This project also has an important goal of capacity and human resource development for fluorosis mitigation in Ethiopia. It aims at strengthening the knowledge and research capacity in Ethiopia. The participation of the MoWE and NGOs will consolidate the ties between research and implementation. Furthermore, the results will be applicable not only to Ethiopia but also for other fluorosis-affected East African countries that share the Great East African Rift Valley. The results will be disseminated to the scientific community through publication in reviewed journals. In addition, one national workshop is planned to communicate the results to various stakeholders involved in WASH in the Rift Valley of Ethiopia. The result will also be useful to various development organizations working on fluorosis mitigation as part of their overall WASH activities in Ethiopia and beyond. This research will:

1. Advance our scientific understanding of the ability and mechanism of fluoride removal by aluminum oxy hydroxide and mineral composites (e.g., amended natural zeolites and clays) for enhanced uptake of fluoride,
2. Evaluate the suitability of these materials for either reuse or permanent disposal, and

3. Advance our fundamental understanding of how social entrepreneurship can improve the sustainability of these water treatment technologies.

This current proposal will partner with the NSF project "Sustainable Drinking Water Adsorptive Materials for Arsenic and Fluoride Removal in Emerging Regions" awarded to the University of Oklahoma which aims to utilize colloid and surface chemistry principles to produce effective and sustainable water treatment material for arsenic and fluoride removal in developing countries.

Partners: The University of Oklahoma, USA

Supported by: Partnership for Enhanced Engagement in Research (PEER) Science Program, USA

Project Period: 2014-2017

Total Budget: 3,313,610.00 ETB

Project title: *Africa Centre of Excellence for Water management*

Project leader: Dr. Feleke Zewge, Associate professor

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Project description: Water in Africa is a vital resource for overall socioeconomic development and must be seen as an instrument for regional integration. The essential role of water in sustaining life, development, and life-supporting environmental resources is well recognized. However, the Eastern and Southern African (ESA) Countries face largely similar challenges in water resources; - droughts, floods, erratic rains, chronic food insecurity; water borne diseases accounting for large share of disease incidence in the region and in this respect, water availability has become a major constraint in realization of socio-economic development.

Although all ESA Countries have progressed to develop the national water resources strategy and at various stages in the development of Integrated Water Resources Management (IWRM) plans, the process of implementation has been much slower. Inadequate data and information, weak inter-sectorial coordination, low human capacity, poor financing are widely cited as negatively impacting capacity to manage of water resources effectively.

Globally, at least 783 million people still do not have access to safe drinking water and 2.5 billion people still lack access to improved sanitation. Majority of this population is in the Sub-Saharan countries. Major issues are related to equity of access, level of service, water quality, and sustainability of water resources. Meeting basic needs such as safe drinking water, food security,

ecological flows, and prevention of water quality deterioration are the key areas of focus. Building human and institutional capacity to assess the resource, data generation networks for the water cycle, and creating efficient retrieval, storage, analytical and dissemination systems will be essential.

In this regard, the major development challenges in Ethiopia and ESA countries are:

1. Poor funding for upgrading teaching and research facilities to international standards that will ultimately lead to international research collaborations.
2. Shortage of human capital to address water-related development challenges
3. Lack of funds to initiate multidisciplinary, multi-site (National, Regional) researches that are demand-driven and problem solving to stimulate regional and national development.
4. Problem of attracting foreign students
5. Lack of Entrepreneurs in the water sector
6. Low adoption of research findings from African Universities due to low quality of research approach and seemingly uncoordinated needs assessment.
7. Low technical and managerial capacity of sector institutions

The need for critical mass of human resources required is highlighted in the Ethiopia's Growth and Transformation Plan (GTPII) and Africa's Science and Technology Consolidated Plan of Action (CPA), and the Africa Water Vision (AWV) for 2025. The AWV calls for a new way of thinking about water and a new form of regional cooperation.

The motivation of this Centre of Excellence is to develop and establish a collaborative world-class center of excellence to be known as the "*African Centre of Excellence for Water Management* (ACEWM)" in Addis Ababa

University (AAU), Ethiopia. The most important rationale for establishing ACEWM is the need for development of highly skilled human resource capable of handling more complex water management problems in a holistic, integrative and transformative approach. This includes teaching, innovative research, internships, on job technical training and community outreach programs using broad-based partnership approach.

The project envisages becoming a leading teaching and research Centre in facilitating equitable and sustainable use and management of water resources for poverty alleviation, socioeconomic development, regional cooperation and the environment in Africa with the objectives of:

1. Strengthen AAU's teaching and research capacity in water science and technology to train critical mass of human capacity required to address national and regional development needs,
2. Enhance the capacity of faculty and students to conduct state-of-the-art research and scholarly activities in order to help solve regional problems in water management and climate change issues as well as provide trained research scientists and engineers to support national and regional development goals, and
3. Provide training and support for the development and adoption of best practices in teaching, research, academic administration, and management through regional and international partnerships, coupled with mobilization of African Diaspora scientists.

The ACEWM is an interdisciplinary program, which will concentrate on existing capacity and develop new capacity to facilitate collaboration across disciplines and across organizations on long-term programmers and projects of direct relevance to Africa's water sustainability. The ACEWM will have the following five technical units and one core laboratory:

1. Water Supply and Sanitation Unit
2. Water and Wastewater Technologies Unit
3. Water Quality Management Unit
4. Water Resources and Hydrology Unit
5. Aquatic Ecosystems Unit
6. Core Laboratory

ACEWM will implement its programs with National Partners, Regional Partners and International Partners. Seven (7) departments/centers/institutes of AAU are participating in ACEWM. Five (5) national universities and four regional universities will take part. Government sector partners under the Ministry of Water Irrigation and Electricity (The Ministry itself, Ethiopian Metrological Agency, Ethiopian Institute of Water Technology, Ethiopian Water Works Design and Supervision Enterprise, Ethiopian Water Works Construction Enterprise and Regional Water sector organizations) will be actively engaged in the project.

Sponsored by: The World Bank

Project period: 2017-2021

Total budget: 125,000,000 ETB

Project title: *Synthesis and Characterization of Conjugated Polymers and Biomaterials for Solar Energy Conversion, Storage and Sensors*

Project leader: Professor Wendimagegn Mamo

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Project description: The main objective of this project is to synthesize and characterize new small molecules, conjugated polymers and polymer/ nanomaterial and biomaterial composites to improve the power conversion efficiency of organic solar cells and charge storage capacities of super capacitors and batteries. The materials synthesis efforts will also be further diversified to find conjugated polymer/nanomaterial combinations for designing cheap, stable and effective electro-catalysts for fuel cells, sensors and wastewater treatment technologies. This multi-disciplinary research venture aims at the acquisition of practices that will enable our laboratories to educate students and researchers to internationally recognized standards of scientific excellence. The training of many young Ethiopians at the MSc and PhD levels will help to develop critical human resource with requisite scientific skills in research techniques for the synthesis and characterization of materials for renewable energy applications. The enhanced research and training capacity will allow internationally competitive research and will promote our place as a focal point for researchers in sub-Saharan Africa. The well-equipped and sustainable research environment that we create will develop into a Center of Excellence that supports successful development and application of research tools for materials chemistry and will eventually help to minimize the brain drain of first class students from sub-Saharan Africa.

Partners: Chemical Engineering/Polymer Technology Chalmers University of Technology, Gothenburg and the Department of Physics, Chemistry and Biology (IFM), Linkoping University, Sweden

Supported by: International Science Program in Chemical Sciences (IPICS) a branch of International Science Program, Uppsala University, Sweden

Project period: 2014-2016

Total budget: 3,173,732.40 ETB

Project title: *Bioplastics from African Iron Weed: A supercritical approach*

Project leader: Dr. Yonas Chebude

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Project description: This project attempts to process new degradable bioplastics from *Vernonia galamensis* (Iron Weed): A supercritical approach with the Scientific aims of:

1. To develop an effective, low temperature and solvent free route to *vernolic* acid from *vernonia* oil
2. To retain the important epoxide, *olefinic* and carboxylic functionality
3. To scale up the process to multi kg
4. To convert *vernolic* acid into polymers and copolymers utilizing supercritical fluid technologies and exploiting enzymatic catalysts
5. To scale up the polymer syntheses and create samples for application tests of relevance to the polymer industry sector

Partners: Prof. Steve Howdle, Dr. Simon Bassett, Dr. Dominika Regentova, Mariana Gameiro (PhD student), School of Chemistry, University of Nottingham, UK, Yaregal Awoke Genet, PhD student, Chemistry department, AAU

Supported by: The Royal Society, UK

Project period: 2016-2018

Total budget: 336,000.00ETB

Project Title: *Catalytic Conversion of Vernolic Acid into Added Value Chemicals*

Project leader: Dr. Yonas Chebude

Email: yonas.chebude@aau.edu.et

Phone: 0111239466 (Office)

Project Description: Epoxy oils are important industrial chemicals for the manufacture of lubricants, plastic formulations, protective coatings, and other products. Current industrial techniques are expensive, generate substantial quantities of chemical waste, and produce high viscosity oil. *Vernonia galamensis*, is the world's only source of naturally epoxidised vegetable oil. The seed contains 40-42% oil, and the *vernolic* (*cis-12,13epoxy-cis-9-octadecenoic*) acid content of the oil falls in the range 72-78%. The oilseed plant *Vernonia* is promising to be an excellent renewable source of industrial chemicals. Though it has been grown successfully in a variety of locations, *Vernonia* thrives particularly well in Ethiopia. The proposed added value chemicals from *vernolic* acid are going to be obtained via epoxidation, esterification or polymerization reactions; we plan these reactions using enzymes as catalysts either supported in ordered mesoporous materials or in combination with ionic liquids in order to fully avoid the use of organic solvents.

Partners: Professor Diaz Carretero and Professor Maria Isabel from Insto. Catalisis Y Petrolequimica (CSIC), Betaqimica, Spain

Supported by: the Spanish Government

Project Period: 2016-2018

Total Budget: 456,000.00 ETB

Department of Earth Sciences

Project title: *Hidden Crisis: Unravelling Current Failures for Future Success in Rural Groundwater Supply*

Project leader: Dr. Seifu Kebede

Email: seifukebede@yahoo.com

Phone: 0911421168 (Office)

Project description: The overall aim of the project is to build a robust, multi-country evidence base on the causes of the unacceptably high rates of groundwater system and service failure in WASH and use this knowledge to deliver a step-change in future functionality. To achieve this aim, the research draws on an interdisciplinary approach using the latest thinking and techniques in both natural and social science to unravel local hydrogeological conditions and institutional arrangements, and applies them to Malawi, Ethiopia and Uganda.

Partners: British Geological Survey, Overseas Development Institute-UK, University of Flanders-Australia, WaterAID, Sheffield University, University of Makerere, University of Malawi, University of Cambridge-UK

Supported by: National Environmental Research Council- UK

Project period: 2015-2019

Total budget 1.9 million £ of which AAU's budget is 113,000 £ (3,500,000 ETB)

Project title: *Monitoring the Impact of the 2015/16 El Niño on Rural Water Insecurity in Ethiopia: Learning Lessons for Climate Resilience*

Project leader: Dr. Seifu Kebede

Email:seifukebede@yahoo.com

Phone: 0911421168

Project description: The 2014/2015 El Niño-related drought in Ethiopia provided an important research opportunity to:

1. Gather robust evidence on the behavior under stress of shallow groundwater sources (mountain springs, valley springs, wells, boreholes);
2. Monitor the timing and magnitude of changes in water availability and quality; and
3. Assess the ways in which changes in water access and quality affect different communities and economic status within them, and the coping strategies these groups employ.

New evidence can inform actionable recommendations for long-term resilience-building through better characterization of vulnerable areas and groups and identification of more resilient types and designs of water point, together with the institutional infrastructure needed for implementation. The research brings together an experienced team from BGS, ODI, and AAU, all of whom are currently working in Ethiopia, supported by partners in the meteorological department at the University of Reading and WaterAid UK, and MoWIE and CARE in Ethiopia.

Partners: British Geological Survey, Overseas Development Institute-UK, Addis Ababa University, University of Reading, WaterAID UK, Ministry of Water Irrigation and Electricity-Ethiopia

Supported by: National Environmental Research Council- UK

Project period: 2015-2019

Total budget: 45000 ETB

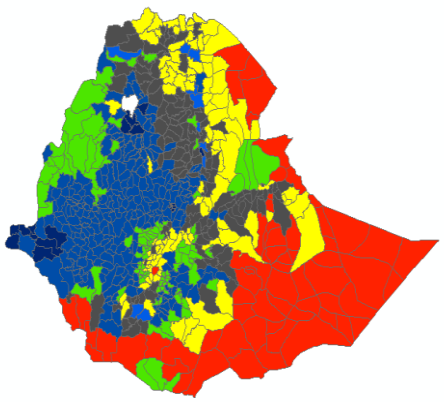
Project title: *Developing Tools for Predicting Drought Impact on Rural Water Supply under Emergency Conditions*

Project leader: Dr. Seifu Kebede

Email:seifukebede@yahoo.com

Phone: 0911421168

Project description: Delivery of WASH services during emergency (drought, WASH related diseases, floods and other natural hazards) situations in Ethiopia is hampered by lack of data/evidence on the scale of the impact of the stressor (eg climate change, drought, etc.) on availability of drinking water to communities. During such emergencies, decision makers and development partners face enormous challenge, as to how to prioritize the intervention and reach the most affected and vulnerable communities. The overall aim of this project is to develop a GIS supported hydrological tool to predict WASH requirements during emergencies for Humanitarian Response purposes,



Groundwater drought index map of Ethiopia (red: vulnerable, blue: less vulnerable)

Partners: Addis Ababa University, Unicef

Supported by: UNICEF-Ethiopia

Project period: 2016- Nov 2017

Total budget: 450,000 ETB

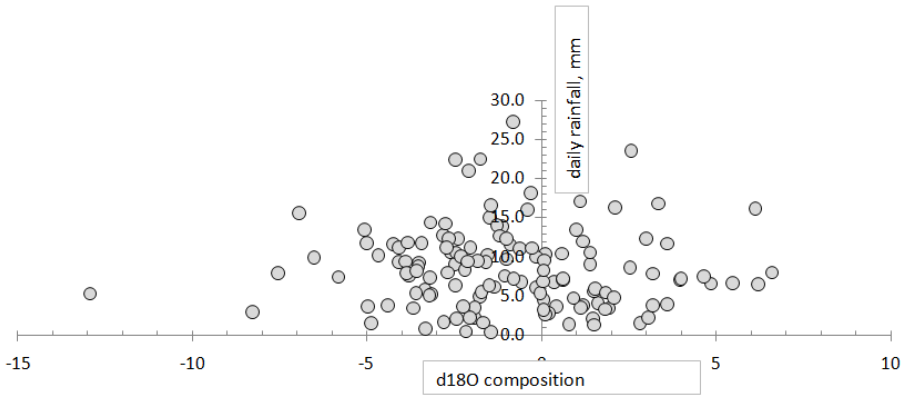
Project title: *Isotopes in Tropical Rainfall: Origin of Isotopic Signals in Ethiopia Meteoric Waters*

Project leader: Dr. Seifu Kebede

Email:seifukebede@yahoo.com

Phone: 0911421168

Project description: The origin of the $\delta^{18}O$ and $\delta^{2}H$ composition of meteoric waters in Ethiopia remains unexplained or at its best, it is debatable. The meteoric waters (rainfalls and its derivatives such as groundwater, lakes and rivers) in Ethiopia are the most enriched compared to any place in tropical setting. The composition has long been recognized as regional anomaly. This is regardless of its furthest distance from the Atlantic Ocean (presumed source of moisture), higher mean altitude (>2000 meter) and low mean annual temperature ($17^{O}C$) which characterizes the regional setting. The aim of the research it to investigate the origin of isotopic signal of meteoric waters in Ethiopia using daily sampling of rains.



