



AAU-Sida Projects: Year II Technical Report of the Second Project Year (2019-2020)



**Prepared by Sida Projects' Coordination Office in
Collaboration with the AAU Beneficiary Units**

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Table of contents

Reflections on the past two project years (2018/2019 and 2019/2020)	1
I. Major Collaborative Projects	6
1. PhD in Electrical Power and Control Engineering	6
2. Biotechnology for Environmentally Safe and Sustainable Food Security and Green Development Program	14
3. Management and Economics PhD Program	69
4. International and Comparative Education PhD Program	96
II. Support to Research Training and Capacity Building	109
5. Sida Projects' Coordination Office (SPCO): Annual Report/Achievements of 2019/2020	109
6. Women Children and Youth Affairs Directorate	117
7. Directorate for Special Needs Education/Special Needs Support Center	130
8. Directorate for Research	131
9. Graduate Program	134
10. University Industry Linkage and Technology Transfer (UILTT)	140
11. Addis Ababa University Libraries	145
12. Projects without activities in the year of 2019/2020 budget year	147
Conclusions	148
Supplement to the 2019-2020 AAU-Sida Projects Technical Report:	
UILTT with images	149
Annexes:	
Management and Economics PhD Program with images	158
International and Comparative Education PhD Program with images	166

List of figures

- Fig. 1:** Clockwise: PhD student Dawit Habtu defending his proposal AAU/AAiT in the presence of his supervisor Prof. Eric and AAU professors and Students October 25th 2019; Dire-Dawa Substation visit to examine problems associated with insulators (Prof. Gubanski of Chalmers, PhD student Berhanu Zelamem and Dr. Mengesha Mamo of AAU) January 16th 2020; and Coffee break in Dire-Dawa after visit to Substation, January 17th 2020 **13**
- Fig. 2:** Training of IoB staff on doctoral supervision in Sweden. Standing from left to right, Dr. Alexandra D' Urso (SLU trainer and coordinator of the training), Dr. Addis Simachew (IoB trainee), Dr. Tesfaye Sisay (IoB trainee), Dr. Tileye Feyissa (IoB trainee), Dr. Adey Feleke (IoB trainee), Dr. Diriba Muleta (IoB trainee), Dr. Abiy Zegeye (IoB trainee) and classroom activities during the training. **14**
- Fig. 3:** Discussions carried out between AAU and SLU teams on the overall issues of the project, its specific sub-projects and four PhD students at SLU, Sweden **14**
- Fig. 4:** Dr. Johanna Lindhal and Prof. Mikael Berg, from SLU, presenting seminars for the staff and students of Institute of Biotechnology, Field visits to dairy farms in Addis Ababa: from right to left: Dr. Tesfaye Sisay, Prof. Mikael Berg and Dr. Johanna Lindhal of SLU, and Yisehak Redda, PhD student at the Institute of Biotechnology **15**
- Fig. 5:** Overview of hydroponic experiment **24**
- Fig. 6:** Finger millet seedlings grown under different Al concentrations (A = control (0 μ M), B = treatment at 75 μ M Al concentration, and C = treatment at 100 μ M) for 10 days **25**
- Fig. 7:** Graphical illustration of data collected from control and treatments **26**
- Fig.8:** Leaf samples collected from 3 week aged plants for DNA extraction **26**
- Fig. 9:** Extracted Genomic DNA test gel for its quantity **27**
- Fig. 10:** PCR optimization test gel results obtained from four primers **27**

Fig. 11: Image (1) show land preparation and planting and (2) sorghum landraces at seeding stage. Images (3) show sorghum landraces at flowering stage and (4) sorghum landraces at harvesting stage	30
Fig.12: The advisor (red shirt) supervising data collection and outcomes in the field where almost half of the sorghum landrace did not give yield due to moisture stress, Kobo Site	31
Fig. 13: Clockwise: Holeta, Akaki, Chafe Donsa and Sinana Research Sites 33	
Fig. 14: Clockwise: Filed performance at Holeta, Akaki, Chafe Donsa and Sinana Research Sites	34
Fig. 15: Left: Harvesting and right: laboratory analyses of collected samples at Kulumsa and Holeta site	35
Fig. 16: Greenhouse experiments	39
Fig. 17: Laboratory experiments on <i>Guizotia abyssinica</i> (Noug) described above	39
Fig. 18: Seedlings development	40
Fig. 19: Left to right: Extracted of crude oil, refluxing of crude oil and extraction with n-hexane	42
Fig. 20: Left to right: Left to right: Drying with anhydrous Na ₂ SO ₄ , Filtration and Concentrating by rotavapour	42
Fig. 21: Sample preparations: Clockwise: Digestion, distillation, titration and Nitrogen content determination of <i>B. carinata</i> using Kjeldahn method	43
Fig. 22: Spectra collection of <i>B. carinata</i> samples using Tango-Bruker FT-NIR	44
Fig. 23: Aggregate spectradata of <i>B. carinata</i> genotypes collected using Tango-Bruker FT-NIR	45
Fig. 24: Left: Reagenants of erucic acid construct and Right: wax ester	49
Fig. 25: Polymerase chain reaction analysis of putative transgenic plants of <i>B. carinata</i> : Clockwise: Wax ester +ve (Lane 8), Wax ester +ve (Lane 1 and Lane 5), wax ester +ve (Lane 9 and 12), and Ericic acid +ve (Lane 9 and 12).	49
Fig. 26: Sample collection in the field	53
Fig. 27: Project activities from discussions to sample collections	59
Fig. 28: Extracellular lipase producer that showed orange florescence under UV	

light observation in Rhodamine b dye containing olive oil agar plate	61
Fig. 29: Isolates that showed lipase activity in pNPP assay at 65°C	62
Fig. 30: Left to right: Minister Counselor Annika N. Jayawardena, Professor Brook Lemma of SPCO of AAU and Counselor Dr. Per Sevastik of the embassy of Sweden in Addis Ababa at the Annual Review Meeting Ghion Hotel 04 and 05 November 2019. The image in the left presents Counselor Dr. Per Sevastik as he discussed some of the issues raised at the annual review meeting.	109
Fig. 31: Captured activities from the above mentioned excel training conducted on 11 and 13 December 2019	110

List of tables

Table 1: List of PhD students as of July 2020	7
Table 2: RBM for 2019/2020	11
Table 3: Activity and budget plan	12
Table 4: Annual activity / procurement Reports: 01 July 2019 to 30 June 2020 (plan towards result) of the Institute of Biotechnology	17
Table 5: All the phenotypic traits which were recorded in all locations	29
Table 6: Future planned Activities	36
Table 7: Values of fatty acids of 36 <i>B. carinata</i> genotypes	43
Table 8: Major lab activities conducted for <i>B. carinata</i> transformation experiment	46
Table 9: Number of regenerants of transformed explants in <i>B. carinata</i> (NOTE: The number of explants transferred may vary and thus number does not imply regeneration efficiency	48
Table 10: Time table for the remaining activities	55
Table 11: Short summary of my progress report	63
Table 12: Temperature of samples	64
Table 13: Nanodrop measurements	65
Table 14: Annual Report of Result Based Management: MGMT and ECON 01 July 2019 to 30 June 2020	75
Table 15: Annual Activity Report / Procurement Plan: 01 July 2019 to 30 June 2020	83
Table 16: Budget for Management and Economics PhD Program	90
Table 17: Summary of activities and budget not used in 2019-20, Unfinished Activities Due to COVID-19	94
Table 18: PhD students at different cohorts	97
Table 19: Result Based Management International and Comparative Education July 2020	103
Table 20: Result Based Management of the SPCO	113

Table 21: Annual Activity/Procurement Report, Responsible center/ person: SPCO	115
Table 22: Annual activity/ Procurement Reports: 01 July to 30/2019 to June30/2020(Plan towards Result) of OWCYA (Gender Office)	121
Table 23: Result Based Management (RBM) OWCY (Gender Office)	128
Table 24: Title, College and names of female academic winning Sida research grants Academy of (NOTE: AELC is for Ethiopian Languages and Culture, CHS for College of Health Sciences, EiABC for Ethiopian Institute of Architecture, Building Construction and City Development, AAiT for Addis Ababa Institute of Technology, CNCS for College of Natural and Computational Sciences, CBE for College of Business and Economics, CSS for College of Social Sciences, IES for Institute of Ethiopian Studies, IER for Institute of Educational Research and IPSS for Institute of Peace and Security Studies)	133
Table 25: List of AAU Academic staff, conference theme and conference place	134
Table 26: List of PhD Students who travelled 01 July 2019- 30June 30 2020 project period	137
Table 27: Summary for short-term international stays of PhD students from 07 July 2019 to 30 June 2020	138
Table 28: Annual Activity and Financial Performance (UILTT)	142
Table 29: Addis Ababa University Libraries Financial Report for the period of 08 July 2019– 30 June 2020	146

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Last but not least, the efforts of Ethiopian and Swedish professors are highly acknowledged for their persistent and committed actions to get AAU and the Swedish Universities to the level of partnership and friendships developed over the initiation and the project years.

As always, the Ethiopian Government has supported AAU in generating the matching finding and the positive political will in the approval of the projects and resolving problems in the facilitation of the partnerships. AAU seizes this opportunity to extend its gratitude for all the support it received and continues to receive from the Ethiopian and Swedish Governments.

Reflections on the past two project years (2018/2019 and 2019/2020)

Project year 2018/2020 was the beginning of the five-year AAU-Sida agreement (2018-2023) signed on 07 July 2018. This was a remarkable year although the actual implementation of the project was started very late due to delayed disbursement of funds from the Sida side (November 2018), here represented by the Embassy of Sweden in Addis Ababa, Ethiopia. Added to this, the slow operations in AAU project implementation processes, e.g. very slow procurement processes and the slowness and inefficiency in beneficiary units in using their funds, have impacted the project. By the end of the year on 07 July 2019, nineteen million ETB was left in the project account. Despite these pushbacks, the project has achieved remarkable outcomes as indicated in the respective technical report.