Partners: Addis Ababa University Ethiopia and eight other IAEA member states

Supported by: The International Atomic Energy Agency (IAEA)

Project period: 2013 - 2017

Total budget: 100,000 ETB for two 2 years with possible renewal for another two years

Center for Environmental Sciences

Project title: *Climate Impacts Research Capacity and Leadership Enhancement (CIRCLE)*

Project leader: Dr. Teshome Soromessa

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Phone: 0911210275 or 0913245500

Project description: The Climate Impacts Research Capacity and Leadership Enhancement in Sub-Saharan Africa (CIRCLE) program is an initiative of the UK's Department for International Development (DFID) to develop the skills and research output of early career African researchers in the field of climate change and its local impacts on development. The program will also work with institutions to develop a coordinated and strategic approach to supporting early career researchers. CIRCLE has been allocated GBP 4.85 million over 5 years (2014-2018), and is managed by the ACU and the African Academy of Sciences (AAS).Alongside the fellowships, an institutional strengthening program (ISP) will be led by Vitae to strengthen capacity of the institutions involved in the program to provide support for early career researchers. The position of researchers and their institutions within global academia will be further strengthened through guidance from the Quality Support Component (QSC), a consortium of internationally renowned institutions, led by the Natural Resources Institute at the University of Greenwich, UK. The consortium will advise on developing and disseminating the research that contributes to international discourse in the field. Center for Environmental Science, College of Natural and Computational Sciences of Addis Ababa University is collaborating with the consortium and working closely with assigned CVFs' to our Center. The aim of the program is to strengthen African research output

within the broad field of climate change. CIRCLE will seek to facilitate the capacity of African researchers to develop relevant local solutions, improve uptake, and use in local, national and regional policy and implementation. It will also enhance the output of African researchers by increased training and publications. The program seeks to support the emergence of centers of academic expertise in climate impacts. CIRCLE will concentrate fellowships on a select pool of African home and host institutions and complement them with institutional support. Therefore, it will directly enhance knowledge through the research Fellowships, while also providing critical support for institutions to capitalize on the skills and knowledge gained by their returning fellows. The African institutions will also receive quality assurance support on research career training from reputable advanced research institutions outside Africa. The program is a focus on supporting early career academics. On their own, the Fellowships will have important but limited benefits. By concurrently strengthening the capacity of institutions to manage, organize and support the career development of 'next generation' researchers, it is intended that fellows will return to a more enabling and sustainable environment for further research. This focus acknowledges the importance of nurturing early career academics and linking them to the long-term future development of university research, while also offsetting some of the common disadvantages they face in obtaining funding and time for scientific enquiry. Fellowships will be considered for discrete or collaborative pieces of research. It is expected that the research findings will be published in a peer reviewed journal at the end of the fellowship. The program will select a pool of African Institutions to nominate candidates. The nominees will then be required to submit a more detailed research proposal (guided and assisted by more senior academics at their home and host institutions).

Partners: African Academy of Sciences, Association of Common Wealth Universities, Many Sub-Saharan universities

Supported by: DFID and coordinated by African Academy of Sciences

Project period: 2015-2017

Total budget: 5.5 million ETB

Department of Mathematics

Project title: *Capacity Building in Research and Graduate Training in Mathematics in Ethiopia*
Project leader: Dr. Tilahun Abebaw
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ortilahunabebaw@yahoo.com
Phone: 0911063510

Project description: The major objective of the project isto increase the contribution of research and postgraduate education in Mathematical Sciences both at the national level as well as at the global level by building the capacity of the Department of Mathematics, Addis Ababa University, Ethiopia, through Research and Graduate Training.

Supported by: International Science Program of Sweden (ISP)
Project period: 2014-2017
Total budget: 1.7 million ETB per year

Department of Microbial, Cellular and Molecular Biology

Project title: *Mass Multiplication and Production of Bio-formulated Product of Indigenous Trichoderma species through Fermentation Technologies for the Control of Coffee Wilt Disease (Fusarium xylarioides) in Ethiopia.*

Project leader: Dr. Tesfaye Alemu

Email: tesfayealemu932@gmail.com or tesfaye.alemu@aau.edu.et

Phone: 0911 40 70 94 or 0913 766226

Project description: The most limiting factors for coffee production in Central and East African countries is *tracheomycosis* or vascular wilt disease of coffee caused by *Fusarium xylarioides* Steyaert imperfect stage (*Gibberella xylarioides* Heim and Saccas Perfect stage). The incidence of Coffee Wilt Disease (CWD) in Ethiopia is reported to be 60%, with significant yield losses due to very severe damage and ultimate death of millions of coffee trees. Due to the high cost of pesticides, the emergence of fungicide resistant to pathogen biotopes and other social and health related impacts of convectional agriculture on the environment have increased interest in agricultural sustainability and biodiversity conservation. Thus, there is a need for practical or sustainable solutions to plant disease problems that could provide effective control while minimizing cost and negative consequences for human health and the environment. In order to overcome these problems, more recently commercial formulations of biological control agents have been developed which have consistently given good control of some plant pathogens. For this purpose, this project proposal has been initiated and designed to control coffee wilt disease

(*Fusarium xylarioides*) through the development and production of bioformulated products from indigenous *Trichoderma* isolates under small and large-scale fermentation technologies.

Partners: Ethiopian Agricultural Research Institute, Jimma Agricultural Research Center

Supported by: Ministry of Science and Technology, Biotechnology Product Development Grant

Project period: 2016-2018

Total budget: 4,800,500.00 ETB

Department of Physics

Project Title: *Synthetic and Device Characterization of Organic Semi-Conductors*

Project Leader: Dr. Mulugeta Bekele
Email: malefya@yahoo.com

Project description: The research activity of the group is mostly computer modelling and simulations on different fields, including energetics of micron- and nano-sized devices such as Brownian engines and molecular motors, charge and energy transfer dynamics in organic polymer molecular systems and soft matter physics. Specifically, the group is aimed at doing research (experimental and theoretical) on the electrical and optical properties of the conjugated organic polymers in general and those produced in the synthesis lab by the group in chemistry in particular. The activities include mainly theoretical simulations but the group is working for establishing an experimental laboratory of the characterization of organic conjugated polymers and related devices. The group is strongly engaged in training students at the MSc and PhD level to enhance human resource capacity in the country with the aim to provide a new generation of teachers in the higher institutions capable to carry out intensive and sustainable basic and applied researches on modeling, simulation, and device characterization.

Partners: Uppsala University, Sweden and the International Center for Theoretical Physics (ICTP), Trieste, Italy

Supported by: International Science Program (ISP), Sida/Sweden

Project Period: 2015-2017

Total budget: 2,331,603 ETB

Department of Plant Biology and Biodiversity Management

Project title: *Production of Enset Bacterial Wilt Disease Control Formulations through Bio-Intensive Integrated Techniques: The Use of Trichoderma spp. and Seed Extract Residues as Biocontrol Agents*

Project leader: Professor Masresha Fetene

Email:masresha.fetene@qqu.edu.et or masreha.fetene@eas-et.org

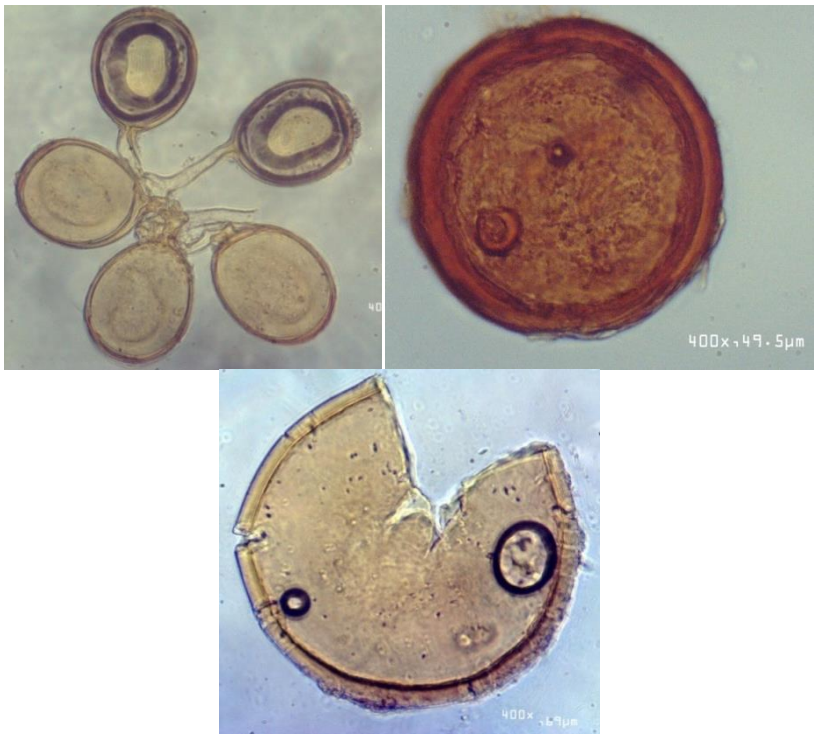
Phone: 0935 98 76 41

Project description: *Ensete ventricosum* (Welw. Cheesman) is a multipurpose crop widely cultivated in the South and Southwestern parts of Ethiopia supporting the lives of approximately 20 million people. In spite of its importance, *enset* cultivation is impeded by a disease commonly called *Xanthomonas* wilt or *enset* bacterial wilt caused by *Xanthomonas campestris pv. musacearum.* Previous research results revealed the occurrence of *enset* bacterial wilt disease in all zones of the Southern Nations, Nationalities and Peoples Region (SNNPR) with differing degrees of severity. Unlike other diseases, *enset* bacterial wilt is both extreme and rapid causing gradual increasing losses over years. Its economic impact is due to the death of the mother plant that would otherwise contribute to the continuation of *enset* production cycles. Regardless of their side effect, surface application of chemicals has little or no use to control the disease due to its systemic nature. Therefore, searching for alternative disease controlling techniques that are

effective, eco-friendly, long lasting, low-cost, and easy to prepare have paramount importance. One such type of technique is Bio-intensive Integrated Pest Management (BIPM). The technique incorporates ecological and economic factors into agricultural systems and decision-making, and addresses public concerns about environmental quality and food safety. BIPM is a recent trend to reduce the pesticide pressure and to enhance the farmers' interest to fetch higher remuneration for their produce. It relies on a range of preventive tactics and biological controls as curative methods to keep pest populations within acceptable limits. Biological controls are living entities that are used to control plant pests. Currently, various types of organisms, natural products and organic industrial byproducts are widely used as biological control agents. To mention some are plant secondary metabolites when extracted called botanicals, *arbuscular mycorrhizal* and *Trichoderma* fungi and *Brassica carinata* seed residues. The use of these biocontrol agents is safer to the user and the environment fulfilling criteria of sustainable agriculture. Therefore, this research project is initiated to study and evaluate the effect of bio-formulated products of medicinal plant extracts (botanicals), seed extract residues, arbuscular mycorrhizal and *Trichoderma* fungi species as biocontrol agents to manage *enset* bacterial wilt in the Southwestern parts of Ethiopia.

Medicinal plant sample collection (Gurage zone)

Processing of medicinal plant leaf samples



Drying, grinding, sieving and extraction Arbuscular mycorhizal fungi isolated from *enset* rhizosphere

Partners: Bahir Dar University, Ambo University, Ethiopian Spice Extraction Factory, Addis Ababa

Supported by: Ministry of Science and Technology of Ethiopia

Project period: 2015 – 2018

Total budget: 3 000 000.00 ETB

Project title: *Regional Capacity Building for Sustainable Natural Resource Management and Agricultural Productivity under Changing Climate (CAPSNAC)*

Project leader: Professor Zemede Asfaw

Email: zemede.asfaw@aau.edu.et

Phone: 0911 95 99 03

Project description: CAPSNAC is a NORAD/NORHED-supported project. It is working on the links between improved livelihoods and reduced pressure on natural resources to create a basis for long-term sustainable development in three Eastern African countries (Uganda, Ethiopia and South Sudan) collaborating with a Norwegian University. The Norwegian government supports these universities because it believes that education is a key prerequisite for economic growth. The project endeavors to address eventually key national, regional and global targets in agricultural productivity and poverty reduction; sustainable natural resource management; climate change adaptation and mitigation. Environmental stewardship and sustainability, research capacity and extension, and accelerated national development are main targets. The strategic roles of higher learning institutions are considered the means for generation of solutions to development challenges through provision of knowledgeable and multi-skilled graduates. Evidence-based options are targeted in formulation of interventions and policies for national development. Capacity building remains to be critical for universities to play their level best and the project has included work packages that enable them to provide innovative learning-teaching, research and outreach services and have positive impacts on the national development agenda in each country. The project is

structured under three thematic areas and six work packages. Wenchi District, located in Southwest Shewa Administrative Zone of Oromia Region, has been identified as a suitable area for base line survey, PhD and postdoctoral research Wenchi landscape – study area baseline survey, two PhD Dissertations and one Post-doc research

Partners: Makerere University-Uganda, Norwegian University of Life Sciences-Norway; Addis Ababa University-Ethiopia; (4). University of Juba-South Sudan

Supported by: NORAD/NORHEAD (Norway)

Project period: 2013- -2018

Total budget: 17,999,998.00 NOK; Budget for AAU: 2,619,025.00 NOK or about 15,000,000 ETB

Department of Zoological Sciences

Project title: *Conserving the Fishes of Lake Tana and Abay Basin through the Study of the Fish Stock, Enhancing Alternative Fisheries, and Popularizing the Threats*

Project leader: Professor Abebe Getahun
Email: abebeg@bio.aau.edu.et or abebe12002@yahoo.com
Phone: 0118959217 or 0911119656

Project description: The *Labeobarbus* spp. of Lake Tana, Ethiopia, are the only remaining cyprinid species flock in the world. They are also economically very important supporting more than 30% of the Lake Tana fishery. There are 17 species of this genus restricted to Lake Tana and its feeder rivers. One species is registered as "Endangered" and four other species as "Vulnerable". The remaining five are “Data Deficient” and seven are of “Least Concern”. Moreover, the situation for all the fish stock in Lake Tana is not conducive, given the growing anthropogenic activities (damming, irrigation, etc) around the lake. Hence, conservation problems and the degree of threat to Lake Tana fish stocks and, especially, the fish species of *Labeobarbus* are very much alarming. The major threats include over-exploitation of the fish resources; habitat disturbance; water pollution; water abstraction and impoundment; lack of institutional capacity and linkage; lack of basic scientific studies as well as lack of awareness on the importance and status of the fish spp. The Abay Basin is also being subjected to development activities including the construction of the "Great Renaissance Dam" at its lower course. It is appropriate, thus, to document the aquatic biodiversity and foresee the potential threats and suggest mitigation measures before it is too late. Therefore, this project aims at completing the gaps in scientific studies and reducing some of the above

conservation problems through proper interventions and extend that, in the next phase, to developing co-management and alternative livelihood trainings and practices in collaboration with a network of NGOs and community based organizations.

Partners: *Bahir Dar Fisheries*and Other Aquatic Life*Research Center*

Supported by: Critical Ecosystems Partnership Fund (CEPF)

Project period: 2014—2017

Total budget: 3,749,984.00 ETB

Project title: *Expanding Aquaponics Technology for Production of Fish and Vegetables in the Semi-Pastoralist Area of Metehara, Eastern Ethiopia*

Project leader: Professor Abebe Getahun

Email: abebeg@bio.aau.edu.et or abebe12002@yahoo.com

Phone: 0118959217 or 0911119656

Project description: Aquaponics is a combination of two technologies; growing fish (aquaculture) and growing vegetables (hydroponics) in a recirculating system. This technology is very much appropriate for areas where there is shortage of water and land. Such alternative technologies and diversification of food production methods are critical in a country like Ethiopia where the population is steadfastly growing and there is rampant poverty and acute shortage of protein and vitamin sources. With support from FAO SmartFish project, the Department of Zoological Sciences has established three demonstration sites and offered training on aquaponics to some 50 farmers. The experience has proven that the system can work in Ethiopia and can be extended to other regions of the country and elsewhere in Africa, especially in areas with high temperature and adequacy of water and land is questionable. Now it is intended to extend that experience to Semi-pastoralists of the Metehara Region (the "Kereyus") in Eastern Ethiopia. The Kereyu are among several traditional pastoralist groups living in the Upper Awash Valley within the Great Rift Valley in Ethiopia. The area is very appropriate for the growth of Nile tilapia and vegetables. The agro-pastoralists living around that area have prior experience of capture fisheries (from Lake Beseka) and also are growing some vegetables. This project will enable 30 agro-pastoralists to be trained in the use and management of the aquaponics system so that they could produce

adequate fish and vegetables, diversify sources of their income, and improve their livelihoods. The 30 agro-pastoralists will receive their own aquaponics units at the end of the project. A well-organized and furnished aquaponics center with hatchery and seedling facilities will be established to train farmers/ anglers from Ethiopia and the surrounding countries.

Figure showing aquaponics site at Metehara town, left and in demonstration greenhouse at AAU, right.

Partners: Fish-for-All, a non-governmental organization in Ethiopia and Metehara town administration in Eastern Ethiopia.

Supported by: Intergovernmental Authority for Development (IGAD), Djibouti

Project period: 2014—2017

Total budget: 3,875,000.00 ETB

Project title: *Training on Aquaponics Practices for Production of Climate Resilient and Organically Acceptable Fish and Vegetable Products*.

Project leader: Professor Abebe Getahun

Email: abebeg@bio.aau.edu.et or abebe12002@yahoo.com

Phone: 0118959217 or 0911119656

Project description: We have infrastructures (laboratories and field sites) of aquaponics and aquaculture within the campus of Addis Ababa University. The trainees will take theoretical classes consisting of the basics of aquaponics and aquaculture (cage and pond culture) systems and the organisms that will be involved as well as practical lessons at the facilities at the Addis Ababa University. The theoretical training may take some two months and the practical training will take one month. The trainees will be working on the facilities and they will take assignments in which they will be participating in presenting review works as well as practical projects.

Figure showing aquaponics in demonstration greenhouse at AAU

Partners: Fish-for-All, an NGO in Ethiopia and Metehara Town administration.

Supported by: Intergovernmental Authority for Development (IGAD), Djibouti

Project period: 2014—2017

Total budget: 322,500 ETB

Project title: *Niche Shift Investigation of Chilopertellus (Swinhoe) (Lepidoptera: Crambidae), Its Hosts and Natural Enemies: A Roadmap to Its Integrated Management at New Niches*

Project leader: Professor Emana Getu

Email:egetudegaga@yahoo.com

Telephone: +251(0)911019166

Project description: Maize and sorghum are the most important food security crops for sub-Saharan Africa in general and Ethiopia in particular. They are the 2nd and 3rd important crops for Ethiopia only surpassed by *teff*. The two crops are for long period of time the priority crops of Ethiopia which get attention of the government mainly to insure food security. The crops have tremendous plasticity as their yield can be outrageously improved through technology application, which improve them either genetically or agronomically. However, *Chilopartellus* is highly limiting the production of these two crops leading to 20-40% yield losses unless it is intervened mainly by insecticides. The pest used to be problematic in the lowland below 1500 meters above level, but recently expanded its niche to the highland above 2300 meters above sea level. In the lowland, the pest is kept in check by natural enemies and the wild hosts. However, the pest has natural enemies in the new niche or not was not known. The presence of wild hosts of the pest in the new niche as well is not known. If the pest is without natural enemies and wild hosts, there is a possibility that the pest become more devastating in the new niche unless there is another natural control mechanisms there. Hence, the current project will analyze the status of *C. partellus*, natural enemies and wild hosts of the pest in new niche which could serve as baseline information for designing integrated management of *C.*

partellus in a new niche which ultimately contribute to the food security strategy of the government.

Partners: Fish-for-All: an Ethiopian NGO and Metehara Town Administration

Supported by: Intergovernmental Authority for Development (IGAD), Djibouti

Project period: 2014—2017

Total budget: 322,500.00 ETB

Project title: *Novel Intervention Strategy against Malaria Mosquitoes: Development of an Odor-based Trapping System for Gravid Mosquitoes*

Project leader: Dr. Habte Tekie

Email: habte_tm@yahoo.com

Telephone: 0911407319

Project description: The use of insecticides and drugs against mosquitoes and the diseases they vector, continue to form the mainstays of malaria control programs. However, growing insecticides and drug resistant mosquitoes threaten the long-term success and sustainability of this approach. New complementary approaches to malaria control must be explored. Our development of synthetic attractant odor blends for gravid malaria mosquitoes provides the novel breakthrough needed for the long sought-after creation of a mass trapping system for malaria control. By luring gravid *Anopheles* mosquitoes to traps in number that are high enough to suppress population size and reduce biting intensity, a decline in malaria transmission could be realized. The objective of this project is to develop a 'super-blend' that attracts gravid malaria mosquitoes in semi-field and field conditions, and to optimize the positioning of gravid traps within the landscape, with the aim to demonstrate proof of principle for the reduction of malaria under epidemiologically relevant conditions.

Partners: Swedish University of Agricultural Sciences (SLU)

Supported by: Sida's program for Development Research (U-Forsk), Sweden

Project period: 2015 - 2019

Total budget: 1,062,041 ETB

Project title: *Aquatic Ecosystems and Environmental Management MSc Program*

Project leader: Dr. Tadesse Fetahi

Email: tfetahi@gmail.com

Telephone: 0961343601

Project description: Freshwater provides a unique habitat to biodiversity and plays an economical role via fishery production, irrigated-agriculture and tourism, and most importantly it provides drinking water to the local inhabitants. These water bodies are projected to be inadequate to meet the needs of one-third of the world's population by 2025, unless better use is made of this precious resource. The first task for wise-use and protecting our natural resources as well as for optimum resource utilization should be education and producing graduates who can understand the finite resources, are able to create awareness and are capable of teaching and conducting problem-based and solution-oriented research. To this end, Department of Zoological Sciences has solicited partnerships with Bahir Dar University, National Fisheries and other Aquatic Life Research Center (NFALRC) based at Sebeta of the Ethiopian Institute Agricultural Research (EIAR), and BOKU University from Austria and has created a joint MSc program entitled "Aquatic Ecosystems and Environmental Management (AEEM)". This joint MSc Program is designed to be run and implemented by AAU and BDU in collaboration with EIAR-NFALRC, through bringing knowledge, skills and facilities from various Ethiopian institutions together in order to meet the demands of developing a skilled task force which is capable of solving high-level problems, public education and awareness creation in aquatic ecosystems and environmental management. Such joint MSc program within Ethiopia is unique for the country. The overall goal of the project is to foster the sustainable management

of aquatic ecosystems and their resources in order to improve livelihoods in Ethiopia. At least 20 young water/environmental professionals from Ethiopia are attending this MSc program. The laboratory/field-research equipment and aquatic libraries of Addis Ababa University, Bahir Dar University and EIAR-NFALRC are updated to implement a skill-oriented MSc program and to enhance the research capacity of the Ethiopian institutions: the program is practical oriented. Training, academic quality assurance and curriculum development workshops have been organized for academic and administrative personnel of AAU, BDU and EIAR-NFALRC. The project is supporting capacity development processes at Eastern African institutions, which are educating professionals and carrying-out relevant research in Eastern Africa. The target institutions are key-players to mobilize society and financial resources to improve the management of environmental assets to the benefit of Eastern African people and Ethiopian in particular.

Students on field trip, collecting on site data and analyzing samples in the laboratory



Partners: Bahir Dar University, EIAR-NFALRC and BOKU University, Austria
Supported by: Austrian Development Cooperation, Austria
Project period: 2013-2018
Total budget: 11,300,000 ETB

SCHOOL OF INFORMATION SCIENCES

Department of Computer Science

Project title: *A Platform for Indigenous and Scientific Knowledge Sharing in the Pastoralist and Semi Nomadic Community at Borena Zone*

Project leader: Dr. Getachew Hailemariam

Email: getachew.hailemariam@aau.edu.et

Telephone: 0911784044

Project description: This study is planned to be conducted to partly mitigate the economic and social challenges in Borena Zone, Oromiya regional state. The communities in this zone are mainly pastoralists practicing traditional cattle rearing and small-scale farming. The area is remote with low transport access. As a result, the community in the zone is less opportune for adoption of contextualized modern agricultural and livestock production mechanisms. Due to lack of exposure, the communities tend to be resistant to adoption of new and modern life styles unless rooted in the context. This happens due to their culture, low level of knowledge, lack of life skill sets to initiate and support better and innovative life style. Mainly, access to real time market information is the most critical problem that deters them from earning reasonable income from their cattle sales. Instead, intermediary traders get the lion share of the benefits. This study intends to explore a mechanism whereby the community gets access to relevant, timely, and usable information through the use of pervasive communication devices such as mobile phones. The study builds on the lesson learned from the 8028 project by launched by Agricultural Transformation Agency (ATA) and strives to create a platform that address the specific needs of the community in the zone.

Partners: Ministry of Communications and Information Technology (MCIT), Addis Ababa

Supported by: MCIT, Addis Ababa;

Project period: 2017-2018; **Total budget:** 195,000 ETB

Project title: *Development of Optical Character Recognition System for Ethiopic Documents*

Project leader: Dr. Yaregal Assabie

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Phone: 0910914601

Project description: Optical Character Recognition (OCR) is an area of research and development where a system is made to recognize document images. Cultural considerations and enormous flood of documents motivated the development of OCR across the world. Unlike other scripts, OCR development for Ethiopic characters has not shown the level of usable commercial product. This research and development work is aimed at developing a usable full-fledged OCR system that recognizes Ethiopic characters independent of font size, style and type.

Supported by: Ministry of Science and Technology, Addis Ababa

Project period: 2014-2016

Total budget (ETB): 184,000 ETB

Project title: *Development of Amharic Morphological Analyzer using a Hybrid Approach*

Project leader: Dr. Yaregal Assabie

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Project description: Morphological analysis is an essential component in many natural language processing (NLP) applications. The importance of morphological analysis is more crucial in morphologically complex languages like Amharic. Amharic NLP applications such as search engine, spell checker, dictionary, grammar checker, part-of-speech tagger, parser, machine translation involving Amharic language (e.g Amharic-English, Amharic-Oromiffa, Amharic-Tigrigna, etc.), semantic analyzer, question answering system, text summarizer, etc. require Amharic morphological analyzer as an indispensable component. More recently, there have been few attempts on the development of Amharic morphological analyzer. However, a complete Amharic morphological analyzer with the capability of analyzing all Amharic words was not developed to date. As a result, it has become difficult to develop efficient high-level Amharic NLP applications. This research and development work is aimed at developing a full-fledged Amharic morphological analyzer that would serve as a key component in the development of Amharic NLP applications.

Supported by: Ministry of Communication and Information Technology, Addis Ababa

Project period: 2014-2017

Total budget: 98,000 ETB

Project title: *Development of Ethiopian License Plate Recognition System*

Project leader: D. Yaregal Assabie

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Project description: With the ever-increasing auto population, the transportation system has been struggling to serve users efficiently. In order to solve this problem, many countries in the world still depend on building more and more road infrastructures to reduce traffic stress. However, for various reasons this solution is still not capable enough to solve the existing problem. As a result, various Intelligent Transportation Systems (ITSs) emerge as viable solutions to the problem of managing vehicles. ITSs apply technologies of information processing and communication on transport infrastructures to improve the transportation outcome. In these days, numerous intelligent transportation systems are being used in various applications. One of these systems is License Plate Recognition (LPR). LPR system is a mass surveillance system that automatically captures images and/or videos of vehicles and recognizes their license numbers in a natural setting. The main objective of LPR systems is to detect and recognize license plates of vehicles from their images, and present the identified information about the plate in a way that further applications can understand it. The objective of this study is to develop an Ethiopian LPR system that is able to detect and recognize Ethiopian license plates in real time

Partners: Information Network Security Agency (INSA), Addis Ababa

Supported by: Ministry of Communication and Information Technology, Addis Ababa

Project period: 2016-2019

Total budget: 3,504,530 ETB

Project title: *Development of Amharic Spelling Checker*

Project leader: Dr. Yaregal Assabie

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Phone: 0910914601 (Cell)

Project description: Amharic is the working language of the federal government and several states of Ethiopia. Accordingly, various offices, organizations and individuals produce huge amounts of Amharic documents. Due to the morphological complexity of the language, however, there is no spelling checker developed for Amharic language. In this project, we will develop an Amharic spelling checker that automatically checks if each word in an Amharic document is written correctly by analyzing the morphology of words. The program will be developed as a plug-in for word processing applications such as Microsoft Word. When the plug-in is enabled (with a single click) it will start checking the spelling of each word and flags misspelled words.

Supported by: Ministry of Communication and Information Technology

Project period: 2017-2018

Total budget: 500,000 ETB

ADDIS ABABA INSTITUTE OF TECHNOLOGY

Project title: *African Railway Education and Research Institute (ARERI)*
Project leader: Dr. Birhanu Beshah
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Phone: 0913 76 75 02

Project description: Great plan of railway construction and rehabilitation of infrastructures are actively executed in Eastern African countries, including Ethiopia, Kenya, Uganda, Djibouti and others. As one of the top priority national projects, Ethiopia alone has an ambitious plan of constructing more than 5000Km railways, including 736Km Addis Ababa-Djibouti line which will be completed in few months and the Addis Ababa light railway lines which started operation in September, 2015. In fact, East African Railway Master Plan has allocated 29 billion USD for repair works and construction of new lines, causing huge demand of railway engineers to design, construct, monitor and operate railway systems.

Having huge railway transportation system expansion in terms of both new lines construction and renovation of the old lines in Eastern and Southern Africa, the need for advanced study in the fields of railway system education and research is found fundamental. Hence, under the support of WBG, Addis Ababa University/Addis Ababa Institute of Technology has designed and developed African Railway Education and Research Institute (ARERI) to train African students in railway disciplines. ARERI is basically responsible for creating skilled manpower in railway fields by establishing a well-organized education and research institute under the foundation of already existing Railway Engineering Center established in collaboration with Ethiopian

Railway Corporation. It has produced over 300 MS graduates including some Djibouti graduates in the field of railway Civil Engineering, Rolling Stock Engineering and Electrical Engineering for Railway System.

The four major areas for M.Sc. study are Rolling Stock Engineering, Electrical Engineering for Railway Systems, Railway Civil Engineering and the newly designed Railway Systems Management. On the foundation of already developed PhD programs, ARERI is looking forward to design a full-fledged railway PhD program for the successful implementation of the program. In addition, short-term trainings will be designed and participants from regional and national partners, private sectors and policy makers are expected to take part.