Thanks again to the kind cooperation of the Embassy of Sweden in Addis Ababa; AAU was allowed to use 2018/2019 funding into 2019/2020 budget year as the funding for the latter year was also delayed. This gave AAU and Sida ample opportunities to accomplish the delayed activities that were captured in the 2018/2019 activities in the budget year of 2019/2020. To meet this challenge, AAU closed the 2018/2019 budget year by 07 July 2019, set its financial records straight and continued on with the 2018/2019 activities in 2019/2020. This gave both AAU and Sida breathing time to arrange the audit reports of 2018/2019 and the disbursement of the 2019/2020 budget year.

A special assignment was taken up by the Embassy of Sweden in Addis Ababa and AAU represented by the SPCO to recognize the 40 years of AAU-Sida collaboration in this second project year of 2019/2020. This was an exciting assignment which was initiated at a meeting held at the Embassy of Sweden back in 2018. This meeting was chaired by Mrs. Annika N. Jayawardena, Minister Counselor, Deputy Head of Mission and Head of Development Cooperation Section and Dr. Alexander Sellerholm from the Embassy side and Professor Brook Lemma from the AAU side, who served as secretary of the day. At this meeting present were renowned Ethiopian professors who used to be project initiators and leaders of the old projects that went back to the days of the Flora Project of Ethiopia in partnership with Uppsala University and the Butajira Public Health Project in which both Ethiopian and Swedish students were doing their PhD projects. The outcome of this meeting was that a roadmap was developed as to how this 40th anniversary of AAU-Sida partnership could be celebrated. AAU and the Embassy shared tasks and made commitments to finance the same. Eventually, Sida/Stockholm assigned a lead consultant from Sweden, namely, Mrs. Anita Sandstrom who would be supported by Dr. Alexander Sellerholm and Professor Brook Lemma. Later, Dr. Per Sevstik replaced Dr. Alexander Sellerholm, and made a series of

meetings with AAU academic staff, and leaders of various Sida supported projects. This task progressed well going all the way to fund allocations at a meeting held with Professor Tassew Woldehana, AAU President in the presence of Mrs. Annika N. Jayawardena, Dr. per Sevastik and Professor Brook Lemma.

In its concept, the 40th AAU-Sida anniversary will not only be a review of the past achievements and planning of the future of AAU-Sida projects. It actually wanted to leave behind a lasting footprint on AAU campus that shows the cultures and future relations of Ethiopia and Sweden by way of linking art and human rights. This was further developed into the concept note entitled “The Cube of Hope” developed by the Swedish artist-architect Dr. Michel Östlund and Dr. Bekele Mekonnen of AAU. It is planned to be a revolving cube depicting the three principles of “unity, peace and hope” of the two countries. Again, as the pandemic exploded globally, this work was stopped. Quite recently in the last week of July 2020, it is re-initiated and it is planned to start project activities by the beginning of September 2020.

This technical report therefore is a mix of both years with distinct boundaries of the account book; but again all truncated by the emergence of the corona virus pandemic. The auditable financial report that goes along with this technical report is just completed to be submitted to the Embassy of Sweden in Addis Ababa, AAU management. Before the actual launching of the auditing task, the selected external auditor will be tested on the terms of reference of the task in the presence of the SPCO, AAU management and representatives from the Embassy.

On the Sida Projects’ Coordination Office (SPCO) side, it has always attempted to meet its tasks as agreed upon between AAU and the Embassy with regular communications with Councilor Dr. Per Sevastik; and in many cases on *ad-hoc* basis, which the SPCO enjoys to do rather than committing things to paper and lengthen the bureaucratic channels. It is sad the COVID-19 pandemic affected the AAU-Sida project of 2019/2020 as it was just taking off the ground by the middle of the project year. It is even sadder to the PhD students who had to pause their research that surely will put punctuation marks in their data collections.

The SPCO highly appreciates the efforts done by Dr. Per Sevastik and Professor Olle Terenius of ISP/Uppsala University in assisting PhD students who were in Sweden when the pandemic broke out. These two committed Swedish partners have gone to great lengths to find air travel bookings at a time

when most airlines were cancelling flights, cover the 15-day quarantine costs upon arrival in Addis Ababa and other supports the students needed all the way until they got back to their homes in Ethiopia.

Dr. Per Sevastik has also very responsibly assisted the SPCO and thereby AAU in its day-to-day project activities. At the time when the pandemic broke out in Ethiopia and many health workers were caught up in a sudden unprepared manner that they started to come down with the diseases, he authorized an emergency assistance in the preparation of PPE, particularly face shields, by diverting some funding from the Research Technology Transfer project to this function.

The SPCO has always attempted to follow the AAU-Sida Agreement document in project implementations. Actually, that is what it is established for by AAU and Sida as indicated in the project document. AAU always remains grateful for the support Sida provided to launch this office. It has, however, some internal and external challenges, which in some cases these are beyond its control and in others they are manageable with constant follow ups. The difficult ones are the delays in fund disbursement, in the time it takes within the Ethiopian banks between the Embassy disbursement until AAU sees the transfer in its accounts, the slow procurement process, transfers of funds to colleges, delays in college financial reports, and similar issues recurring problems; as these have to follow government regulations under which AAU-Sida Projects are governed. It was also a sad moment when Mr. Ezgenam Berhe, the Head Controller and Mrs. Meselech Amsalu, Assistant Controller, left the SPCO after a very painful search for people of their caliber. Both left for better jobs and for the failure of AAU to provide them with the international training on financial management as captured in the project budget and agreement.

A very worrying problem is the delays principal investigators (PIs) create in reporting technical reports of complete activities and the submission of activity/budget plans for the subsequent year. The fact that one report is delayed is that all other reports are delayed as SPCO cannot submit incomplete reports to the Embassy and AAU management and at the same time, the SPCO cannot submit incomplete auditable financial statements to the external auditor.

After conducting two international meetings (Annual Review Meeting and Annual Planning Meeting) and fixing the annual activity plans with their respective budgets, there are AAU PIs that apply for change in

activities and their respective budgets, because prices have changed, because ... and so on. The AAU-Sida agreement discourages as much as possible such sudden unilateral changes in plans, activities and budget allocations. This may not mean that such changes are impossible. If at all such changes are inevitable, the agreement stipulates that the Embassy has to be consulted, minuted, provide clear demonstration the new activities generate proven improved outcomes and AAU must obtain official authorization from the Embassy. Many PIs do not want to face that hurdle and enter into argument with the SPCO as if the SPCO stands on their way. That should not continue. All PIs should read the agreement documents and compile their plans by careful understanding how they wish to use their funds and get them approved at the annual AAU-Sida meetings.

There are times when PIs leave office or get replaced by a new PI who has little or no idea of the AAU-Sida agreement and who does not know the relevance of the plans captured for the year. It was observed that in many cases, the new PIs want to change the approved activity plans unilaterally. This has been seen in the case of the University-Industry Linkage and Technology Transfer unit (UILTT) and the AAU Library. At such moments, those PIs that relinquish their responsibilities should ensure that knowledge and practices of the project are smoothly and effectively transferred for the sake of preserving the agreed upon plans to guarantee that AAU delivers the outcomes agreed upon to the best satisfaction of AAU and Sida, the donor. Such actions would build the confidence of the donor (Sida) to invest more on the development of AAU and its services to society.

There are cases of inability to consume the funds available to beneficiary AAU units. This has been particularly witnessed with the AAU-ICT and the Office of the Vice President for Administration and Student Services. This does not make other beneficiary units of AAU from falling into similar categories. The financial report on the transactions of the Biotechnology Project indicates a very serious under utilization of funds (e.g. more than seven million ETB remaining by 07 July 2020, only 8% of the fund transferred) and yet the units applies for more fund transfer from the dollar account to the ETB account. The SPCO cannot let funds float in college accounts and keep the funds depreciate by the day with ETB. Above all, financial regulations dictate that the rate of fund flow should match the rate fund utilization based on payments against legal receipts and supportive documents.

The above in-house problems and similar minor ones are correctable with discussions, trainings, continued engagements with PIs and revisiting of tasks as long as all are committed to the common and

bigger picture of building AAU and its services to the Ethiopian people. The more difficult problems are improving systemic changes such as procurement regulations to fit the management of international projects, which are inherently different from managing Ethiopian government funds.

With all optimism and commitment to deliver more than what was planned AAU, Sida and all the PIs on both sides (Ethiopian and Swedish) should go into 2020/2021 project year. But again, all PIs, Embassy staff involved the AAU-Sida Projects management, AAU management, AAU finance offices and the SPCO staff should keep in mind that as the project years progress the implementations of the planned activities and their reporting (technical and financial) gets complex. This can be seen how reports and audits of Year II (2019/2020) are more complex than those documents of Year I (2018-2019). That needs deliberate cooperation and commitment of all involved in the projects, and that should include the commitment of the students to conduct their research with seriousness and purpose to achieve the agreed upon outcomes and more.

Brook Lemma, Professor

SPCO Coordinator

I. Major Collaborative Projects

1. PhD in Electrical Power and Control Engineering

1.1 Introduction

This is a performance report on “PhD in Electrical Power and Control Engineering” project for budget year July 1, 2019 to June 30, 2020. The report is organized into three main sections. Section one is the activity plan and performance of the PhD Education Component. Section two is plan and performance of the capacity building component of the project while the third section is the budget aspect.

The budget utilization in section three is indicated based on the budget estimate and the activity performed. The actual financial transaction is to be submitted by the finance office of Addis Ababa Institute of Technology (AAiT).

1.2 PhD Education

There were five major activities planned for year 2019/20 with respect to PhD education. They are the recruitment process of 8 PhD students as a second batch, all 12 students travel to Sweden for course and research works, students’ industry internship at ABB, Workshop organization at AAU and Addis Ababa University Professors’ travel to Sweden for the students’ study plan and evaluation. Accordingly, the corresponding activity plan performance is presented in the following subsections.