For successful implementation of the proposal, ARERI will work in cooperation with national, regional and international partners. National and regional partners will participate on short-term training and course delivery. International partners, on the other hand, will engage on course delivery and research works. Ethiopian Railways Corporation, as one of the major partners from the private sectors, will help the center to engage on real scenario research and students will have easy access for industrial internship where they will find out bottlenecks. Private sectors in the region working on the railway transportation system are also potential candidates for professional internship of the institute's students.

After 5 years, ARERI aims to train annually 5 PhDs, 50 MScs, and 20 short-term training graduates, of which more than 20 % will be from regional countries. Out of degree thesis, ARERI will also publish 10 technical papers annually. The teaching-learning process will be supplemented with professional

visits, academic internships, professional workshops/conferences to incorporate excellent practices into the program, which will continuously assessed and evaluated against the designed goals and objectives.

Partners: African universities, a South Korean University and EU universities

Supported by: The World Bank

Project period: 2017-2021

Total budget: 138,000,000 ETB

Project title: *Design and Implementation of ICT-based Agricultural Knowledge Management System (AKMS) to Foster Development in Rural Ethiopia.*

Project leader: Dr. -Eng. Dereje Hailemariam

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Project description: The emergence and rapid evolution of Information and Communication Technologies (ICT) in the last few decades have opened new avenues in knowledge management that could play important roles in meeting the prevailing challenges related to sharing, exchanging and disseminating knowledge. ICT can enable individuals, communities and institutions to generate, access, share, adapt and apply larger volume of information at an enhanced rate and at reduced costs. It is also a potential means to empower communities, facilitate awareness creation and increase people's participation in development processes. In the agricultural sector, ICT plays a significant role in technology generation, assessment, refinement and dissemination for the sector's transformation. It empowers the resource-poor farmers with up to date knowledge and information about agricultural technologies, best practices, markets, price trends, consumer preferences, and sources of finance, weather forecasts and the environmental protection.

The main goal of this project is designing and implementing ICT-based agricultural knowledge management systems (AKMS) to provide timely and updated agricultural information to smallholder farmers and improve information access and reachability for the rural community.

Partners: School of Computing and Electrical Engineering of Bahir Dar institute of Technology and Ministry of Science and Technology.

Supported by: Ministry of Science and Technology (MoST)

Project period: 2015 – 2018; **Total budget:** 3,500,000 ETB

Project title: *Enhancing education and research in networking and communications engineering (ENhHANCE)*

Project leader: Dr. Eng. Dereje Hailemariam

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Phone: 0920662176

Project description: The effective use of information and communication technologies (ICTs) in both the private and the public sector can significantly contribute to and accelerate progress in private sector development, as well as, overall advancing socioeconomic development. Therefore, it is imperative that the businesses, Governments and their developm ental partners adopt a holistic and comprehensive approach to better leverage the benefits of ICT in both the public and private sectors. To that end, a key national strategic objective is the strengthening of local capacity in ICT research, education and innovation, as well as, strengthening the linkages between those three cornerstones of the so-called "knowledge triangle".

The project on Enhancing Education and Research in Networking and Communications Engineering (ENhANCE) addresses the aforementioned objective through a partnership between Department of Electrical and Computer Engineering (ECED), Addis Ababa Institute of Technology (AAiT), Addis Ababa University, Ethiopia and two other international partners from Europe and Africa. The ECED-AAiT is among the premier units for ICT research and education in Ethiopia and it has well defined strategies that are closely aligned to the nation strategic goals for development and transformation into knowledge societies. Ethiopia has a critical need for more well-trained, highly-skilled and innovative graduates in ICT disciplines, such as, networking

and communications engineering. Moreover, in there is also a demand for high-quality ICT research conducted in the institution to address the nation ICT challenges and priorities, and also provide a boost its economies through commercialization of their research and cooperation with industry.

However, ECED-AAiT is facing significant challenges in implementation their institutional and national vision. The notable challenges include:

-Outdated curricula for networking and communications engineering (at Master's and Doctoral-level), which has not effectively kept up with the rapid technological developments in the areas and has not included innovative engineering pedagogical methods;

-Shortage of qualified and skilled staff members to conduct research, educate and effectively supervise thesis research work;

-Lack of appropriate research and teaching laboratory facilities, which could improve student-centered learning and enable high-quality research by both staff and students.

The ENhHANCE project proposes enhancements for ECED-AAiT in engineering education, research capacity and industry outreach through collaborative activities with its international partners. The European partner Aalto University is a long-established and leading unit for research and education in Finland in the area of networking and communications engineering, and plans to leverage that extensive knowledge and experience for the benefit of the ECED-AAiT. The overall objective of the ENhANCE project is to implement specific interventions for enhanced postgraduate education and research capacity within ECED-AAiT, in the area of communications and networking, so as to better meet needs of the local economy and society. To that end, the ENhANCE project proposes a number of activities that will enhance

existing or newly created study programs in the area of communications and networks, and strengthen the research environment and industry outreach programs, for ECED-AAiT.

Partners: Department of Communications and Networking (COMNET), School of Electrical Engineering, Aalto University, Finland, College of Information and Communication Technologies (CoICT), University of Dar es Salaam (UDSM), Tanzania

Supported by: Higher Education Institutions Institutional Cooperation Instrument (HEI ICI) of Ministry of Foreign Affairs of Finland

Project period: 2013 –2015

Total budget: 12,000,000 ETB

Project Title: *Capacity Building Project for the Ethiopian Center of Excellence in Freight Transport and Logistics (NICHE-ETH-285).*

Project leader: Dr. Bekila Teklu

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Project description: This project is designed to build capacity for the freight transport and logistics sector of the country. By doing so, it is planned to develop and implement interdisciplinary gender-sensitive education and training in freight transport and logistics. In due course of the project then delivery of logistics and freight transport professionals and practitioners with competences and skills assured in line with the demand of the labor market. The requesting organization will be the center of excellence and capacity building for the freight transport and logistics sector in the country that carries out and delivers the state-of-the-art research outcomes geared towards preventing and solving problems and identifying new trends in the sector.

Partner: CINOP Global
Supported by: The Netherlands initiative for Capacity development in Higher Education (NICHE) Grant (Nuffic), The Netherlands
Project period: 2017- 2021
Total budget: 28,000,000 ETB

Project title: *Teaching and Research Capacity Building in Biomedical Engineering (CB-BME-AAU: NICHE/ETH/246)*

Project leader: Dr. Frehiwot Woldehanna

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Project description: The Center of Biomedical Engineering, Addis Ababa Institute of Technology, has been established in 2012 to support technical work force development required in the last health sector development programs as well as the current Health Sector Transformation Plan (HSTP).

This capacity building project aims at strengthening the Center through upgrading teaching and research, setting-up of core laboratories, and facilitating maintenance of labor market oriented gender sensitive curricula at both the undergraduate and postgraduate levels.

At the end of the project, the Center will have the organizational and academic capability to deliver professionals and applied research in biomedical engineering tailored to changing circumstances and in an innovative, market-oriented and gender-sensitive manner. The specific outputs are:

1. Revised, benchmarked, locally accredited (reference to the Ethiopian system), labor market oriented and gender sensitive BSc, MSc, and PhD in Biomedical Engineering;
2. Center of BME staff with gender balance trained in delivering the BSc, MSc, and PhD programs in Biomedical engineering with modern teaching methodologies;
3. Seven (7) staff of Center of BME upgraded to PhD level and Two (2) PGD level;

4. Increased research capacity and establishment of a PhD Program at Center of BME through collaborative projects;
5. Modernized labs for design, practical training, and maintenance and for providing services to the outside community and to cater for local production;
6. Promote entrepreneurship and in-country production of medical products and services;
7. Enhanced organizational and managerial processes, and governance;
8. Development and implementation of a gender and equal opportunities policy across the Center of BME.

Partners:

- University of Oulu, Finland
- Tampere University of Technology
- University of Cape Town
- Philips Health
- CINOP Global, BV (Project Coordinator)

Supported by: EP-Nuffic

Project period: 1 February 2015 – 31 January 2019

Total budget (ETB): EUR 1,179,536

Project title: *Technologies to Reduce Postharvest Losses of Ethiopian Fresh Fruits*

Project leader: Dr. Birhanu GebreSelassie and Dr. Bart Nicolai

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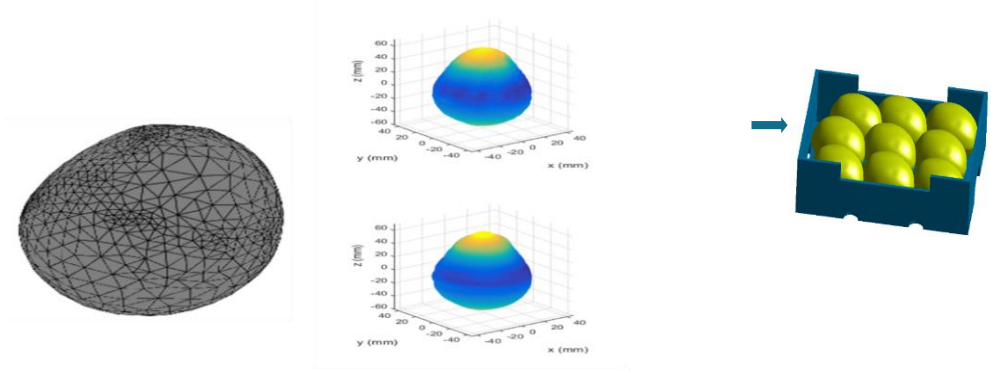
Phone: 0911238520

Project description: In developing countries such as Ethiopia from 15% to as high as 50% of fruit and vegetables are lost during post-harvest storage and handling. This contributes to higher food prices loses by removing part of the supply from the market. It also has an impact on environmental degradation and climate change as land, water, human labour and non-renewable resources are used to produce, process, handle and transport food that is eventually not consumed.

This project aims at reducing post-harvest losses of avocado and mango fruits in Ethiopia. This will be achieved through:

1. Capacity building, by training Ethiopian MSc and PhD students to become world-class experts in post harvest biology and technology and supply chain management, and develop laboratory and pilot storage facilities;
2. Extension and dissemination of the acquired knowledge to farmers, co-operatives and local companies; and
3. Reduce the waste of avocado and mango by 10% through appropriate postharvest technologies.



Partner: KU Leuven, Faculty of Bioscience Engineering, Department of Biosystems, MeBioS division, Belgium (www.kuleuven.be – www.mebios.be)

Supported by: VLIR-UOS (Belgian Development Cooperation)

Project period: 2014 -2019

Total budget: 6,987,000.00 ETB

Project title*: Development of a Clean Biotechnological Process and Pilot Plant for Bakery Yeast Production from Ethiopian Resources*

Project leader: Dr. Solomon Kiros

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Project description: This project aims at developing a clean biotechnological process for the production of bakery yeast from Ethiopian molasses. This is of major interest not only because the bakery industry is rapidly developing in Ethiopia, but also because country's demand for bakery yeast are mostly met through importation. Hence, there is a growing necessity for a local production and availability of bakery yeast. In addition, the main raw materials necessary to industrial yeast production are locally available in Ethiopia (wild yeast strains and molasses). In addition, the use of these raw materials even creates new opportunities for existing industries since molasses, for example, is a waste from the sugar production industry and would gain market value by being used as input product in the process of yeast production.

This project will be implemented within the Bioengineering Chair of the School of Chemical and Bio-engineering of the Addis Ababa Institute of technology (AAiT) where a team of experienced professionals will be implementing the following tasks:

Isolate, purify, identify and evaluate Ethiopian yeast strains in their performance, physiology and quality as bakery yeast. This step is decisive since the isolation of Ethiopian yeast strains may lead to the discovery of wild strains

with high potential for use in the bakery and beverage sector and could be comparable in their performance and quality to the genetically modified yeast.
Optimize the yeast production process using local strains and local molasses. This task is essential to obtain cost-effective bakery yeasts, from Ethiopian origins, presenting satisfactory performances. It first consists in assessing the locally produced molasses and improves their properties for bakery yeast production. Then the influence of different parameters (culture media, pH, temperature, etc.) on the yield and productivity of the fermentation process for yeast production will be investigated. Finally, the end-products will be separated, purified, evaluated and characterized and the yeast with best performances for the production of bread and other goods will be selected.
Implement scale up from lab scale to pilot plant of the biotransformation process and downstream processes (separation and purification) and optimize the batch biotransformation process as well as evaluate other alternative as fed batch and continuous production of bakery yeast.

This will hence lead to the production of bakery yeast from Ethiopian origins with improved performances for the production of baked goods as well as open door to beverage yeast production. The so-obtained optimized process will then have to be brought to an industrial scale in partnership with corporate stakeholders (Sugar Corporation, Bakery industry). Thus, the implementation of this project will allow for the production (in Ethiopia) and further distribution of bakery yeast obtained from Ethiopian sources. In addition, the project help to build new capacities in the domain of bio-industrial processing (in accordance with the Ethiopian GTP [Federal Government of Ethiopia, 2010]), specifically in the field of Biotechnology which has an enormous potential due to the tremendous Ethiopian biodiversity.

Supported by: Ethiopian Ministry of Science and Technology, Addis Ababa

Project period: 2015 - 2018

Total budget: 4, 400,000 ETB

Project title: *Appropriate and Low Cost Technology Selection for Used Oil Treatment Plant in Ethiopia*

Project leader: Dr. Eng. Abubeker Yimam

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Phone: 0911950214

Project description: Used lubricating oil has been the subject of much debate over recent years in Ethiopia. The amount of lubricating oils that is disposed annually in the country is considerably large. This large amount of waste lubricating oil has a significant impact on both economic and environmental aspects. Lubricating oils cost millions of dollars to manufacture and represent a high pollutant material when disposed of. If lubricating oils discharged into the land, water or even burnt as a low-grade fuel, this may cause serious pollution problems because they release toxic chemicals and other pollutants into the environment.

In light of the above, TOTAL Ethiopia has commissioned Addis Ababa Institute of Technology to execute a study ***on an appropriate and low cost technology selection for used oil treatment plant in Ethiopia.*** In this project, Characterization of used lubricating oil, namely TOTAL RUBIA TIR 7400 15W-40, TOTAL QUARTZ 5000 20W-50 40 and Testing of simple used oil recycling technologies (Acid-Clay and Solvent extraction) which utilize cheaper chemicals, utilities and equipment relative to other recycling or re-refining options have been investigated .

FiG-Used oil **Fig- treated oil**

Partner: TOTAL Ethiopia

Supported by: TOTAL Ethiopia

Project period: 2015-2017

Total budget: 1,071,500. ETB

Project Title: *Towards Designing of Developing Mobile-based Tourist Recommender System: A Hybrid Approach.*

Project leader: Dr. Tibebe Beshah

Email:

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Project description: The project is about study, design and development of a mobile-based tourist recommender system using hybrid approach.

Supported by: Ministry of Communication and IT, Addis Ababa

Project period: 2017-2018

Total budget: 108,500 ETB

Project title: *Bilingual Machine Translator for Amharic and Tigrigna (BMTAT)*

Project leader: Mr. Michael Melese

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Phone: 251-911 808894

Project description: This study aims to develop a bilingual statistical machine translation system for Amharic-Tigrigna that accept one of the languages (Amharic-Tigrigna) as an input and translate to a target land (Tigrigna /Amharic). For these, A bilingual Amharic-Tigrigna parallel text corpus will be cooperated to train and test the statistical machine translation system using GIZA++ , Moses, SRILM, Perl script and other text processing tools along with the purpose used for under the environment. Finally, the system would be tested for translated result using BLEU score more.