1.2.1 Recruitment and Registration of new eight PhD students for 2019/2020

academic year

For academic year 2019/20, recruitment and enrolment of 8 new PhD students was planned. Accordingly, public announcement of the opportunity was made on University webpages, through social media and 31 candidates applied. The applicants’ academic credentials were reviewed; shortlisted candidates’ interviews were made by the supervising Ethiopian and Swedish Professors to select the final 8 candidates. The selected 8 students have completed their admission process of Addis Ababa University and officially enrolled as PhD students.

In this year 2019/20 the project has 12 PhD students; 4 second year PhD students who were enrolled in 2018/19 and the new 8 PhD students who were recruited and enrolled

this 2019/20 academic year.

Table 1: List of PhD students as of July 2020

No.	Name	Gender	University	Year
1.	Alebachew Tilahun Mossie	M	KTH	I
2.	Berhanu Zelalem Desta	M	Chalmers	II
3.	Dawit Habtu Gebremeskel	M	Chalmers	II
4.	Firehiwot Girma Dires	F	KTH	II
5.	Kena Likassa Nafabas	M	KTH	II
6.	Mesfin Tilahun Tessema	M	KTH	I
7.	Milky Ali Gelchu	M	Chalmers	I
8.	Michael Getachew Wolde	M	KTH	I
9.	Nebiyu Tenaye Woldegebriei	M	Chalmers	I
10.	Shewaye Gideye Samu	F	Chalmers	I
11.	Teshome Hambissa Dimbassa	M	KTH	I
12.	Yared Bekele Beyene	M	KTH	I

1.2.2 Students' travels and Stay at their Swedish Professors' Laboratories

All the 12 students were planned to stay at their professors' laboratory in Sweden for research and course work for average of six months.

Nine of the twelve students went to their corresponding Professor's laboratory in Sweden, beginning January 2020, according to the plan for research and course work. During the first few months, they had interacted with their professors and courses instructors face-to-face. Two second year students (Dawit Habtu Gebremeskel and Firehiwot Girma Dires) returned to Ethiopia earlier than their schedule. Dawit Habtu Gebremeskel returned due to the COVID pandemic while Firehiwot Girma Dires returned due to maternity. After the COVID-19 pandemic, the remaining eight students followed their course work and have been interacting with their professors online.

Two of the first year students (Michael Getachew Wolde and Alebachew Tilahun Mossie, both KTH) couldn't make the scheduled travel to KTH before COVID-19 pandemic. Their visa process took time and their travel postponed to next year. Similarly, second year student Birhanu Zelalem Desta of Chalmers was to go to Chalmers late February or early March 2020. However, his visa process took long time and he couldn't make before the COVID-19.

1.2.3 Industry internships of students

Industry stay of one month for each 12 students on average was planned for year 2019/20 academic year. The plan could not be realized because of the COVID-19. The

correspondence and meeting schedule we had with ABB colleagues were not realized due to the COVID -19.

1.2.4 Workshop organization at Addis Ababa University

Yearly workshop, on which PhD students present their progress and proposal in the presence of professors, takes place at Addis Ababa University.

The first workshop, budgeted for 2018/19 took place in November 2019. The first batch four students presented their progress report while the other four attended the workshop. The second workshop planned for 2019/20 was to take place in June 2020, but couldn't be taken place due to the COVID-19.

1.2.5 Ethiopian Visits of Professors to Sweden to Plan and evaluate activities of students with Swedish co-supervising professors

Four Ethiopian supervising professors visit their corresponding professors to plan the following year's study and evaluate last year's student performance every year. The visit was planned to take place in June 2020 to evaluate 2019/20 academic year performance and plan for 2020/21. However, it couldn't be realized due to COVID-19 pandemic.

1.3 Capacity Building Component

Major capacity building activities planned for academic year 2019/20 were supervision capacity building training for four Ethiopian professors at KTH/Chalmers, international conference participation for four Ethiopian Professors and laboratory equipment purchase. The activity plan and performances are described in sub-sections below.

1.3.1 Supervision capacity building training at KTH and Chalmers

Two Ethiopian Professors were to take PhD supervisor capacity building course at Swedish University during 2018/19, but transferred to 2019/20 budget year. It was also planned for two more Ethiopian professors and budgeted to take the same training in 2019/20. That is, all in all it was planned for four Ethiopian professors to take PhD supervision capacity building training in 2019/2020.

In the agreement document, tuition fee for the training was budgeted to be 4500 SEK per professor which is 18,000 SEK for four professors. However, it was found out that the tuition fee for foreign professors to be trained in Swedish Universities is 19,200 SEK per professor, which is 76,800 SEK for the four professors. Therefore, there is budget deficiency

of 58,800SEK for the tuition fee.

The project leadership, the school and the institute agreed that the training should not be transferred any more as students have been already enrolled and should benefit from the trained supervising professors. To this end, budget rearrangement was done to cover the tuition fee shortcoming. Three arrangements in combination were done.

(i) The coordination cost (SEK 14,400 per year) for year 2018/19 and 2019/20 has not been used and can be transferred to be paid for the tuition fee. The transfer of this 28,800 SEK was agreed.

(ii) In 2018/19 the project had budget for four Ethiopian professors' professional conference participation SEK 31,454 per professor as part of capacity building. Three professors had participated with paper contribution to the conferences. Budget for one professor is remaining. Transfer of this 31,454 SEK to the tuition fee payment is agreed.

(iii) To cover some of the course components remotely online.

With this arrangement, request was made to the AAU SIDA coordination office and four professors registered for the PhD supervision capacity building training at KTH which was to run February 2020 to May 2020. The professors (Dr. Getachew Bekele, Dr. Dereje Shiferaw, Dr. Lebsework Negash and Dr. Mengesha Mamo) traveled to KTH on March 2020 and took part in the training up to April 20, 2020 when the training was interrupted by COVID -19. The professors returned to Ethiopia and followed the course online through zoom until May 2020 to complete about 75% of the course. It was agreed that the remaining 25% be completed in the next academic year. The tuition fee payment invoice sent to AAU from KTH was kept on hold until the course is completed.

1.3.2 International professional conference participation of Ethiopian professors

The 2019/20 plan is such that four Ethiopian supervising professors go to participate in international professional conference contributing paper each year. The same plan for 2018/19 was transferred to this year 2019/20 budget year. Therefore, all in all there was a plan for 8 international conferences participation Plan during 2019/20 budget year.

Three conferences participation took place in August 2019 out of the four budgeted for 2018/19. For the 2019/20 academic year, four papers were submitted to IEEE-Power Africa conference to be held in Nairobi, Kenya. Three of the four papers were accepted for presentation on the conference. The fourth is pending. The conference date is still pending

due to the COVID-19.

1.3.3 Laboratory equipment purchase

For the Year of 2019/20, there was a plan to procure laboratory equipment worth 18,000 SEK in the project proposal. Due to the need of research equipment to one of the second year students, additional 200,000 SEK was requested for research equipment purchase for 2019/20 budget year.

To this end, specification of the equipment was done and procurement process started. However, the purchasing process was not as fast as desired. It was further delayed due to COVID-19 pandemic. The purchasing process is still active.

1.4 Budget Component of Year 2019/2020

The budget plan and budget utilization are presented in Table 2, below. The budgeted is indicated as utilized if the activity has been executed. The actual transaction and budget utilization has to be submitted by the finance section of the Addis Ababa institute of Technology. The budget item, the first column of the below table, refers to the subsections of this report.

Table 2: RBM for 2019/2020

Responsible/Center/ Person	Activity/Procurement	Time	Supplier/ Destination	Baseline/indicat or	Cost (SEK, ETB)	Planned outcome	Planned Value	Indicator
PI, all professors	Eight PhD students and recruitment Completed	July to Sept. 2019	NA	4 students already recruited	224,120 SEK	8 PhD students		8 PhD students registered
All Swedish and Ethiopian Professors	12 students stay in Sweden for six months at Universities taking courses and doing research	During Oct. 2019 to June 2020	Sweden KTH and Chalmers	Last budget year 4 students took 2 courses	356,500 ETB, 1,296,000 SEK	8 students compete their first year and 4 students complete their 2 nd year	NA	8 students took courses and worked on their research
GetachewBekele and MengeshaMamo	2 Professors take Supervision capacity building course	Sept. 2019 and April 2020	Chalmers	none	59,400 ETB 378,600 SEK	PhD supervision capacity built by 2 professors	Ability to supervise	4 professors took 75% course work
Mengesha/Getachew /Dereje/Getachew	4 Ethiopian Professors participate international conference	During Sept 2019 to June 2020	International conference hosting country	2 papers accepted this year	43,200 ETB 86,216 SEK	4 peer reviewed papers	4 peer reviewed Conference papers	4 peer reviewed papers accepted and for Power Africa Conference
Mengesha and Getachew, AAU/AAiT Procurement	15 items of Laboratory equipment purchase for ESDD and NSDD Data collection	During Sept. 2019 to June 2020	International market	none	180,000 SEK,	Ethiopian 2 Sites pollution Severity measured	Data analyzed and published	Specification prepared. Procurement not done due to COVID-19
Berhanu/Mengesha/ Gubanski/Employed data technician	Site Pollution Severity data collection for 2 sites	Jan. 2020 June 2020	Selected sites	none	Transport and salary 60,000 ETB			Dire-Dawa Site collected
12 PhD students and Ethiopian Professors	Workshop	June 2020	Addis Ababa University	One done in Sweden June 2019	30000 ETB	PhD students present progress		COVID prevented

AAU-Sida Projects 2019/2020 Technical Report

Table 3: Activity and budget plan

No.	Planned activities	Budget (SEK)			Remark
		2019/20	Utilized	Remaining	
1. Activities related to the PhD study					
I	Recruitment and Registration of new 8 PhD students 2019/20Academic year				No budget Allocated
II	Students' travel and stay at their Swedish Professors' Laboratories 12 PhD students' Air-ticket and visa processing to travel to Sweden	118,800.00	89,100.00	29,700.00	
III	Students' industry internship	No local budget component			
IV	Workshop Organization at Addis Ababa University Budgeted for 2018/19 Budgeted for 2019/20	20,000.00 10,000.00 10,000.00	10,000.00	10,000.00	
V	Ethiopian Professors visits to Sweden to evaluate students' study with Swedish Co-supervisors Air tickets DSA	224,120.00 39,600.00 184,520.00		224,120.00 39,600.00 184,520.00	
2. Capacity building					
I	Supervision capacity building training at KTH/Chalmers Tuition fee (budget transfer requested)* Air-tickets Per-diem	558,486.40 18,000.00* 39,600.00 500,886.40	483,888.00	74,598.40 18,000.00* 39,600.00 56,598.00	Budget transfer requested
II**	Ethiopian Professors' International Professional conference Participation Professional conference Participation (2018/19 and 2019/20) 8 round trip air-ticket 8 persons per-diem (5 days) 8 Conference Registrations	251,632 79,200.00 126,720.00 45,712.00	93,939.00	157,270.00** 49,500.00 79,200.00 28,570.00	
III	Laboratory equipment purchase 2019/20 budget Brought forward from 2020/21	218,000.00 18,000.00 200,000.00		218,000.00 18,000.00 200,000.00	
3. Other budgets					
I	Coordination Cost*** Year 2018/19	28,800.00 14,400.00		28,800.00 14,400.00	

No.	Planned activities	Budget (SEK)		Remark
		2019/20	Utilized	
	Year 2019/20	14,400.00		14,400.00

Supplementary notes to support Table 2, above:

- * Tuition fee was underestimated. It was supposed to be $19200 \times 4 = 76,800$ SEK. There is a deficiency of 58,800 SEK.
 - ** Conference budget for one professor not utilized in 2018/19 which is equal to 31,454 SEK is requested to be transferred to item 2.1 to cover tuition fee.
 - *** Coordination cost used for local research travels was not utilized during 2018/19 and 2019/20.
- Total of 28,800 SEK requested to be transferred to item 2.1 to cover tuition fees of the above two (at ** and ***), i.e., $31,454 \text{ SEK} + 28,800 = 60,254$ which covers the deficiency of * which is 58,800 SEK.

Illustrations of project activities



Fig. 1: Clockwise: PhD student Dawit Habtu defending his proposal AAU/AAiT in the presence of his supervisor Prof. Eric and AAU professors and Students October 25th 2019; Dire-Dawa Substation visit to examine problems associated with insulators (Prof. Gubanski of Chalmers, PhD student Berhanu Zelamem and Dr. Mengesha Mamo of AAU) January 16th 2020; and Coffee break in Dire-Dawa after visit to Substation, January 17th 2020

2. Biotechnology for Environmentally Safe and Sustainable Food Security and Green Development Program

2.1 Activities done in 2019/2020

2.1.1 Supervision capacity building

Training Provided for Institute of Biotechnology staffs on Doctoral supervision in Sweden

The following photos show some activities during the training in SLU



Fig. 2: Training of IoB staff on doctoral supervision in Sweden. Standing from left to right, Dr. Alexandra D' Urso (SLU trainer and coordinator of the training), Dr. Addis Simachew (IoB trainee), Dr. Tesfaye Sisay (IoB trainee), Dr. Tileye Feyissa (IoB trainee), Dr. Adey Feleke (IoB trainee), Dr. Diriba Muleta (IoB trainee), Dr. Abiy Zegeye (IoB trainee) (and classroom activities during the training.



Fig. 3: Discussions carried out between AAU and SLU teams on the overall issues of the project, its specific sub-projects and four PhD students at SLU, Sweden

3.1.2 Field visits, discussions on the PhD proposals, and seminar presentations at the Institute of Biotechnology by Swedish supervisors

During the visits of the Swedish supervisors to Ethiopia, they have made a number of activities including discussions among the Swedish and Ethiopian supervisors and the PhD students on the PhD proposals, issues concerning the problem of getting required consumables in local market, carrying out field visits with Ethiopian supervisors and PhD students, and also providing seminars on their ongoing research in Sweden for the staff and students at the Institute of Biotechnology, AAU.



Fig. 4: Dr. Johanna Lindhal and Prof. Mikael Berg, from SLU, presenting seminars for the staff and students of Institute of Biotechnology, Field visits to dairy farms in Addis Ababa: from right to left: Dr. Tesfaye Sisay, Prof. Mikael Berg and Dr. Johanna Lindhal of SLU, and Yisehak Redda, PhD student at the Institute of Biotechnology

3.1.3 Procurement of Laboratory Equipment and Consumables

After going through a year of purchase processing for equipment in 2018/ 2019, and reaching on identifying winner bidders, the process was cancelled due to accusations by two bidders. Therefore, we have started the process again in 2019/2020. We have made discussions with the procurement department of the main campus on possibilities of

purchasing from foreign market using our dollar account, but they told us the process is the same as what we have passed through. Therefore, we have decided to repeat the process again this year. However, because the budget was not released we could not continue this activity since there is a need for budget clearance in order to get accepted by the purchasing department.

3.1.4 Procurement of Vehicles (reshuffled from car rent budget for the 5 years)

We have started the purchase process such that communications have been made with AAU President and the request has been submitted to the Ministry of Finance and Economic Development, Ethiopia, for getting permission.

Table 4: Annual activity / procurement Reports: 01 July 2019 to 30 June 2020 (plan towards result) of the Institute of Biotechnology

Responsible center	Planned Activity / Procurement	Time	Outcome Expected including targets	Performance Indicators	Cost (ETB for the Ethiopian side)	Outcome result observed in 01/07/2019-30/06/2020	Activities done in year to obtain outcome	Remarks
Institute of Biotechnology Dr. TesfayeSisay , Dr. Addis Simachew, SPCO, HR	Employment of coordinator at IoB **	Q3- Q4 of 2019	Open Competition	0	180,000.00 (Un utilized)	Not accomplished	Not accomplished	Proper manpower thought could not be found in the market
Institute of Biotechnology Dr. TesfayeSisay , Dr. Addis Simachew, HR	Staff payment - Laboratory Technician	Q3 of 2019 – Q2 2020		Actively working lab technician for the last 6 months	100,800.00	Experiments conducted; laboratory activities during the research work of PhD students coordinated	Planning, setting up and conducting lab experiments; following up the availability and utilization lab resources; maintaining neatness of lab space and providing support to PhD students during their research work	Reports on progress of the lab activities; proper condition of the lab upon visit by supervisors
Institute of Biotechnology Dr. TesfayeSisay , Dr. Addis Simachew, Pls and Co-Pls; SPCO, Prof. Rodomiro; Supervisors in Sweden; SIDA Project Assistant Coordinator**	Trips for Sandwich Students	Q4 of 2019 – Q1 of 2020		Travelled 7 students to Sweden and engaged in their research work	210,000.00 (utilized out of 570,000.00 budgeted)	Additional courses attended by students at SLU, Sweden; Research work carried out in the lab of Swedish supervisors; lab meetings, scientific meetings, conferences attended by students at SLU	Collection of necessary documents and Visa processing; purchasing air tickets; conducting research using modern facilities and under the supervision of highly skilled manpower; enhancing research capacity through attending lab and scientific meetings as well as conferences	Travel documents Experimental data generated Laboratory Books used for carrying out experiments Meetings attended and possible travels made The remaining 10 students could not travel to Sweden because their field work that is need for their research in Sweden could not be carried out due to the current COVID-19 pandemic and the need for precautions.

AAU-Sida Projects 2019/2020 Technical Report

Responsible center	Planned Activity / Procurement	Time	Outcome Expected including targets	Performance Indicators	Cost (ETB for the Ethiopian side)	Outcome result observed in 01/07/2019-30/06/2020	Activities done in year to obtain outcome	Remarks
Institute of Biotechnology Dr. TesfayeSisay , Dr. Addis Simachew, PIs and Co-PIs; SPCO, Prof. Rodomiro, SIDA Project Assistant Coordinator*	Ethiopian Professors visit to Sweden for supervising the work of PhD students in Sweden				1,443,946.41 (Un utilized)	Not accomplished	Not accomplished	The activity was cancelled due to the current pandemic
Institute of Biotechnology Dr. TesfayeSisay , Dr. Addis Simachew, Dr. TileyeFeyissa, Dr. AdeyFeleke, Dr. AbiyZegeye, Dr. DiribaMuleta, SPCO, Prof. Rodomiro, SIDA Project Assistant Coordinator**	Supervision capacity building training at SLU (6 staffs) - "Course in doctoral supervision" located in Uppsala	Q4 of 2019	IoB staffs (6 in number) trained on supervision and mentoring of graduate students during their education and research as well as research laboratory management	Training of 6 Ethiopian supervisors of PhD students on supervision capacity; mentoring of graduate students; and research laboratory management	1,255, 353	6 IoB staffs trained in doctoral supervision	Communications to the SLU coordinator about this activity; identification of appropriate instructor in Sweden and time fixing for conduct of the training; identification of training topics among the supervisors at IoB, AAU; discussing with the instructor on the training	
							topics; travelling by 6 IoB staff to Sweden to attend the training and carry our various project activities such as discussion with the Swedish coordination team on the project issues as well as specific discussions between the AAU and SLU supervisors.	
Institute of Biotechnology Dr. TesfayeSisay , Dr. Addis Simachew, Purchase Unit of CNCS, Purchase committee of IoB-AAU; SIDA Project Assistant Coordinator**	Procurement of Laboratory Equipment	Q4 of 2018 – Q2 of 2019			9,968,319 (Unutilized)	Not accomplished	Not accomplished	The budget did not arrive to our budget center yet. We cannot process procurement without budget clearance
Institute of Biotechnology Dr. TesfayeSisay , Dr. Addis Simachew, Purchase Unit of CNCS, Purchase committee of	Laboratory Equipment Maintenance, Installation and training	Q3 of 2019 – Q2 of 2020	Pro-forma based		241,200.00 (Un utilized) . The activity was partly carried out from previous year	Malfunctioning Lab equipment maintained	Maintenance of lab equipment	Late release of the budget has affected the purchasing process. The budget did not arrive to our budget center yet