Supported by: Ministry of Communication and Information Technology, Addis Ababa

Project period: 2017 - 2018

Total budget: 99,500 ETB

Project title: *Electric Power and Control Engineering PhD Program*

Project leader: Dr. Mengesha Mamo

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Project description: As planned in the GTP, Ethiopia is forging ahead with the production of clean electric power from hydro-power, thermal energy, wind, solar and from organic wastes. This is now being expanded into building the big Renaissance Dam on the Nile River and smaller but a series of dams on the Gibe-Omo River. Currently, Ethiopia is producing excess clean energy that requires researched knowledge and capacity to efficiently manage a resource that will be sufficient to Ethiopia and also be exported to neighboring countries such as Djibouti, South Sudan and Kenya.

To ensure that the management of production and distribution of such clan energy is efficiently done, AAU is launching a PhD program in collaboration with two Swedish universities, namely Chalmers and KTH, and with one private company in Sweden, namely, ABB and of course with substantial support from the Ethiopian Electric Power Authority. The project will be financially supported by Sida/Sweden starting January 2018, running for consecutive four years.

Partners: Chalmers and KTH Universities and ABB, a private company, Sweden and the Ethiopian Electric Power Authority, Addis Ababa

Supported by: Sida/Sweden

Project period: 2018-2023

Total cost: 85,312,377 Birr

AKLILU LEMMA INSTITUTE OF PATHOBIOLOGY

Project Title: *Ethiopia Control of Bovine Tuberculosis Strategies (ETHCOBOTS)*

Project leader: Professor Gobena Ameni

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Phone: 0112 76 30 91 (Office) or 0911 41 30 73

Project description: The rapidly growing human population and the high rate of urbanization lead to increased milk demand in Ethiopia. Nonetheless, the milk produced by the predominantly raised zebu cattle could not satisfy the demand, and hence raising of crossbred dairy cattle with high milk production potential is the best alternative so that milk production goes pace with the population growth. To this effect, as crossbred dairy cattle are more susceptible to bovine tuberculosis, establishing control strategies for bovine tuberculosis are needed so that the impact of this disease to the dairy industry and public health is minimized. Therefore, the main objective of this study is to develop control strategies for bovine tuberculosis in Ethiopia.

Supported by: Biotechnology and Biological Sciences Research Council (BBSRC), UK

Project period: 2015- 2019

Total budget: 13,500,000 ETB

COLLEGE OF
BUSINESS AND ECONOMICS

Project title: *Ethiopian Electric Power (EEP) Functional Training Delivery Project*

Project Leaders: Matiwos Ensermu (PhD) and Dilnesahu Samuel

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Project description: The EEP Functional Training Delivery Project is launched between the Addis Ababa University School of Commerce (AAUSC) and the Ethiopian Electric Power (EEP) to offer 86 trainings to about 2,500 staff of EEP in a space a year as per the comprehensive training needs assessment conducted by the Addis Ababa University School of Commerce. Such assessment also resulted in bringing the Addis Ababa University Institute of Technology on board to deliver 89 trainings to EEP staff. While the Addis Ababa University Institute of Technology focuses on technical areas, the Addis Ababa University School of Commerce handles trainings in business functional areas for all staff of EEP including the top management.

AAUS owns this project as part of its community service and as a typical model of industry-academia linkage envisioned by the Growth and Transformation Plans of Ethiopia. To such end, the Project is managed with utmost care and focus through a full-fledged project-specific working manual. The project has passed through major milestones such as devising training plan, issuing yearly training schedule, screening trainers for all trainings, developing modules for 40% of trainings, and delivering 20% of trainings. The project involved about 174 staff of the AAUSC.

Supported by: Ethiopian Electric Power Authority

Project Period: 2016 - 2018

Total Budget: 7,442,263 ETB

Project Title: *Training for Public Employees on Automation of Public Service and Facilities (e-Procurement, Electronic Monitoring System, Computer Applications for Office Duties, Human Resources and Inventory Management)*

Project Leaders: Dr. Matiwos Ensermu and Mr. Girma Belete

Phone: 0922331795

Project description: This project aims to train more than 400 public servants to improve their efficiency in service delivery, develop skills of using resources efficiently by controlling procurement procedures and the maintenance and controlling of facilities and human resources during the course of service delivery. In short, the following summary services are planned to be delivered in the course of this project.

- To train federal government employees to utilize ICT to undertake their activity.
- To establish linkage with the industry for reviewing curricula, writing cases, and to make improvement on the overall teaching learning process

Supported by: Ministry of Communication and Information Technology (MCIT), Addis Ababa

Project period: 2017-2018

Project Cost: 2,598,720 Birr

Project title: *Commercial Bank of Ethiopia Nationwide Employment Examinations Administration*

Project Leaders: Dr. Matiwos Ensermu and Mr. Girma Belete

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Phone: 0922 33 17 95 (Cell)

Project description: This project compiles calibrated (verified with model tests) and specialized examinations for the purpose ofadministering nationwide employment exam for Commercial Bank of Ethiopia applicants at major cities of Ethiopia with a target number of trainee exceeding 23,000 individuals.

Supported by: The Commercial Bank of Ethiopia

Project period: 2017-2018

Project Cost: 2,532,975 ETB

Project Title: *Capacity Building for Ministry of Trade Employees*

Project Leaders: Dr.Matiwos Ensermu and

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Dr. Abdurezak Mohammed

Phone: 0922 33 17 95 (Cell)

Project description: This project is works towards providing specialized training fifteen employees of Ministry of Trade in MA-Marketing Management; and fifteen employees of Ministry of Trade in MA-Logistics and Supply Chain Management by developing a tested-modules and employing the same by expert staff members to enable the employees to deliver improved and quality oriented services to their customers.

Supported by: UNDP and Ministry of Trade, Addis Ababa

Project period: 2014-2018

Project cost: 3.500,000 ETB

Project Title: *Joint PhD Program between Addis Ababa University, Ethiopia and Tilburg University, The Netherlands (NICHE/ETH/20)*

Project Leaders: Dr. Matiwos Ensermu

Dr. Mulugeta GebreMedhin

Phone: +251911621330

Project description: This project is designed toTrain 100 PhD and 400 MA students in the field of Business in a joint program between Tilburg University, in The Netherlands, and AAU School of in collaboration with two national universities (see below).

Partners: Mekelle University and Arba Minch University

Supported by: NUFFIC, The Netherlands

Project period: 2011-2018

Project cost: 76,000,000 ETB

Project title: *Ethio-European International Business School (EEIBS)*

Project leader: Professor Tassew WoldeHanna
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Project coordinator: Dr. Mohammed Seid
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Project description: In August 2013, the Government of Ethiopia and the EU signed the Transformation Triggering Facility (TTF) project, € 35 million of the 10th EDF NIP, to finance some of the transformational elements of the GTP. The TTF focuses on strategic, triggering interventions to support the implementation of the GTP and in particular Ethiopia's economic transformation focusing on promotion of high value exports, import-substitution and expansion of tertiary education, research and innovation.

The TTF project has four main components:

1. Small and Medium Enterprises (SMEs) and markets' development;
2. Business skill enhancement and the fostering of innovation
3. Hubs' development; and
4. Capacity building and policy fine tuning

Component II will be managed by the College of Business and Economics (CoBE) at the Addis Ababa University. Two main results are expected to be achieved:

1. The Ethio-European International Business School (EEIBS) will be established to provide high quality and practically oriented MBAs and short executive courses tailored to the Ethiopian context;
2. The Ethio-European Business innovation Centre (EEBIC) will be established to allow selected SMEs to strengthen their innovative capacity will be established.

Supported by: The European Union (EU)

Project period: 2017-2020

Project cost: 351,000,000 ETB

Project title: *Management-Economics PhD Program*

Project Leaders: Dr. Workneh Kassa and Dr. Atlaw Alemu

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Email: atlawalemu@yahoo.com

Phone: 0911144974

Project description: The Management-Economics PhD Program has become a pivotal program in researching the status and future trends of the economic development of the country and the management of the same. It suffices to mention the titles of the three PhD graduates of the program.

1. Access to bank loans, income distribution and economic growth in agent-based modelling: Evidence from evolutionary perspective by Atnafu Gebremeskel, supervisors: Professor Almas Heshmati from JU and Assoc. Professor Tadele Ferede from AAU
2. Welfare implications of credit constraints and climate change adaptation strategies on Ethiopian farm households by Hailu Elias, supervisors: Professor Pär Sjölander and Assoc. Professor Kristofer Månsson from JU and Associate Professor Assefa Admasie from AAU
3. Industrialization of economies with low manufacturing base by Atlaw Alemu, supervisors Professor Borje Johansson, Professor Ghazi Shukur and Associate Professor Kristofer Manson, all from JU

It is these kinds of graduates that are armed with contemporary knowledge and the development trends who are added into the workforce of promoting the development of the country to lead it to join the middle-income countries by 2025 as indicated in the GTP.

Partner: Jönköping University, Sweden

Supported by: Sida/Sweden

Project period: 2018-2023; **Total budget:** 167,477,155 ETB

COLLEGE OF HUMANITIES AND LANGUAGE STUDIES

Project title: *Deaf blindness: theory and practice in the Ethiopian context*

Project leader: Mr. Andargachew Deneke

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Phone: 0911 66 27 90

Project description: In 2011 the University of Addis Ababa and Royal Dutch Kentalis have started a project in the area of deafblindness with the Ethiopian Sign Language and Deaf Culture Program Unit (department of Humanities) named as Deafblindness to deal with theory and practice in the Ethiopian context. The project contains several workshop, training at masters' level and support system for the affected.

In brief, the scope of project include:

1. Provision of training both theoretical and practical to various stakeholder groups in the area of Deaf blindness,
2. The establishment of a Resource Centre on Deaf blindness at the University,
3. development of materials, guides, tools and other services, and
4. Academic research on Deaf blindness.

Additional information, including full objectives and planned outcomes, can be found in the project concept, logical framework and budget. The fund for the program is from Royal Dutch Kentalis to carry the project through 2011 to 2013. However, for technical reasons it is still an on-going project, as the fund is not completely consumed within the planned project period.

Supported by: Kentalis International Foundation

Project period: 2011-2018

Project cost: 4,400,000 ETB

Project title: Linguistics Capacity Building: Tools for the Inclusive Development of Ethiopia

Project Leader: Dr. Ronny Meyer

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Phone:

Project Description: The project goal is that staff and graduate students at the linguistic departments at Addis Ababa University and Hawassa University will have competence and resources on how to best implement language resources and standardisation for marginalised, disadvantaged languages, including sign language, for the benefit of the Ethiopian society and people. Central documents both nationally in Ethiopia and internationally state that education in the mother tongue is essential for good learning and education, and thus for the development of the society.

The project will be addressing the need for well-qualified and professional language and cultural experts, researchers and academics who may contribute to the amelioration of the education in mother tongue. The project's aim is thus to provide the possibilities for children and adult speakers of the languages to use them in education and other democratic arenas that are important for the development of modern Ethiopia.

A language technology laboratory will be established at the Linguistics Department at Addis Ababa University. Corpus development of four written languages will be crucial for technology development inside and outside the project. For the spoken and signed languages, multimedia interface will be developed.

The project will also be working closely with local authorities and educators, and offer a number of workshops for educators and local authorities for signed and spoken languages.

Key goals and achievements

Overall goal

The overall goal of the project is to increase resources and opportunities for children and adult speakers of disadvantaged spoken and signed languages to use their mother tongue in Ethiopia.

The specific objectives of the project are

1. Increased capacity and competence at Addis Ababa University and Hawassa University in a. how the Ethiopian language is built up b. how to develop writing systems, dictionaries and grammars c. how to exploit language technology for disadvantaged languages
2. Strengthen capacity and competence among local educators and authorities in new knowledge on the disadvantaged spoken and signed languages obtained in the project

Partners: Hawassa University, Hawasa, Ethiopia

Supported by: NORAD, Norway

Project period: 2013-2018

Total Budget:50,750,000 ETB

Project Title: *Beyond Access: Improving Quality of Early Years Reading Instructions in Ethiopia and South Sudan) QZA 0483 ETH-16/0028)*

Project leader: Dr. Moges Yigezu

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Phone: 091140 54 20 (Cell)

Project description: The objective of the project is improving quality in education for primary grades in Ethiopian schools through heightening the capacity and competence of teachers and TTCs, and HEIs in Ethiopia and South Sudan in the area of early years reading instructions. Over the last two decades, the Ethiopian government has launched mother tongue education in local languages and to date there are twenty-eight languages introduced into the school system. The number of students attending primary education in local languages has reached 20.6 million in 2013/14 academic year (MOE, 2015), one-fourth of the total population. In terms of quality of education, however, there are serious concerns. As shown by various assessments conducted by the Ministry and its partners (EGRA 2010 Report), the majority of students remain illiterate after staying in school for two or three years. The current project aims to improve the quality of primary education by:

1. Capacitating TTCs and HEIs,
2. Facilitating the production of quality reading materials in eight mother tongue languages,
3. Producing evidence-based scientific papers on early years reading instructions and methodologies,
4. Creating awareness on reading culture among the stakeholders and increasing knowledge in reading instructions in HEIs in Ethiopia and South Sudan.

Partners: Oslo and Akershus University College of Applied Sciences in Norway, Bahir Dar University and University of Juba in South Sudan.

Supported by: NORAD, Norway

Project Period: 2016-2021

Total Budget: 14,998,991 ETB

Project title: *Investigation and Development of Local Language Resources for Information and Predictive Systems*

Project leader: Demeke Asres

Email address: demekeayele@gmail.com

Phone: 0911107468 (Cell)

Project description: To investigate and develop basic language resources (Tokenizers, stemmers, POS taggers, morphology analyzers, parsers and grammar checkers for three languages (Amharic, Oromifa and Tigrigna).

Partners: Department of Linguistics and Philology, Department of Information Science – Addis Ababa University

Supported by: Ethiopian Science and Technology

Project Period: 2016 to 2019

Total Budget: 4,444,672.00 ETB

COLLEGE OF HEALTH SCIENCES

Project Title: *A planning Grant to Establish a Global Environmental and Occupational Health (GEO Health) Hub on Research and Training for East Africa.*

Project leader: Dr. Abera Kumie

Email: Aberakumie2@yahoo.com

Phone No.: 0911882912

Project description: The GEO Health hub planning grant aims to assess the situation and identify the gaps and needs on three areas. These are, namely, Air Pollution, Climate Change and Health, and Occupational Health and Safety in an effort to establish a training and research hub East African region that will be used as a research and Training Centre on Environment and Health. This is a collaborative project of AAU with the University of Southern California (USC) (U.S.A). The scope of the project includes partner Universities in East Africa: Makarare University (Uganda), Masai Mara University and Great Lakes University (Kenya) and University of Rwanda (Rwanda). So far, all the three partner countries have completed their SANA- Situational Analysis and Needs Assessment- Reports. The third year is planned for completing the project report with feedbacks to stakeholders, publication, dissemination, and initiating a pilot research in ambient air pollution in Addis Ababa. The fund is planned to support nominal payments for key investigators, workshops, purchase of air monitoring sampling equipment, cost of travels, and support to partner-universities in East Africa (Uganda, Kenya, and Rwanda).

University of Rwanda (Rwanda). So far, all the three partner-countries

Supported by: National Institute of Health/Fogarty International Center

Project period: 2014 - 2015

Total budget: 1,500,000 ETB

Project Title: *Neurosurgical Outcome Monitoring Database Project*

Project leaders: Dr. Abenezer Tirsit, Dr. Azarias Kasshun, Dr. Tsegazeab Leake
Phone: 011515 27 53 or 0912 14 3110 (Dr. A. T.)