AAU-Sida Projects 2019/2020 Technical Report

Responsible center	Planned Activity / Procurement	Time	Outcome Expected including targets	Performance Indicators	Cost (ETB for the Ethiopian side)	Outcome result observed in 01/07/2019-30/06/2020	Activities done in year to obtain outcome	Remarks
IoB-AAU, SIDA Project Assistant Coordinator**					budget			
Institute of Biotechnology Dr. TesfayeSisay , Dr. Addis Simachew, Purchase Unit of CNCS, Purchase committee of IoB-AAU; SPCO, AAU President Office, SIDA Project Assistant Coordinator**	Procurement of Vehicles (reshuffled from car rent budget for the 5 years)	Q4 of 2018 – Q2 of 2019	2 field vehicles procured and being used		2,000,000 (Un utilized)			Late release of the budget has affected the purchasing process. The budget did not arrive to our budget center yet
Institute of Biotechnology Dr. TesfayeSisay , Dr. Addis Simachew, Finance Unit of CNCS; SIDA Project Assistant Coordinator**, Sub project PIs (Drs. TesfayeSisay, Addis Simachew, AmareGessesse, DiribaMuleta, AdeyFeleke, AbiyZegeye, TileyeFeyissa), Researchers attached to the sub projects, PhD students, lab technicians, SIDA Project Assistant Coordinator**, etc.	Field work (includes Per diem*, fuel and maintenance)	Q4 of 2018 - Q2 of 2019	Travels to study areas made; required samples collected and shipped to Addis; surveys made; germplasms sent to Sweden for further analysis; protocols developed; isolations have been made from collected samples		1,663,830	PhD students and their supervisors travelled to different study areas for surveys and sample collection	Refer to the annex for the detail activities	

AAU-Sida Projects 2019/2020 Technical Report

Responsible center	Planned Activity / Procurement	Time	Outcome Expected including targets	Performance Indicators	Cost (ETB for the Ethiopian side)	Outcome result observed in 01/07/2019-30/06/2020	Activities done in year to obtain outcome	Remarks
Institute of Biotechnology Dr. TesfayeSisay , Dr. Addis Simachew, Purchase Unit of CNCS, Purchase committee of IoB-AAU; SIDA Project Assistant Coordinator**	Procurement of Consumables	Q4 of 2018 - Q2 of 2019	Various consumables and chemicals required for the different research activities procured	Bidders for part of the equipment identified	2,246,337 (Un utilized)	Availability of bidders for part of the consumables needed	Preparation of specifications by an Ad-hoc committee; advertisement of the required equipment on national magazine for open bidding by the Purchase department of CNCS; Opening of bidders documents and carrying out technical evaluations by the technical evaluation committee of IoB and communicating the technical evaluations to the purchase department; announcing the technical evaluations to the bidders before opening the prices; responding to questions raised by the bidders; the process has almost finished and we will collect the consumables soon	The purchase process if very lengthy and could not be finalized in time.The budget did not arrive to our budget center yet. We cannot process procurement without budget clearance
Institute of Biotechnology Dr. TesfayeSisay , Dr. Addis Simachew, Curriculum development/ revision committee; Internal and external curriculum assessors; professors from SLU	Cost of curriculum development/ Revision	Q2 of 2020			243,000.00 (Un utilized)	Not accomplished	Not accomplished	The current pandemic affected this activity in addition to the late release of the budget. The budget did not arrive to our budget center yet

AAU-Sida Projects 2019/2020 Technical Report

Responsible center	Planned Activity / Procurement	Time	Outcome Expected including targets	Performance Indicators	Cost (ETB for the Ethiopian side)	Outcome result observed in 01/07/2019-30/06/2020	Activities done in year to obtain outcome	Remarks
Institute of Biotechnology Dr. TesfayeSisay , Dr. Addis Simachew, Finance Unit of CNCS; SIDA Project	Conference participation	Q4 of 2019	Staff and students participated in various kinds of scientific events and presented scientific materials (posters; abstracts; talks; etc)		568,890 (Un utilized). The activity was partly accomplished from previous year	1 staff member, Dr. TeklehaimanotH aileselassie, attended ICGEB-JRC Workshop "Genome Editing Applications and Beyond", held in Trieste, Italy, during 19-22	The workshop gathered experts to focus on scientific, regulatory, ethical and legal implications of the technology and deliberate	The current pandemic affected this activity in addition to the late release of the budget. The budget did not arrive to our
Assistant Coordinator**, Sub project PIs (Drs. TesfayeSisay, Addis Simachew, AmareGessesse, DiribaMuleta, AdeyFeleke, AbiyZegeye, TileyeFeyissa), Researchers attached to the sub projects, PhD students					budget	November 2019.	on opportunities and challenges that are offered by genome editing.	budget center yet
Institute of Biotechnology Dr. TesfayeSisay , Dr. Addis Simachew, Purchase Unit of CNCS, Purchase committee of IoB-AAU; SIDA Project Assistant Coordinator**	Publication Fee	Q3 of 2019 –Q2 of 2020	Based on researchers interest		149,075.25 (Un utilized budget)	Not accomplished	Not accomplished	The late release of the budget affected this activity. The budget did not arrive to our budget center yet
Institute of Biotechnology Dr. TesfayeSisay , Dr. Addis Simachew, Purchase Unit of CNCS, Purchase committee of IoB-AAU, SIDA Project Assistant Coordinator**	Library Electronic resources	Q3 of 2019 –Q2 of 2020			101,400.00 (Un utilized)	Not accomplished	Not accomplished	The late release of the budget affected this activity. The budget did not arrive to our budget center yet
Institute of Biotechnology	References	Q3 of 2019			57,000.00	Not accomplished	Not accomplished	The late release of the budget affected

AAU-Sida Projects 2019/2020 Technical Report

Responsible center	Planned Activity / Procurement	Time	Outcome Expected including targets	Performance Indicators	Cost (ETB for the Ethiopian side)	Outcome result observed in 01/07/2019-30/06/2020	Activities done in year to obtain outcome	Remarks
Dr. TesfayeSisay , Dr. Addis Simachew, Purchase Unit of CNCS, Purchase committee of IoB-AAU, SIDA Project Assistant Coordinator**		-Q2 of 2020			(Un utilized)			this activity. The budget did not arrive to our budget center yet
Institute of Biotechnology	Miscellaneous				683,887.50	Not accomplished	Not accomplished	The late release of the budget affected this activity. The budget did not arrive to our budget center yet
Dr. TesfayeSisay , Dr. TileyeFeyissa, Dr. AdeyFeleke, Dr. AbiyZegeye, Dr. DiribaMuleta, SIDA Project Assistant Coordinator**	1. Shipment / Courier postage 2. Communication and IT 3. Software 4. Sequencing and sequence analysis 5. soil and plant analysis 6. farmers training 7. Enzyme test at local industries 8. Construction of pilot plants, systems 9. Professional Fee				(Un utilized)			
Institute of Biotechnology	Proposal preparation by PhD students		Students developed proposals		-		15 of the 19 PhD students have prepared their proposals. 4 have defended publicly and the remaining are waiting for defense schedules. Discussions have been made on the proposals of the students among AAU and SLU supervisors- some in person; via e- mails and sky pies	
Dr. TesfayeSisay , Dr. Addis Simachew, IoB and SLU staff; SLU SIDA project coordinator								

2.3. Field Work

2.3.1 Sub Project 1: Field and Laboratory Work

i. Haftom Birhane, PhD student, Currently at SLU, Sweden

Project Title: Developing finger millet lines tolerant to acidic soils by integrating phenotypic screening and genomic analysis

Advisors: Kassahun Tesfaye (PhD) and Teklehaimanot Hailelassie (PhD) –AAU, Ethiopia
Mulatu Geleta (PhD) and Professor Cecilia Gustafsson, SLU, Sweden

Acid soils (with a pH of 5.5 or lower) are among the most important limitations to agricultural production. It has been estimated that 15% of the world's soil is acidic and that over 50% of the world's potentially arable lands are acidic (von Uexküll and Mutert, 1995). To decrease soil acidity, the Ethiopian government has embarked on a massive soil reclamation program. Liming of the soil combined with the application of inorganic fertilizer improved the quality of the top soil to some extent but this approach was found to be too expensive to be sustainable in the long term or even attainable in the short term for subsistence farmers (Mitchell, 2005). Given the limited access of most farmers to phosphate fertilizers as well as liming service in Ethiopia, it is necessary to increase production of crops such as finger millet, on acidic soils in an environmentally-friendly and sustainable manner.

At high concentrations, Al can be a serious threat to agricultural production because it inhibits growth of the roots through various mechanisms, inducing oxidative stress (Zheng and Yang, 2005), callose induction, peroxidation of the cellular membrane, aluminum accumulation and nutrient imbalances and that ends with cell death (May and Nordstrom, 1991). There is considerable variability in Al tolerance within species and this has been useful to breeders in developing Al-tolerant cultivars of various crops.

Finger millet plays an important role in both the dietary needs and incomes of many rural households like other African countries due to its richness in fiber, iron and calcium (Babu et al., 2007). Despite the importance of finger millet for food security in areas with soils of high acidity and its large potential for improvement, research to understand plant response to this stress is limited.

Even though it is an important crop as a food security, production of the crop is inconsistent due to biotic and abiotic stresses; aluminum toxicity is one of the factors. Hence, this research initiated with the aim of screening of finger millet germplasm and evaluates its performance at multiple locations where acidic soil is a major problem and identifies lines with tolerance to Al toxicity and P uptake efficiency. Moreover, studies to identify genomic regions and haplotypes associated with these traits will be carried out to improve finger millet for cultivation on acidic soils.

Accessions from cultivated and wild finger millet will be screened for tolerance to aluminum under laboratory conditions using a hydroponic system. Based on the results of this screening experiment, genotypes representing all the phenotypic classes (tolerant, intermediate and susceptible) will be evaluated under field conditions. Multi-location yield trials of tolerant genotypes and standard checks will be conducted to release cultivars for acidic soil regions of Ethiopia. Moreover, a whole-genome association approach will be applied to identify genomic regions and haplotypes associated with tolerance to aluminum toxicity. Markers associated with those traits will be used for marker-assisted improvement of finger millet for cultivation on acid soils by plant breeders in Ethiopia and beyond. The project is a five-year collaboration between institute of Biotechnology (IOB), Addis Ababa University and Swedish University of Agricultural Sciences (SLU), Sweden.

Completed tasks

(a) Hydroponic experiment

We have prepare hydroponic set up to screen finger millet accessions against Al toxicity



Fig. 5: Overview of hydroponic experiment

(b) Optimization of Al tolerance using hydroponic solution

To screen 400 finger millet accessions against the Al toxicity first it is must to know the optimum tolerance level of the crop. To do that we have done optimization experiment at 0, 75 and 100 μM of Al concentration on 16 national released varieties and 16 gene bank accessions using hydroponic solution. we have found there is significant variation between accessions grown under control and treatment at all Al concentrations, but the variation between accessions are not significant under 75 μM Al concentration then scale up into 100 μM and we have got the variation significant. We decided to use 100 μM as optimum Al concentration to screen 400 accessions to evaluate their performance under hydroponic and multi-site field. 150 accessions have been screened until now under treatment and control in parallel. Best performing genotypes was transplanted in to pot for crossing with the least performing genotypes having high yield.



Fig. 6: Finger millet seedlings grown under different Al concentrations (A = control (0 μM), B = treatment at 75 μM Al concentration, and C = treatment at 100 μM) for 10 days.

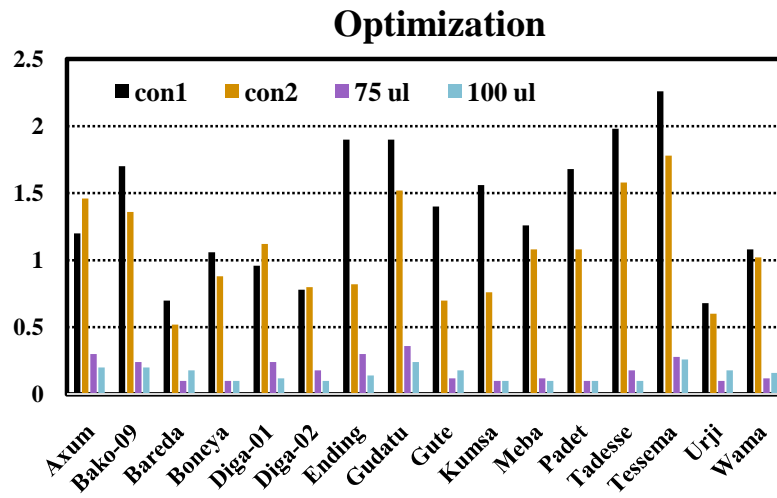


Fig. 7: Graphical illustration of data collected from control and treatments.

(c) Genetic diversity of finger millet using SSR marker

Plant materials germinated in green house for three weeks and Leaf samples collected



Fig.8: Leaf samples collected from 3 week aged plants for DNA extraction

(d) DNA extracted and genomic DNA tested for its quantity and quality



Fig. 9: Extracted Genomic DNA test gel for its quantity.

(e) PCR optimization

A total of 1956 finger millet EST sequences from National Center for Biotechnology Information (NCBI) were analyzed for mining SSRs with two to six repeat motifs using Web sat (<http://wsmartins.net/websat/>). After excluding similar, over-lapping and very short sequences as well as sequences with more than one SSR, 50 sequences containing SSRs were chosen as candidates for designing primers using the Web sat primer designing program. Out of 50, 20 primers have been selected for studying the genetic diversity on 60 accessions.

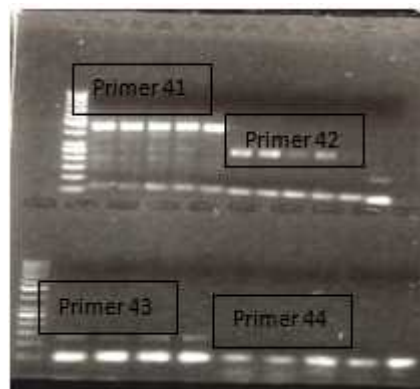


Fig.10: PCR optimization test gel results obtained from four primers.

2.4. Future plans

After screening 400 accessions using the optimum Al concentration (100 μ M), selected accessions will be further evaluated at multi-site field (Nedjo, Pawe and Hosana) in the coming summer season. Finishing the genetic diversity study on finger millet accessions as revealed by SSR marker was conducted as per the methods described in the project proposal. Then genomic

analysis will also be carried out to associate with the filed results i.e. GWAS. Selecting acidic soil particularly Al tolerant finger millet genotype using these evaluations. Organizing and publishing works which are done will also be our future plan.

ii. Muluken Birrara, PhD student currently at SLU, Sweden

Project Title: Screening and association mapping of drought tolerant sorghum genotypes in Ethiopia

Introduction

Sorghum is the fifth most important cereal crop in the world used for food and feed in the world. However, the production of sorghum is limited by moisture stress. The objectives of the project are to screen different sorghum genotypes for their responses to drought stress under field experiments and for nutrition analysis and genome wide association studies.

Completed activities

For the field experiment, about 320 Ethiopian sorghum landraces and 4 drought tolerant and high yield inbred lines (B35, Melkam, Argiti and ESH-4) were used for this study.

260 sorghum landraces and 4 drought tolerant and high yield inbred lines were collected from Melkassa Agricultural research center (MARC) originally collected by Ethiopian Biodiversity Institute (EBI). These landraces were characterized based on Day to flowering (DTF) and Plant height (PH) which ranges from 82 to 140 and 162m to 500m respectively by MARC for the purpose of purifying the accessions by selecting the most frequent genotypes in the plot.

We have collected 60 landraces from drought stress areas in Amhara region, South Wello and North Wello zone and Tigray region, Raya Azebo zone, Ethiopia. The selected sorghum landrace represents major sorghum growing regions and different agro climate zones of Ethiopia.

All the samples were sown at four locations, at Mieso sub center of Melkassa Agricultural Research Center under rain fed condition in wet soil in May 2019, at Mehoni Agricultural Research Center under rain-fed plus irrigation condition, at Melkassa Agricultural Research Center under rain fed condition on wet soil and at Kobo sub center of Sirinka Agricultural Research Center under rain fed condition in wet soil in June 2019. The experiment was laid out as an alpha lattice design with two replications in all experimental locations. Each plot consisted of 3 m length

spaced at 0.75 m. The spaces between replications was 1.5 m while spaces between blocks was 1 m. Planting was undertaken manually followed by thinning to 0.2 m spacing after three weeks of emergence (i.e., the space between plants were 0.15 m). After thinning each plot consisted of an average of 15 plants. Five plants from each plot were randomly selected based on the type of traits to take measurements for the trait of interests. Recommended amount (100 kg/ha) of di-ammonium phosphate (DAP) was applied during planting whereas the same amount of urea was supplemented after 40 days of planting. All the necessary agronomic practices were followed. Occurrence of pests was also be regularly monitored. Five plants were selected and the heads were bagged with cloth bags for the protection of seeds against pests, insects and devastating bird damages. All the phenotypic traits which are related to drought were recorded as follow in Table 5, below.

Table 5:All the phenotypic traits which were recorded in all locations

Days to 50% flowering	The number of days from planting to when approximately 50% of the plants in a plot reached half flowering stage.
days to maturity	The number of days from planting to when approximately 50% of the plants in a plot reached maturity stage.
Green leaf number	Numbers of green leaves at flowering and harvesting stage
flag Leaf length (cm)	Measured from the leaf collar to the tip were recorded as the average measurement of five flag leaves per plot.
flag Leaf width (cm)	Measured at the widest part of the flag leaf were recorded as the average measurement of five flag leaves per plot.
Leaf senescence (stay green)	Scored on a scale from 0 to5, where 5 indicate completely green leaves and 0 indicates that all leaves in a plot had changed completely to yellow.
Plant height (cm)	The length of the plant from the ground to the panicle tip at physiological maturity
Peduncle length (cm)	the average exertion of the panicle from flag leaf's blade to the base of the lowest panicle branch at maturity
Exertion length (cm)	the average exertion of the panicle from flag leaf's sheath to the base of the lowest panicle branch at maturity
Leaf chlorophyll content using SPAD	Measuring the widest part of the third leaf using SPAD-502 meter at flowering and at maturity stage
Panicle length (cm)	the average length of the panicle from the lower panicle branch to the tip of the panicle
Panicle width (cm)	the average width of the panicle at its widest section
Panicle weight (g)	the weight of un-threshed heads

Grain weight per panicle (g)	the weight of seeds threshed from individual panicles
Thousand seed weight (g)	the weight of one thousand kernels sampled from bulked seeds from all heads in each plot
grain yield	the total weight of the grain harvested from each plot

The above drought related phenotypic data collections were completed except in some late maturing accessions.

Biomass related phenotypic traits (internodes length, number of nodes, biological yield, number of tillers and stem diameter) data collections were completed except in some late maturing accessions.

Qualitative traits (leaf mid-rib color, anther color of dry anther, stigma yellow coloration, glum color, glum length, head shape and compactness and seed color) data collection were also collected except in some late maturing accessions.

We harvested half of the sorghum landraces in all locations and some the landraces is late maturing and it is at soft dough stage. We will harvest it after two or three weeks when it reaches at harvesting stage.