Dr. Azaria Kaahun
Email: Azarias.kassahun@yahoo.com
Phone: 0111 56 77 51 (office) or 0911 14 94 14

Project description: This project involves developing questionnaires' and recording demographic data, important preoperative and post-operative information for all operated neurosurgical cases in the three teaching hospitals (Black Lion, Zewditu Memorial and Myung Sung Christian Medical Center). The data will be used to assess outcome of all operated patients and subsequently improve the patient care. We believe it will be an important tool to improve quality of services by developing a monitoring method like periodical mortality and morbidity sessions. In addition, it will be an important input for research activities.

Supported by: University of Bergen, Haukeland University Hospital, Norway
Project period: 2014 - 2018
Total budget: 165,000 ETB

Project Title: *Centre for Innovative Drug Development and Therapeutic Trials for Africa (CDT-Africa)*

Project Leader: Dr. Abebaw Fekadu, Associate Professor

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Phone: 0118962052

Project description: Poor *access* to safe and effective health interventions is a formidable development challenge in Africa. The Centre for Innovative Drug Development and Therapeutic Trials for Africa (CDT-Africa) seeks to improve *access* to essential interventions (medicines, vaccines, point of care diagnostics and behavioral interventions) and bring about *sustainable development* in Africa through high quality multi-disciplinary innovative translational research and training in therapeutic discovery. Addis Ababa University (AAU) through its College of Health Sciences (CHS) will lead the center. CDT-Africa will be open to support capacity development across Africa. Five national, five regional, several international higher education institutions, industries, and other organizations engaged in therapeutic discoveries will participate actively in the implementation of the activities of CDT-Africa. However, the scope of capacity building will target all interested higher education institutions, relevant industries and private organizations across Africa.

The specific activities of CDT-Africa to achieve its objectives are shown in four categories:

1. Human and infrastructure capacity enhancement through:

- High quality education (MSc, PhD, and short courses) to build a critical mass of scientists and technical experts for therapeutic discoveries;
- Infrastructure upgrade to support training in drug discovery and clinical trials in the region;
- Strengthen quality management of education, knowledge and research

2. High quality research to support capacity building for therapeutic discovery through
   - Establishment of a database of scientifically tested natural products, which will serve as resource for translational research and accelerate pharmaceutical innovation in Eastern and Southern Africa;
   - Conduct of drug discovery studies using the database;
   - Repurposing of currently available interventions;
   - Bioequivalence and pharmacogenetic studies of medicines to ensure safety and effectiveness
   - Implementation of pharmaco-economic evaluations
   - Building foundational skills and assets to innovative point-of-care diagnostics
3. Support of skill development for industrial manufacturing in the region.
4. Establishment of sustainable impact through medicinal plants conservation, public and policy engagement and sustainable financing.

CDT-Africa will also support regional capacity development for improving detection of counterfeit products and capacity for efficient drug regulatory processes. The center will engage with the public and will put in place stringent scientific and public oversight of its activities.

CDT-Africa will run through three overlapping phases:

Phase 1 will focus on establishing the necessary infrastructure, which includes establishing smooth relationship with the network of partners. PhD students and Master students will be recruited into existing programs. We will establish the natural products database and medicinal products mapping will be completed.
Phase 2 will involve launching of new training programs and conduct of original translational research by faculty and students
Phase 3 will ensure all the planned activities of CDT-Africa are implemented and focused on sustainability of the center.

Partners: Nationally Bahir Dar, Debre Tabor, Jimma, Mekelle and Gondar Universities;
African: Makerere University, Mbarara University of Science and Technology, Muhimbili University of Health and Allied Sciences, University of Malawi, University of Zambia
Internationally Brighton and Sussex Medical School, Broad Institute, Harvard Medical School (including the Catalyst), Karolinska Institute of Sweden, King's College London, MIT and Ohio State University
Other key national and international research and industrial institutions: Addis Pharmaceuticals, AHRI, EMA, EPHARM, EPHI, Gulele Botanical Garden, FIND, IDRI, mPedigree, Novartis
Project period: 2017-2021
Total budget: 125,000,000 ETB

Project title: *Indefinite Quantity Contract. Firm Fixed Price Rate Testing and Method Development for Product Quality Assessment of Pharmaceutical Products.*

Project leader: Dr. Ariaya Hymete

Phone No.:

Project description: SCMS facilitates availability of drugs in African Countries and Submits samples to bepurchased for pre-qualification analysis if positive results are obtained from the analysis, same samples will be submitted to concerned regulatory bodies for final analysis and decision.

Supported by: SCMS, USAID

Project period: 2013 - 2015

Total budget: 3,805,500 ETB

COLLEGE OF LAW AND GOVERNANCE STUDIES

Project title: *AAU Clinical Legal Education Public Interest Project*

Project leader: Dr. Gedion Timothewos

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Phone: 0917 8044 93 (Cell)

Project description: Addis Ababa University School of Law has started implementing the Clinical Legal Education Public Interest Project after signing an agreement with the Royal Danish Embassy in December 2014. The goal of the Project is realizing practice oriented legal education through faculty and student-run clinics offering free legal aid service to the poor and disadvantaged sections of the society. The project aims to establish model clinical programs that provide free legal aid; undertake action oriented research; support local human right organizations with technical capacity and contribute towards building the capacity of clinical programs throughout the country.

Some of the illiterate community members who seek legal advice

Supported by: Royal Danish Embassy (Denmark)

Project period: 2015 - 2018

Total budget: 6,500,000 ETB

Project title: *Human Rights Program*

Project leader: Dr. Wondemagegn Tadesse

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Phone: 0111223783 / 0911612573

Project description:

The Project is designed to assist the Center in its teaching, research, and community services. As part of community undertakings, the Project foresees a series of policy dialogues and capacity building trainings with stakeholders, particularly of policy makers, universities, and community organizations engaged in governance and human rights. Grassroots trainings and promotion of human rights will also be undertaken through 6 project sites in Adama, Hawassa, Ambo, Gambella, Semera, and Addis Ababa with the help of community organizers and local advocates of good governance and human rights. The Project will also provide legal aid services to vulnerable groups with the involvement of law students and teachers from Universities located around Project sites. Regarding research, the Project incorporates wide-ranging theoretical and empirical studies to be carried out by academicians, researchers and practitioners from various disciplines (including law, development studies, political science, media and cultural studies). The teaching component incorporates the preparation of textbooks on selected topics, the acquisition of books and materials relevant for teaching-learning, and the design and implementation of graduate programs deemed necessary. It has also exchange programs that allow the

Center's students to have exposure to Universities abroad and international students and scholars to come to the Center in order to share experience and carry out researches. In addition to the general issues of good governance and human rights, the Project in all its activities will emphasize on issues dealing with vulnerable groups identified, namely women, children, migrants, workers, and persons with disability.

Partners: Universities, Democratic Institutions (such as the House of Peoples' Representatives), Governmental Organs, Civil Societies, and Community Organizations
Supported by: Governments of Norway and Sweden
Project period: 2017-2020
Total budget: 60,000,000.00 ETB

COLLEGE OF VETERINARY MEDICINE AND AGRICULTURE

Project title: *African Animal Trypanosomosis: exploration into trypanocidal drug resistance and efficacy of novel alternative compounds*

Project leader: Dr. Getachew Terefe

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Phone: 0913171784 (Cell)

Project description: Animal trypanosomosis is endemic in 37 African countries affecting 10 million km^2 of arable land and remains a major constraint to livestock production in particular agricultural production in general. In the absence of vaccines control of this disease has for long been focused on chemotherapy and vector control. For many decades, only three compounds have been widely used as trypanocides: diminazene, isometamidium and homidium, and consequently drug resistance in the target pathogens has become a major concern. Therefore, novel and effective drugs to combat this disease are urgently needed. This study is therefore to identify resistant recent field isolates from Ethiopia that can be used in subsequent studies for the evaluation of efficacy of novel trypanocides. The project has three phases: phase I: construction of fly-proof animal facility and procurement of all the necessary laboratory equipment and consumables, Phase II: experimental drug resistance study on two pathogenic species of trypanosomes (*T. vivax* and *T. congolense*) and phase III: drug efficacy trial against resistant strains using novel compounds to be supplied by the collaborating group. This project is to be supported by and done in collaboration with the Global Alliance for Livestock Veterinary Medicine (GALVmed) who is supporting research, development, validation and deployment of animal health products and services that benefit resource poor livestock keepers in the developing world.

Fly proof cattle facility established by GALV med, UK at college of veterinary medicine and agriculture, Addis Ababa University

Supported by: Global Alliance for Livestock Veterinary Medicine (GALVmed)

Project period: 2013-2018

Total budget: 7,720,000.00 ETB

Project title: ***The Health and Livelihoods, One Health approach to study a range of issues at the interface of human and animal health and livelihoods (Website: www.healgroup.org)***

Dr. Fufa Abunna,

Email: fufa.abunna@aau.edu.et and apstring@ncsu.edu

Phone: 0911 89 94 35

Dr. Dinka Ayana

Dr. Andy Stringer, College of Veterinary Medicine, NCSU, USA

Project description: The HEAL Group studies a range of issues focused on the interface of health and livelihoods in Sub-Saharan Africa utilizing a One Health approach. We combine approaches from the biological and social sciences to understand the determinants of health and their relationships with livelihoods. Our goal is to understand the health constraints of both animals and people, and to use this information to improve livelihoods through effective interventions.

Partner: North Carolina State University (NCSU), USA

Supported by: North Carolina State University (NCSU), USA

Project period: 2016-2017 with possible extension

Total budget: 540,000 ETB

Project title: *Parasite mapping in Ethiopia*

Project leaders: Dr. Bersissa Kumsa

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Phone:

Dr. Dinka Ayana, College of Veterinary Medicine and Agriculture

dinka_ayana@yahoo.com or dinka.ayana@aau.edu.et

Project description: Parasite mapping project will provide an opportunity for African institutions (private and governmental) to interact and collaborate enabling mutual capacity building. The initial research phase of parasite mapping project will involve a thorough desk review. This is followed by working with local partners to determine the ecto- and endo-parasite species with the highest prevalence and economic importance to livestock (small and large ruminants, pigs and poultry) of small-scale rural farmers in specific pre-selected areas of Ethiopia, Tanzania, Uganda, Nigeria, Ghana and Burkina Faso (three East African and three West African countries). For the livestock species prioritized by the project sponsors the relevant parasite strains will subsequently be collected and established in a laboratory for future evaluation of the effectiveness of different pharmaceutical and biological products and control strategies.

The project attempts to **i**dentify the most economically important ecto- and endo-parasites affecting the smallholder livestock production systems in Ethiopia to provide a solid scientific basis for their future control.

In the first phase of the project period:

1. Establishing the ecto- and endo-parasite priority lists for small holder livestock production systems in Ethiopia,
2. Collect strains of the most important ecto and endo-parasites and establish their pure colonies in the laboratory.
3. Establish the current baseline prevalence of the most important ecto- and endo-parasite species that are of greatest importance to the smallholder livestock production systems in Ethiopia,

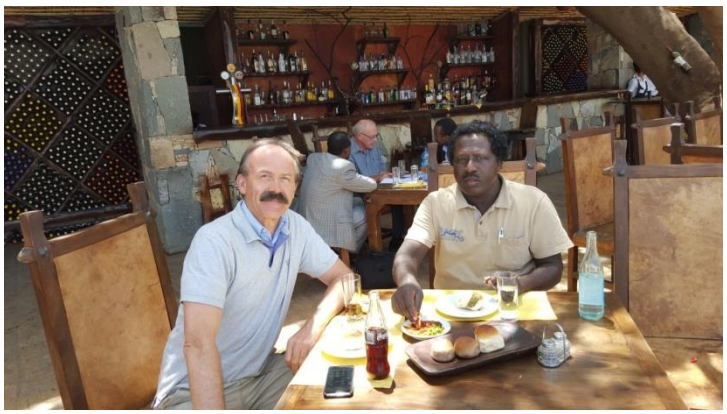
The second phase will work on:

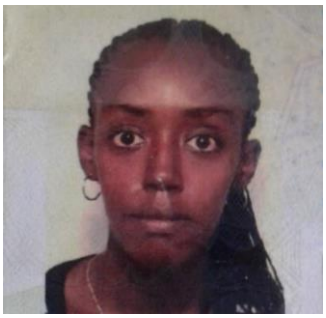
1. Laboratory evaluation of the effectiveness of different pharmaceutical and biological products for control of the most important ecto- and endo-parasites in Ethiopia,
2. Field evaluation of the effectiveness of different pharmaceutical and biological products for control of the most important ecto- and endo-parasites in Ethiopia.

Partners: Not given

Supported by: CLINVET International based in South Africa CLINVET"

Total budget: not given





Project title: *Society for the Protection of Animals Abroad (SPANA)*

Project leader: Dr. Hanna Zewdu

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Phone: 0114 33 70 56 or 0114 33 70 57 or 0911 38 54 52

Project description: Two British women, namely, Mrs. Frances Kate Hosali and her daughter Nina, founded SPANA in 1923. It operates in several countries of the world where the permanent centres are in eight countries: Morocco, Algeria, Tunisia, Mauritania, Mali, Jordan, Syria and Ethiopia. There are some temporary outreach project and emergency projects in some other countries. It is a joint project between the College of Veterinary Medicine and Agriculture of Addis Ababa University and SPANA-UK and established in March 2003. It operates in 10 cities/towns: Bishoftu, Modjo, Adama, Shahsmene, sheno, Sebeta, Holeta, Batu in Oromia region; Akaki sub city in Addis Ababa; Debre Brehan in Amhara Region; Hawassa in SNNPR.

The major objectives of the project include:

1. Treatment of sick horses free of charge.
2. Provision of education on better management and utilization of horses and other welfare aspects to cart horse owners and drivers.
3. Teaching veterinary students and professionals (veterinarians, animal health assistants and animal health technicians) equine clinical medicine and welfare.
4. Helping students develop their clinical skill by practicing in the clinical skill center of SPANA.
5. Provision of education on empathy enhancement and humane aspects to schoolchildren.

The project is fully financedSPANA-International based in the UK to run the stationary clinic in Bishoftu and mobile clinics in the nine other towns – drugs, other consumables, salaries, daily subsistence allowances, fuel, etc.