AtKobo sub-center of Sirinka Agricultural Research Center site, half of the landraces was not flowered due to moisture stress. The matured landraces phenotypic data collections were completed.



Fig. 11:Image (1) show land preparation and planting and (2) sorghum landraces at seeding stage. Images (3) shows sorghum landraces at flowering stage and (4) sorghum landraces at harvesting stage



Fig.12:The advisor (red shirt) supervising data collection and outcomes in the field where almost half of the sorghum landrace did not give yield due to moisture stress, Kobo Site

Challenges during field experiment

- Shortage of field vehicles
- Bird damage to crops
- Security problem
- Very high moisture stress at Kobo Site

iii. Behailu Mulugeta, PhD student currently at SLU, Sweden

Project topic: Genetic Diversity, Grain Protein Composition and Physicochemical Starch Traits of Ethiopian Durum Wheat Gene pool

The objective: To characterize and evaluate the genetic diversity, grain protein composition, and physicochemical starch traits of Ethiopian durum wheat gene pool, thus identifying genotypes possessing the important superior durum wheat quality traits and assessing their potential as a source of useful novel candidate genes for further durum wheat breeding in the country.

Planned activities

Completed courses work in Semester I and II of year one

- Advanced Molecular Biology (Biot M801)
- Genomics, Transcriptomics and Metabolomics (Biot M802)
- Proposal writing

Completed courses in Semester I of year two

- Molecular Plant Breeding (Biot M821)
- Seminar I (BiotM891)

Planned Doctoral dissertation (Biot M899) work

Under project (SP1-3), five different experiments are planned to address the objective. The activities to address the above objective are as follow.

Activity 1: Evaluation of Ethiopian Durum Wheat Landraces under Multi-environmental Conditions for Processing Quality Traits

Activity 2: Genome Wide Association Studies of Ethiopian Durum Wheat gene pools based on high-density SNP markers

Activity 3: Characterization and Evaluation of grain protein composition of Ethiopian Durum wheat Gene Pool Based on SDS PAGE and HPLC (SE/RP-HPLC)

Activity 4: Characterization of physicochemical starch traits of Ethiopian durum wheat gene pools based on amylose amylopectin ratio

Activity 5: Development and identification of dense high throughput markers and candidate novel gene in Ethiopian durum wheat gene pools

Completed dissertation activities for year I and II students

Evaluation of Ethiopian Durum wheat landraces under multi-environmental conditions for processing quality traits

Objective: To assess the agro-morphological diversity of Ethiopian durum wheat germplasm with different geographic origins within Ethiopia

MATERIALS AND METHODS

The study area

The field experiment was conducted under field conditions at five locations, namely, Sinana, Kulumsa, Akaki, Holeta and Chafe donsa during the main cropping season of 2019/2020 (Figs. 13-

15). The selected locations represent different agro-ecozones of Ethiopia where durum wheat landraces are grown and differing in their rainfall, temperatures, altitude, soil type and texture.

Plant materials

A total of 420 Ethiopian durum wheat (**385 landraces and 35 released varieties**) representing the major agro-ecozones of the country were collected from Sinana Agricultural Research Center (205 landraces and 10 released varieties), Wollo University (180 landraces) and Bishoftu (DebreZeit) Agricultural Research centers (25 released varieties). These materials are supposed to represent the major agro-ecozones of the country to identify and select major desirable durum wheat quality traits from promising landraces.

The experiment was laid out using Alpha lattice with two replications with plot size of 0.4 m² (2 rows, each 1 m long) with a row to row spacing of 20 cm. The genotypes were assigned to plots randomly within each replication and 41/46 kg ha⁻¹ N/P₂O₅ of fertilizer was applied at planting. All other crop management and protection practices were applied uniformly to all germplasms.



Fig. 13: Clockwise: Holeta, Akaki, Chafe Donsa and Sinana Research Sites

Field performance and advisors' visits

The materials performed well in all respective locations and some of the locations were visited by advisors.



Fig. 14: Clockwise: Filed performance at Holeta, Akaki, Chafe Donsa and Sinana Research Sites

Data collections and Analysis

Data were collected either on plant basis (i.e., from five randomly selected plants) or plot basis according to descriptors of IBPGR (1985) and collected electronically by using Fieldscorer version 2.16 program supported by Lenovo tablets. Kombine software version 2.0.5.0 was used for synchronizations of collected data into personal computers. All necessary data for meeting the objectives set were collected at all locations.

Collected data on plant basis are:-

Collected data on plant basis are:-

- Spike length
- Numbers of spikelet spike
- Plant height and
- Effective tiller number

Collected data on plot basis are:-

- Dates to flowering and maturity,
- Glume color,
- Glume hair,
- Spike density,
- Lodging,
- Stand percent (agronomic score)
- Grain yield per plot,
- Thousand kernel weight(TKW),
- Test weight,
- Kernel color,
- Vitreous and
- Total biomass



Fig. 15: Left: Harvesting and right: laboratory analyses of collected samples at Kulumsa and Holeta site

Data collection and harvesting of the trail were completed. The remaining locations (Akaki, Chafe Donsa and Sinana site) data collection is underway and harvesting will be completed by the end of December, 2019 to Mid-January, 2020.

The phenotypic data collected from all respective locations will be subjected for statistical analysis using R software's, GEA-R, META-R, Genstat and MINTAB version 14 computer packages to analyse different diversity parameters and associate with GWAS. Analysis of the data will be commenced immediately after harvesting of the trail from all location.

Challenges at fieldwork

- 1. The problem of logistics for trail management:** Getting vehicles for fieldwork was challenging. We were handling a seasonal work which will not give time and getting vehicles on need time frame was very difficult. We tried to use rental car, but the finance system were also so challenging.
- 2. Finance facilitation Problem:** The budget for implementing the fieldwork was not released as per my plan and I faced problem at planting and harvesting. The budget was distributed across four year duration which is not conducive for managing my experiment as per my plan. The finance system was very challenging to manage trail on needed time frame because we were not receiving the requested advance as per plan (on needed critical time) and this made difficulty on our work.

Solution made for challenges encountered

1. Rental car was used to tackle the vehicle problems
2. Finance problem were solved by the support of Dr.Kassahun from his project
He supported me from his project during critical time to handle planting and harvesting activities.

Table 6:Future planned Activities

No.	Activities	YearII	Year III	Year IV	Places to handle the activities
1	Molecular studies (GWAS) Analysis, data compiling& analysis	February 2020-July 2020			SLU, Alarp
2	Genetic Diversity analysis using SSR Chips	February 2020-July 2020			SLU, Alarp
3	Manuscript preparation for GWAS and SSR Chips Work	July to October, 2020			AAU, Addis Ababa
4	Grain protein composition		October,2020		SLU, Alarp

No.	Activities	YearII	Year III	Year IV	Places to handle the activities
	analysis data, compiling ,analysis & paper development		to March, 2020		
5	Physicochemical starch traits analysis, data compiling, analysis & paper development		April, 2020 to September, 2020		SLU, Alarp
6	Candidate gene identification and dense high throughput markers development		April, 2020 to September, 2020		SLU, Alarp
7	Manuscript preparation for planned activities of 4-6 and Doctoral Dissertation compiling		September 2020 to April 2021		SLU, Alarp and AAU, Addis Ababa

Summary

Wheat is one of the most important cereal crops used in maintaining food security for humankind. Even though, Ethiopia is considered as center of diversity for durum wheat species and these materials were not exhaustively used in variety development program. The grain protein composition and Physico-chemical starch traits of Ethiopian durum wheat gene pool were not studied so far and these activities were planned to fill this gap. For evaluation of Ethiopian durum gene pool under different geographical areas, a total of 420 (385 landraces and 35 released varieties) were planted at five locations. All important data were collected and harvesting of the trails was not completed yet at Akaki, Chafe donsa and Sinana. Data analysis for phenotypic data collected will be commenced after completion of harvesting from all respective locations.

iv. AdaneGebeyehu- PhD Student—currently at SLU (Sweden)

Project title: Development and use of genomic and transcriptomic tools and resources for *Guizotia abyssinica* (Noug) and analysis of some key traits to promote its improvement and conservation.

PhD Student: AdaneGebeyehuDemissie (ID No. GSR/8348/11)

Advisors: Dr. Mulatu Geleta (Associate Professor, SLU-Department of Plant Breeding) and Dr. Kassahun Tesfaye (Associate Professor, AAU-IOB)

Objectives

General objective

The overall objective of this study is to contribute to the improvement of noug in various desirable traits through developing genomic and transcriptomic tools and resources that can be used for molecular breeding and its efficient conservation, as well as through analysis of factors affecting traits such as oleic acid content in seed oil.

Specific Objectives

1. To determine the variation in seed set of various recently developed self-compatible lines (SC-lines) that have been recently developed and selected the best lines for further breeding
2. Study the effect of temperature and photoperiod on the oleic acid content of noug under greenhouse and in the field conditions
3. Conduct RNA-sequencing, followed by *de novo* transcriptome assembly and differential expression analysis and Functional Annotation and Enrichment for Differentially Expressed Genes
4. Develop SNP and microsatellite markers based on *de novo*-transcriptome sequences for various applications
5. Conduct genetic diversity analysis of Ethiopian noug gene pool using newly developed microsatellite markers to identify genetic diversity hot-spot, determine core set of noug collection at Ethiopian Institute of biodiversity for long term conservation and for use in breeding program
6. Phenotype and genotype a set of diverse noug genotypes through seqSNP approach for genome wide association study (GWAS) of various traits such as self-compatibility, oil content, oil quality, seed color, head size and seed size as well as flower color

Progress so far

- To determine the variation in seed set of various recently developed self-compatible lines (SC-lines) that have been recently developed and selected as the best lines for further breeding, 416 individual plants representing recombinant inbred lines (RIL) were grown in the green house (GH) and transferred to the Biotron with adjusted minimum and ventilation temperature during day (07:00–8:00) was 25°C and 27°C and adjusted minimum and ventilation temperature during night (18:00–07:00) was 21°C and 23°C respectively to

induce flower buds. Plants were kept two months in the biotron, all necessary data was collected and seeds were harvested and ready to be counted very soon. See the images below.