1. 17 fulltime staffs - 5 animal health professionals, 2 education officers, 1 farrier, 1 harness maker and 1 animal attendant and 6 support staffs, 1 cleaner
2. A well-established equine handling facility (shared with the Donkey Sanctuary)
3. Animal handling Facility: where there are permanently kept a horse (whose name is Chocolate), a donkey (whose name is Tadelle) and six guinea pigs.
4. Three stables for hospitalization of severely sick horses
5. A mini-laboratory for basic diagnostic services (microscope, micro-haematocrit centrifuge, refractometer, ophthalmoscope, reagents, stains, etc.) and some advanced diagnostic services (endoscope, ultrasound, refractometer, etc.)
6. A harness making facility – trained personnel and a sewing machine
7. Four vehicles – for mobile clinics, educational activities, euthanasia of abandoned horses, other duties
8. Three well equipped animal welfare and humane education centers - each with one fulltime class room attendant and four par time worker teachers

Project sponsor: SPANA International based in the UK

Project period: 2003-2018 with possible extensions by the year

Project cost: Five to eight million ETB/year

SPANA-Bihoftu activities in pictures: Top-down: School children learning about animal care, farmers raising animal health issues, donkeys lining up for vaccinations and samples analyzed by SPANA-Bishoftu team

COLLEGE OF EDUCATION AND BEHAVIORAL STUDIES

Project title: *The Relevance of Primary School Calendar to the Context of Pastoralists: the Case of Pastoral Areas of Oromiya Regional State*

Project leader: Dr. Teshome Tola

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Phone: 0911 93 24 08 (Cell)

Project description: The major purpose of the study was to identify appropriate primary school calendar for pastoral communities that will help policy makers give informed decisions and enable Oromia Bureau of Education implement it in its effort to improve school enrolment and reduce school dropouts. A multiple case study design approach was followed. Data were collected from schools [students, teachers and school principals], community leaders [Abba Gadas, religious fathers, and local elders], education officers at district, zonal, regional and federal levels], researchers on pastoral community development, and officials in the MoFA [Ministry of Federal Affairs] and PCDP [Pastoral Community Development Program] III Coordination Unit of Oromia. Each of the six zones was taken as a case, though East Hararge, East Shewa and West Hararge were taken together as a case considering the similarity of their overall attributes. Questionnaire, Interviews, and Focus Group Discussion Guides were used as tools of data collection. In response to the basic research questions, the core findings of the study included the following:

1. The community seems to give priority to the livestock production over education of its children mainly because of the high value attached to livestock.

2. It was also realized that the mainstream formal school [with all its rigid attributes] is unfit for the ecological, cultural and economic situation [or variability] of the pastoralists.
3. Where adapting school calendar is one essential variable, it is not an adequate condition by itself if the perspective is to make sure that education reaches all the children.
4. The existing school calendar is not suitable for the pastoral areas.

Based on these findings, possible strategies to mitigate the challenges have been proposed in the areas of adaptation of the school calendar, contextualization of the curriculum and teacher training; diversification of program delivery approaches, and adaptation of guidelines on school leadership to the context of schools in pastoralist communities.

Partners Oromia Pastoral Community Development Project [PCDP] III

Supported by: Oromia Pastoral Community Development Project [PCDP] III

Project period: 2015– 2017

Total budget: 880,208 ETB

Project title: *International and Comparative Education PhD Program*

Project leader: Dr. Temesgen Fereja

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Phone: 0911 839766

Project description: The implementation of the Growth and Transformation Plan (GTP) of the country is based on recognition that the planned economic and social transformation could not take place without a reliable stock of skilled human power and in this case capacity in education. To this end, the government had to expand education to respond to the new demands and put in place the necessary policy and implementation capacity to do educational change in practice. Moreover, it was also necessary to learn how educational reforms and changes were managed in the process of rapid economic growth and social transformation from other developing countries. However, it was clear that the education sector lacked such innovative education policy analysts, planners and both international and comparative professionals to plan national demands in comparison to international trends and experiences. Thus, developing an in-house program with an international and comparative focus has become an agenda on the national stage.

Partners: First Stockholm University, Sweden and now Gutenberg University, Sweden

Supported by: Sida/Sweden

Project period: 2017-2021

Total budget: 25,000,000 Birr

COLLEGE OF DEVELOPMENT STUDIES

Project Title: *AFRINET: An ACP-EU Technology – Transfer Network on Rainwater Harvesting Irrigation management for Sustainable Dry land Agriculture, Food Security and Poverty Alleviation in Sub-Saharan Africa.*

Project leader: Dr. Belay Simane

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Phone: 0911223044 (Cell)

Project description: The project aims to foster Science and Technology capacities on rainwater harvesting irrigation (RWHI) managementfor implementing adequate RWHI management. This is expected to strengthenthe link of Science and technology communities with the regional market, businesses/micro-enterprises, non-governmental and public sectors, policy-making actors, and local communities; to establish a long-term transnational ACP-EU network on RWHI; and to disseminate, transfer and replicate the project activities and outcomes.

Supported by: ACP-EU Co-operation Program in Sciences and Technology (S&T II), Hamburg University of Applied Sciences, Germany.

Project period: 2014 – 2017

Total budget: 4,300,000 ETB

Project Title: Brining Seasonal Forecasts to the Farmer: Participatory Climate Smart Villages for Green Growth in Ethiopia

Project leader: Dr. Belay Simane

E-mail: belay.simane@aau.edu.et or simaneb@yahoo.com

Phone: 0911223044 (Cell)

Project description: Climate change adaptation is a high priority for Ethiopia and other climate-vulnerable countries. At the farm and village level, however, long-term planning for climate change means very little. Subsistence agriculture communities survive on a year-to-year basis, and the productivity of the coming season's crops is typically too important and is often too uncertain to allow for adaptation planning on the decades-long time horizon of climate change projections. In this context, improved use of seasonal forecasts offers a climate resilience building strategy that pays dividends under current conditions and is likely to become even more essential as patterns of climate variability shift in coming years. The use of seasonal forecasts is also flexible and adaptable to context in a way that few adaptation strategies are. A specific cropping technology or seed variety may not work across agroecosystems, but improved approaches to interpreting and acting on seasonal climate forecasts can contribute to resilience in a wide range of settings.
The guiding principle for this project is that seasonal forecasts generated at the agroecosystem level, developed collaboratively with farmers, will advance understanding of the adaptation process and contribute to climate resilience in subsistence-based communities. The proposed work would leverage and expand a climate smart village (CSV) network that has proven to be an effective mechanism to engage farmers in generating climate resilience solutions. The CSVs will inform application of forecasts through participatory forecast

interpretation and communication. They will also provide a platform for linking forecasts to culturally and ecologically appropriate actions to make use of forecast information. Meanwhile, the project focus on best-available seasonal forecasts will add a dimension of capabilities to CSVs that is currently absent.

Partners: Johns Hopkins University, USA Debre Markos University, Bahir Dar University

Supported by: The National Academies of Sciences, Engineering, and Medicine; Partnership for Enhanced Engagement in Research (PEER) Program, USA

Project period: October 2016 - October 2019

Project budget: 270,000 USD

Project Title: *The Regional Institution of Gender, Diversity, Peace and Rights Project*

Project Leader: Dr. Rawha Mussie

E-mail:

Phone:

Project description: The overall purpose of the project is to build the capacities of the Center for Gender Studies and to promote knowledge, networking, and exchange of experience within the region for directing policy, enhancing advocacy dialogue, and activism on gender related issues.

The scope of collaboration and partnership on academic and research activities include:

1. Research in areas of mutual interest to both parties on the broad issues of Gender, Diversity, Peace and Rights
2. Exchange of academic materials
3. Organization of seminars, conferences, short courses and meetings
4. Curriculum development
5. Capacity building
6. Exchange of faculty
7. Exchange of Students

Partners: Afhad University, Sudan

Supported by: NORAD, Norway

Project period: 2009-2017

Project budget: 5,750,000 ETB

Project Title: *Capacity Building for Scaling up of Evidence-based Best Practices in Agricultural Production in Ethiopia (CASCAPE)*

Project Leader: Dr. Dilu Shalleka

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Project description: CASCAPE project is initiated to support the Agricultural and Growth Program (AGP) with respect to scaling up of best practices by being its scientific wing. TheCASCAPE project is initiated through funding obtained from Embassy of the Kingdom of the Netherlands. Six universities of Ethiopia (Addis Ababa, Bahir Dar, Haramaya, Hawassa, Jimma and Mekelle)and the Wageningen University of the Netherlands are implementing CASCAPE project. The purpose of CASCAPE-AAU is to identify drivers for uptake of innovations, test and disseminate these and evaluate their short and long term effects and with this knowledge stimulate scaling up of innovations. The CASCAPE-AAU operates in Central Oromiya, specifically in five Zones of the region namely Arsi, East Shewa, North Shewa, West Shewa and Southwest Shewa. One woreda where the AGP programs are implemented have been targeted for the CASCAPE-AAU in view of creating good synergy for accelerating agricultural growth on the basis of scaling up best practices. The target woredas from the respective zones are Munessa, Gimbechu, Girar Jarso, Bako Tibe and Becho.

Partners: Bahir Dar, Haramaya, Hawassa, Jimma and Mekelle)and Wageningen University of the Netherlands

Supported by: Embassy of the Kingdom of the Netherlands

Project period: 2012- 2019

Project budget (ETB): 15 million birr

Project title: *An ACP - EU Technology Transfer Network on Rainwater Harvesting Irrigation Management for Sustainable Dryland Agriculture, Food Security and Poverty Alleviation in Sub-Saharan Africa (AFRHINET)*

Project Leaders: Dr. Belay Simane and Prof. Taffa Tulu

Email: belay.simane@aau.edu.et or simaneb@yahoo.com

Phone: 0911 22 30 44 (Cell)

Professor Taffa Tulu

Project description: The AFRHINET project envisages effective capacity building for RWHI management and transnational research and technology-transfer centers, and enlarged and stronger networks between businesses/micro-enterprises, non-governmental and public actors and academic/scientific institutions in the field of RWHI management and sustainable dryland agriculture, agroforestry and horticulture.

To achieve this, the following key activities will be implemented:

1. **Baseline studies**, to assess the capacity needs, potential and market-oriented products in the field of RWHI management. Regional and national multi-stakeholders events will be held to debate on the needs and potential to improve the implementation and impact of RWHI management.
2. **Development of self-replicable capacities on RWHI management**, a two-phase capacity-building program, focusing on the scientific and theoretical basis, and the technical and practical implementation of RWHI management.

   In addition, advanced training materials complemented by practical experiences and lessons learnt will be developed and published.

3. **Research and technology-transfer centers**, to serve as hubs of knowledge and expertise in the field of RWHI and sustainable agricultural management in rural dry land areas of sub-Saharan Africa.
4. **Development of market-oriented research and technology-transfer strategies and policies**, to better capitalize on and disseminate innovative and effective RWHI management practices.
5. **Demonstration of innovative RWHI management**, to show local communities, academic and scientific institutions, businesses/micro-enterprises, and non-governmental and public organizations that implementing innovative RWHI projects for improved food security and poverty alleviation is feasible.
6. **Networking activities**, to enhance the networking capacity of academic and scientific institutions with other relevant stakeholders at national and international level.
7. **Dissemination, promotion and awareness**: a network will be established to serve as a platform for cooperation and the exchange of experience in the field of RWHI management. Regular networking, dissemination and promotion events will also be implemented and materials published. Gender equality and equal opportunities will be addressed by taking into account the particular needs of women, tribes and minority groups for capacity-building courses. Efforts will be made to respect a gender and ethnic balance in the project teams and among the participants/speakers in the capacity-building activities.

Partners: Hamburg University, Germany

Supported by: EU funded and implemented by the Africa, Caribbean and Pacific (ACP) Secretariat.

Project period: 2014- 2017

Project budget: 724,275 ETB

Project Title: *Mainstreaming the Bio-farming System in Ethiopian and Ugandan Higher Education Institutions (MAINBIOSYS)*

Project Leader: Dr. Belay Simane

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Phone: 0911 22 30 44

Dr. Engdawork Assefa

Project description: The Bio-farming approach applied in Ethiopia has as basis the three pillars of sustainability (ecological, social and economic) which the aim is to develop sustainable human settlements and self-maintained agricultural systems modelled from natural ecosystems and merging various approaches like permaculture, organic farming and conservation agriculture within a holistic perspective. The Bio-farming approach is a science and evidence-based approach to sustainable livelihood, built upon indigenous knowledge and skills, continuously integrated and implemented with recent scientific advances and relies on holistic restorative and environmental friendly methods to improve ecosystem service provision. Model farm facilities (BIOFARM) are integrated elements of Bio-farming approach and serve for demonstration, training and research purposes. BS is introduced to farmers through short intensive period of training, based on an analysis of local agro-ecological constrains and where different types of sustainable natural resource management practices are introduced into the farming systems. The establishment of BS is of particular interest in areas where resources are scarce, diversification of production activities are required and positive impact on the

ecosystem need to be ensured. The aims to contribute to foster capacity building and regional integration of Ethiopian and Ugandan Universities in the Bio farming System, and to contribute to support higher education of quality, that is efficient and relevant to the needs of the labor market and consistent with the African regions' and member countries' socio-economic development priorities.

The specific objectives are:

1. to transfer research methodology with the development of Bio-farming demonstration actions;
2. to enhance the Universities capacity building to train competent and professional experts in sustainable agriculture;
3. to establish a research network between Universities in the African Countries and with EU Universities.

Partners: Mollise University, Italy, Gulu University, Uganda, Hawassa University, and BEA, Ethiopia

Supported by:EU funded ACP-EU Co-operation Programme in Higher Education (EDULINK II)

Project period: September 2014-June 2017

Project budget (EURO**):** 70,847.00

Project Title: *Agro-Ecosystem-based System Analysis of Climate Change Impacts and Adaptation Opportunities and Risks in the Blue Nile Headwater (BNH) Region of Ethiopia*

Project Leader: Dr. Belay Semane

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Phone: 0911 22 30 44

Project description: This project analyzes climate change impacts, adaptation opportunities, and associated risks for communities of the Blue Nile headwaters (BNH) region in Ethiopia. Here, climate change is defined to include gradual changes in the average conditions and evolving patterns of climate variability, such as extreme events, on the interannual to decadal timescale. Climate change may affect hydrology, land quality, crop yields and diversity, as well as altering existing social and economic systems. The project will evaluate all impacts at the level of the agroecosystem. The agroecosystem is the intersection of a climatic ecological zone with a set of land management and cropping practices that derive from geographic, ecologic, economic, and cultural conditions. Adaptation is a function of internal adaptive capacity, rate of change, potential for informed investment, and socio-cultural and biophysical constraints. In order to address coupled adaptation processes in a comprehensive manner:

1. We will generate probabilistic agro-ecological scenarios based on patterns of past climate variability and social response (1980-2010)
2. Projected future climate impacts and response (2010-2040), household-level analysis of adaptation capacity in BNH communities, and
3. Conduct interactive planning sessions in which information on projected risks and uncertainties is used to inform climate adaptation decisions.

We will partner with community members participating in a network of Climate Innovation Platforms, allowing us to assess how probabilistic projections of change derived from state of the art climate, crop, and hydrological models can be integrated into adaptation planning. In turn, this allows us to assess how adaptive actions might maximize resilience - the ability to withstand or recover from climate-induced stress - and break the coupled cycle of land degradation and poverty that affects the region today.

This work will examine issues at the core of food security, and water security, and stability in the Nile region. The Blue Nile Headwaters are a vital water tower of Africa, giving rise to a river that is the lifeblood of downstream populations in Sudan and Egypt. Within the headwaters region itself, however, connected processes of low investment capacity and land degradation drive a cycle of depressed agricultural yields and persistent poverty, making the region especially vulnerable to climate change impacts. This cycle is reinforced by the dramatic inter-annual climate variability experienced in the region, and there is reason for concern that conditions will deteriorate in coming decades - both because climate change may bring more frequent drought and more intense rains and because land use pressures are increasing under rapid population growth. These changes have implications for food and water security throughout the region. However, the same coupling of natural and human systems that currently reinforces poverty in this region also offers opportunity. Vulnerability to climate change is determined by the magnitude of that change, the sensitivity of human and natural systems to change, and the capacity of communities to adapt in ways that reduce impacts. The proposed research approach combines best-available scientific tools for monitoring and projecting climate impacts with an unprecedented community-driven evaluation of potential adaptation strategies across a physically and culturally diverse

landscape. As such, the study will advance understanding of how vulnerable communities can best make use of uncertain climate projections for future planning. More generally, the development of climate impacts scenarios at the level of the agricultural ecosystems represents a new approach to climate impacts analysis that will be broadly applicable in the U.S. and elsewhere.

Partners: Johns Hopkins University, USA

Supported by: National Science Foundation (NSF) Award No. 1211235, USA

Project period: 2014-2017

Project budget: 2,250,000 ETB

ETHIOPIAN INSTITUTE OF ARCHITECTURE, BUILDING CONSTRUCTION AND CITY DEVELOPMENT

Project title: *Cadastral Survey Consultancy Project*
Project leader: Alemu Nebebe

Email: alemu.nebebe@eiabc.edu.et

Phone: 0911 897058

Project description: The Addis Ababa Immovable Property Registration and Information Agency has been engaged in acquiring and generating city's relevant data, i.e. parcels and accompanying spatial and ownership data. Such a valuable data has to be generated and documented applying the state of the art technology, acceptable level of technological knowhow, accuracy and precision.

A parcel of land is defined by a series of straight or curved lines that connect to form a polygon. Each line represents an individual boundary of a parcel and has dimensions that have been derived from measurements taken by a surveyor in the field. In a cadastral survey, surveyors capture or record parcels of land by performing a series of observations or measurements around the parcel boundary. Parcels share common boundaries and corner points to form a network of boundaries and points.

Hence, this project supports the office in the capacity building work, quality assurance, follow-up of the work in the field as well as in the office survey and mapping work.




Supported by: Addis Ababa City Government Land holding Registration and Information Agency

Project period: 2014-2017

Project budget: 15 million ETB

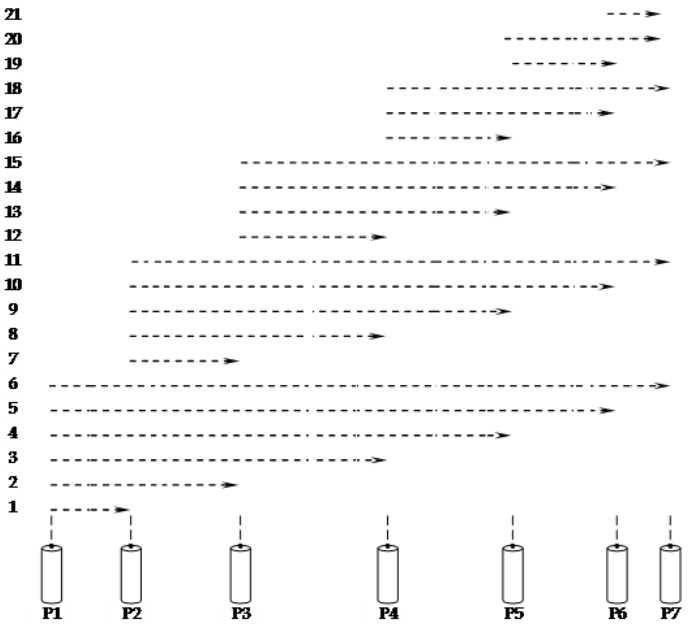
Project title: *EDMI Calibration Baseline Standard and Construction*

Project leader: Alemu Nebebe

Email: alemu.nebebe@eiabc.edu.et

Telephone: 0911 897058

Project description: Developing National standard document and construction of a baseline for calibration of EDM instrument to implement Urban Landholding Registration Proclamation (Proclamation No, 818/2014) and Urban Cadastral Surveying Council of ministers Regulation (Regulation No, 323/2014) for cadastral survey and other Ground survey work activities



Possible combination of one directional measurements on a 7-pillar EDMICB to carry out full test.

EDMI calibration baseline pillar

Supported by: Urban Land and Land Related Property Registration and Information Agency under the Ministry of Urban Development and Housing

Project period: 2014-2017

Total budget: 3.7 million ETB

Project title: *Integrated Infrastructure (IN³): A Planning Strategy for Sustainable and Resilient Spatial Structures in Emerging Cities in Sub-Saharan Africa."*

Project leader: Professor Dirk Donath, EiABC, AAU,

Professor Bernd Rudolf, Bauhaus University
Dr Zegeye Cherenet / EiABC**;** AAU, Second investigator
Dr Seven Schneider/Bauhaus University

Project description Integrated Infrastructure (In³) is an interdisciplinary international research project at the Bauhaus-Universität Weimar (BUW) and the Ethiopia Institute for Architecture, Building Construction and City Development (EiABC). The main objective of Integrated Infrastructure is to create knowledge, tools, and networks for establishing high-quality, interdisciplinary, cross-continental research and education on planning and building of resilient cities in Ethiopia and Germany. Starting from the premise that the technical infrastructure (water, energy, transport) acts as a main driver for spatial and thus also social developments. We focus on the development and implementation of an integrated planning strategy (IPS), that helps to anticipate the technical infrastructure in the planning and implementation of spatial structures (buildings, streets, lots, public spaces) in the best possible manner. The IPS connects technical infrastructure with architectural and urban spatial planning via three components, namely Technology, Simulation and Participation. The short title of the project – IN³ – shall reflect the integrative interplay of the three components. In particular, Technology (T) refers to adaptable, robust and resource efficient technological solutions, Simulation (S) to computational models for predicting urban developments and Participation

(P) to broad stakeholder participation for fostering bottom-up initiatives. By developing well-attuned interfaces between these three components we are creating a robust framework for the planning of emerging cities, since the better these interfaces work, the more effective an iterative improvement process can take place. The more effective the improvement process, the better the whole systems (building, city, infrastructure) abililty is to learn and adapt to changing situations.

The project offers funded positions both at the EiABC in Addis Ababa and at the Bauhaus University in Weimar. Furthermore, this project encourages and support interested PhD / doctoral candidates from Ethiopia and Germany to participate in the project with a PhD Thesis. We would strongly support their application at scholarship programs like the PhD scholarship programs at DAAD like In-Country/In-Region Scholarships, Eastern Africa – 2016/17 or the home grown and sandwich program from the MoE in Ethiopia (see https://www.daad.de/deutschland/en/ or http://www.daad-ethiopia.org/en/).

The following institutes at the Bauhaus University collaborate:

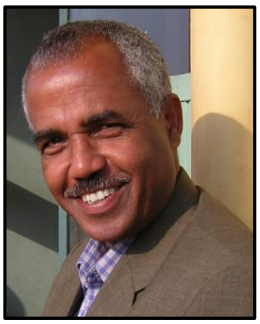
1. Institute for Experimental Building (ifex)
2. Institute for European Urbanistic (IfEU)
3. Institute for Advanced infrastructure systems (b.is)

At EiABC, the following chairs (departments) collaborate in the project

1. Urban Infrastructure
2. Architectural Design
3. Housing and Urban Development
4. Building Construction

Partners: Bauhaus University, Weimar, Germany, Ethiopian Construction Project Management Institute, Ethiopia and Flintstone Homes, Ethiopia
Supported by: Federal Ministry of Education and Research Germany, CALL Germany BMBF SSA 2015 Call (Focus Sustainable Urban Development)
Project period: 2016-2021
Total budget: 20,000,000 ETB

Sida PROJECTS COORDINATION OFFICE (SPCO)



Project title: *Academic Mobility for African Sustainable Development (AMAS)*

Project leader: Professor Brook Lemma

Email: brook.lemma@aau.edu.et

Phone: 0910880822 (Cell)

Project description: Academic mobility for students and staff in this project is destined to enhance exchange of knowledge and experience, which can go a long way to improving quality and outcomes of teaching, learning, research and public services for Africa.

Given the present advances in communication, globalization and the speed of knowledge creation, mobility of the academia through AMAS will be instrumental in creating the stage for contextual and evidence based development for Africa with effective knowledge exchange between five universities in four distinct regions of the continent.

The participating African universities have a lot to share through intra-African academic mobility to enhance quality outcomes in teaching, learning, research and services for the benefit of other universities on the exchange program.

Partners:Moi University, Kenya, Coordinator (East Africa)

Univrsité Mohammed V de Rabat (UM%R), Morocco, partner (North Africa)

Addis Ababa University, Ethiopia, partner (Eastern Africa)

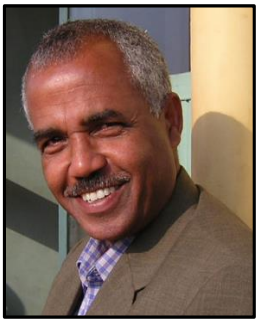
Université d'Abomey-Calavi (UAC), Benin, partner (West Africa)

Eduardo Mondlane (UEM), Mozambique, partner (Southern Africa)

Bayreuth international Graduate Scholl of African Studies (BIGSAS), Bayreuth University, Germany, Technical Advisor from EU country

Supported by: The European Union (EU), **Project period**: 2017-2020

Total budget: 36,400,000 Birr



Project title: Africa Regional International Staff/Student Exchange: Food Security and Sustainable Human Wellbeing II (ARISE II)

Project leader: Professor Brook Lemma

Email: brook.lemma@aau.edu.et

Phone: 0910880822 (Cell)

Project description: the Africa regional International Staff/Student Exchange: Food security and Sustainable Human wellbeing program (ARISE II) is designed to enhance mobility and collaborative research in the field of agriculture, food security and health sciences. The program focuses on the fields of agriculture, medical sciences, engineering and energy out of commitment from the consortium to develop African capacity in food security and sustainable human wellbeing. This theme was selected in response to the mutual challenges of persistent poverty, food (in) security and health crises experienced by the countries in which the African partners are located. As such, this is strongly linked to meeting the Sustainable Development goals of the United Nations.

Leveraging off the commitment by the consortium under ARISE, this program aims to provide resources and opportunities for students and staff mobility throughout four resource and opportunities for student and staff mobility throughout four regions of Africa, offering support for masters and Doctoral studies as well as short-term research and administrative visits between consortium partners. ARISE II will offer approximately 46 mobility opportunities.

A central tenet of ARIE II is to promote equity in higher education. The project therefore strongly encourages the participation of female candidates. In line with the adherence to the principles of equity, the project will operate within the

framework of promoting the crosscutting tenets of equal opportunities, gender balance and participation by disadvantaged groups.

ARISE II is a project of the Intra Africa Academic Mobility Scheme which promotes cooperation between higher education institutions (HEIs) and supports mobility in Africa, the. The program aims to increase access to quality education that will encourage and enable African students to undertake postgraduate studies, and to promote student retention in the region along with mobility of staff (academic and administrative), while increasing the competitiveness and attractiveness of the institutions themselves. The Intra Africa Academic Mobility Scheme provides support to:

1. higher education institutions to set up inter-institutional cooperation partnerships between universities from different countries within the Africa
2. individual students, researchers and university staff to spend a study / research / teaching period in the context of one of the above mentioned cooperation partnerships;
3. The program builds on the African Union's Mwalimu Nyerere Intra Africa Caribbean and Pacific program for Africa. It operates with specific aims, which include:
4. providing access to higher education for students including those from disadvantaged groups;
5. contributing to the improvement of the quality of higher education through the promotion of internationalization, and harmonization of programs and curricula within participating institutions;
6. enhancing the international cooperation capacity of HEIs in African countries;
7. enabling students, academics and staff to benefit linguistically, culturally and professionally from the experience gained in the context of mobility to another country;

8. Enhancing, in the medium-term, the political, cultural, educational and economic links between the participating countries.

The objectives of ARISE II are:

1. To increase the number of qualified postgraduates in the selected fields
2. To combat brain drain.
3. To promote equity in access to quality higher education
4. To create mechanisms for knowledge and skills circulation on the continent.
5. To create opportunities for academic and administrative staff mobility.
6. To broaden the professional and research networks of the awardees.
7. To create a sustainable framework of relationships which will continue to support future academic endeavors.
8. To develop a better mutual understanding of credit recognition.
9. To work towards a single credit system.
10. To work towards developing joint / dual / sandwich postgraduate degrees (where national legislation allows).

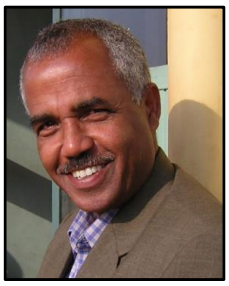
For more information on the Intra Africa Academic Mobility Scheme and the Educational, Audio visual and Cultural Executive Agency

Partners: University of Cape Town, South Africa (Coordinator), Addis Ababa University, Ethiopia (Partner), Makerere University, Uganda (Partner), University of Ghana, Ghana (Partner), International Educational Association of South Africa, South Africa (Associate Coordinator) and University of Leuven / KU Leuven, Belgium (Technical partner)

Supported by: The European Union (EU)

Project period: 2017-2020

Total budget: 36,400,000 Birr



Project title: *Commissioned Education Program*

Project leaders: Professor Brook Lemma and Dr. Lars Hartvigson, Jönköping University (JU)

Emails: brook.lemma@aau.edu.et or brklmm2008@gmail.com, lars.hartvigson@ju.se

Phone: 0910880822 (Brook)

Project description: This program is different in the sense that it is not about capacity building at any degree level, be it at bachelor, masters or PhD levels. It is about capacity building of civil societies in Ethiopia that have direct access to community development. In other words, it is about directly helping those that help the society, particularly the rural societies of Ethiopia who are challenged with poverty, climate change impacts, and health problems from old diseases such as malaria, lack of access to education, improvement of local languages and so on.

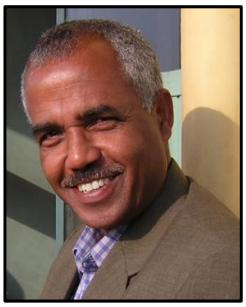
Discussions of the presidents of AAU and JU at the inauguration ceremony of the Commissioned Education Program Project

Partner: JU, Sweden

Supported by: Sida, Sweden

Project period: 2017—2021

Total budget: 68,600,000 ETB



Project title: *Support to Research, Training and Capacity Building at Addis Ababa University (SRTCB-AAU): 2018-2023*

Project leader*:* Professor Brook Lemma

Emails: brook.lemma@aau.edu.et or brklmm2008@gmail.com

Phone: 0910880822

Project description: Sida entered into a new modality of special block grant agreement with Addis Ababa University in order to support Addis Ababa University's new initiative on graduate expansion, more specifically the in-house PhD program as well as research development.

1. The main components of the project as outlined in the inception plan were:
2. Expanding the graduate program and launch in-house PhD programs and research;
3. Establish centers of excellences in the needed areas;
4. Improve library services and enhance research facilities commensurate to the existing and envisaged PhD programs.
5. Improve the Administrative and academic reform to support the in-house PhD program
6. Putting in place integrated automated administration system that included digitizing the finance, research and student record keeping and retrieval systems

Accordingly, the project had the following specific objectives:

1. To launch and execute quality in-house PhD programs;
2. To strengthen the existing research capacity of the University;
3. To establish relevant centers of excellence;

4. To support the administrative reform and improve efficiency of the administrative wing in running PhD program and the associated research; and
5. To improve library services and enhance research facilities commensurate to the existing and envisaged PhD programs.

The project started to be executed under the following major headlines:

1. Graduate programs and research;
2. Administrative and academic reform;
3. Integrated budget and finance information system (IBFIS); and
4. Graduate library expansion.

The *Agreement* required an end-term review to assess progress made by AAU in the implementation of the Block Grant as stipulated in the *Agreement*. Article 7 of the *Agreement* calls for an End-Term Review to "monitor and follow up on the reform and the qualitative and quantitative aspects regarding the expansion of PhD programs before the end of 2011".

The *Agreement* was signed to cover the period of 5 years as of July 2009. The first phase of which extends from July 2009 to December 2011.

Partner: Swedish Universities

Supported by: Sida, Sweden

Project period: 2018—2023

Total budget: 142,217,756 ETB