Fig. 16: Greenhouse experiments

- To study the effect of temperature and photoperiod on the oleic acid content of noug under greenhouse conditions, 50 noug landrace populations collected from different altitudes in Ethiopia and 100 individual genotypes that are known to have high, medium and low oleic acid content are grown in the green house using the half-seed approach in which half of each seed is analyzed for oleic acid content and the other half is grown under different temperatures (21°C day & 18°C night and 25°C day & 21°C night) and photoperiod of 11.5 hrs and 10.5 hrs in a Biotron. Then, the seeds produced from controlled crosses among these genotypes will be analyzed for oleic acid content. Plants will be grown in a chamber in a Biotron. The oleic acid content of half-seed is ongoing using GC analysis. See the images below.



Fig. 17: Laboratory experiments on *Guizotia abyssinica* (Noug) described above

- For RNA-sequencing and *de novo*-transcriptome assembly, development of SNP and microsatellite markers, 10 genotypes that are known to have high genetic distance among them were used in 3 replicates. Three genotypes were pooled together for SNP calling and 10 copies of every gene were obtained at the end of sequencing. Sequences will be aligned, and every polymorphism will be identified. Subsequently, transcribed part of the genome will be identified (Transcriptomics). RNA-sequencing was conducted by CD-genomics, USA. RNA extraction was done and sent to CD-genomics, USA, RNA-sequencing is conducted, followed by *de novo* transcriptome assembly and differential expression analysis and Functional Annotation and Enrichment for Differentially Expressed Genes. RNAseq data analysis underway. See the images below.



Fig. 18: Seedlings development

Future Plan 2020/2021

1. Develop SNP and microsatellite markers based on *de novotranscriptome* sequences for various applications.
2. Conduct genetic diversity analysis of Ethiopian noug gene pool using newly developed microsatellite markers to identify genetic diversity hot-spot, determine core set of noug collection at Ethiopian Institute of biodiversity for long term conservation and for use in breeding program.
3. Phenotype and genotype a set of diverse noug genotypes through seqSNP approach for genome wide association study (GWAS) of various traits such as self-compatibility, oil content, oil quality, seed color, head size and seed size as well as flower color **to be carried out in 2021.**
4. Studying variation in seed sets of SC-lines in the field (Holeta, Bishoftu (Debre Zeit) and Melkassa ARCs) **to be carried out in 2021.**

5. Study the effect of temperature on the oleic acid content of noug under field conditions in Holeta, Bishoftu (DebreZeit) and Melkassa ARCs **to be carried out in 2021.**

v. MisteruTesfaye: PhD Student currently at SLU (Sweden)

Project title: Improving oilseeds qualities and quantities in Ethiopian mustard (*Brassica carinata*) for either food and industrial applications

Sub-project: Integrating the plant genomics with conventional breeding to enhance the quality and productivity of major crops in Ethiopia

Supervisors: Prof. Li-Hua Zhu, SLU, Sweden and Dr. Tileye Feyissa, AAU, Ethiopia

Introduction

This report is prepared upon request of AAU-SIDA project progress report for which I have been part of the project as a PhD student. According to the work plan indicated in the proposal for *Brassica carinata* quality improvement project, the majority of laboratory experiments that are related to gene modification would be conducted at Swedish University of Agricultural Science. The target traits for the first cycle of the study are erucic acid and wax ester synthesis for which constructs has already prepared. The first construct contains three genes responsible for erucic acid (**Pwatergate-FAD2-LPAAT-KCS-2 (3 genes) in AGL1**)) while the second construct is for wax ester synthesis (**pBinGlyRed-FWS3 inAGL1 (no KCS)**). So far five batches *in vitro* experiments have been conducted for both constructs. In addition to the lab work, I have started to attend courses which are relevant for the field study for the fulfillment of Licentiate Degree. I have also participated in the journal club as well as group meeting which usually scheduled per month and twice a month, respectively. In this report, I tried to present the progress of my research activities in terms of major activities accomplished, intermediate outputs, the challenges and future plans for the next 6 months.

Major tasks accomplished

1.1 Oil content determination

The oil content of those 36 genotypes phenotypically characterized using FOSS Soxtee 8000 instrument following the steps illustrated in Figure 1. Although the oil content was previously analyzed using NMR, the data seems to have an error due to improper calibration. According to the analysis the mean value of oil content was 41.28 % with 49.92 % and 34.26% maximum and minimum value, respectively. Seven genotypes scored > 44% oil content (which is the maximum

oil content of the existing *B. carinata*). These genotypes are thus can be selected for high oil content. See images below.



Fig. 19: Left to right: Extracted of crude oil, refluxing of crude oil and extraction with n-hexane



Fig. 20: Left to right: Left to right: Drying with anhydrous Na_2SO_4 , Filtration and Concentrating by rotavapour

1.2 Protein content determination

One of the specific objectives of *B. carinata* project is to develop lines with good meal quality mainly for low glucosinolates. Low glucosinolate parameter should be accompanied with high protein content. In line of this, the protein content of 36 genotypes were analyzed using Kjeldahn method for determination of nitrogen content and multiplied the value with correction factor 6.25 (correction factor set for oilseeds by AOCS (Fig. 21). The other parameter that should be given consideration for meal is protein content.



Fig. 21: Sample preparations: Clockwise: Digestion, distillation, titration and Nitrogen content determination of *B. carinata* using Kjeldahl method

According to the lab analysis record, the average protein content of 36 *B. carinata* genotypes was 22.80 %. The maximum and minimum protein content was 27.76% and 13.78 %, respectively.

1.3 Fatty acid profile

Another important parameter analyzed for the 36 genotypes was fatty acid profile using the Gas Chromatography (Agilent, GC-7890A) as illustrated in figure 3. Three major tasks were carried out: (i) sample preparation, (ii) running GC using FID (iii) acquisition of data.

Nine types of fatty acids were analyzed for each 36 *B. carinata* genotypes. Among these, the maximum, minimum and average value the major fatty acids is presented in Table 7, below.

Table 7: Values of fatty acids of 36 *B. carinata* genotypes

Fatty acids profile	Maximum value, %	Minimum value, %	Average, %
Palmitic	3.05	2.12	2.77
Stearic	1.43	0.96	1.21
Oleic	10.09	5.93	8.32
Linoleic	20.93	14.66	17.62

1.3 Collection of spectra data for calibration

Near -Infrared Spectroscopy (NIRS) is the non-destructive methods of analyzing organic compounds using the near-infrared region (780-2500nm) of the electromagnetic spectrum. This enables to analyze multiple traits of large sets of samples with short period of time and minor error. The analysis, however, requires calibration equation using both spectra data and the wet chemistry data. In line of this, spectra data were collected for 360 different *B. carinata* genotypes for future development of prediction model. This prediction model is used to analyze the quality traits such as erucic acid and glucosinolates by passing the laboratory reference methods. The reflectance spectra of 360 *B. carinata* genotypes were collected using NIRS instrument (Tango-Bruker FT-NIR) Fig. 22, below.



Fig. 22: Spectra collection of *B. carinata* samples using Tango-Bruker FT-NIR

The individual spectra of 360 *B. carinata* genotypes including the 36 genotypes data have already documented for future development of calibration curve. The aggregate spectra data for all of the 360 genotypes is presented in Fig. 23.

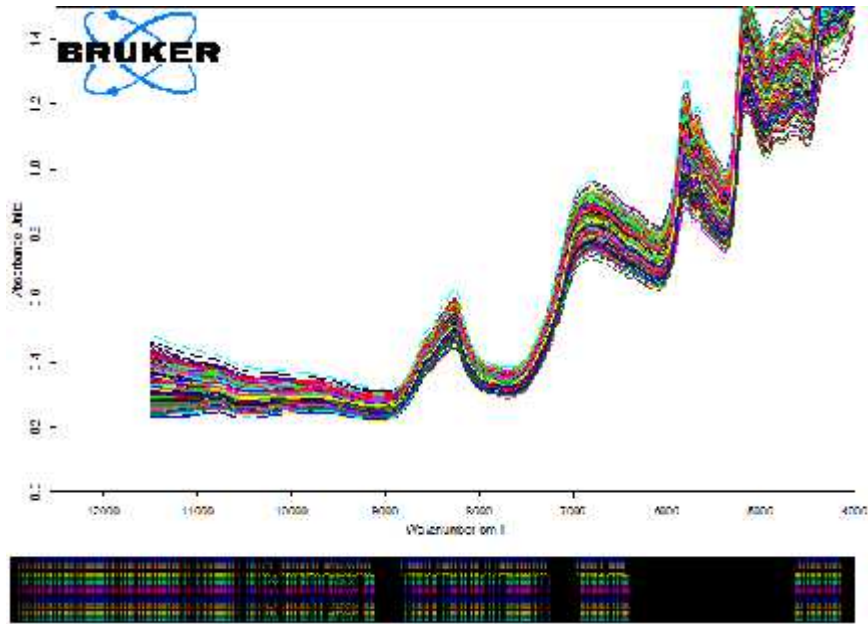


Fig. 23: Aggregate spectradata of *B. carinata* genotypes collected using Tango-Bruker FT-NIR



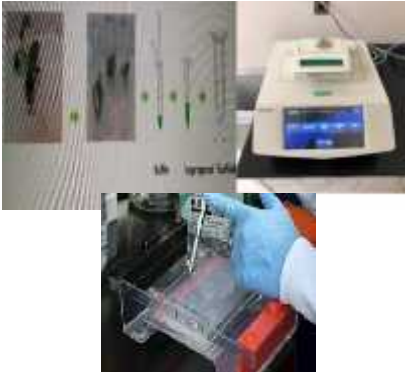
1.4. Transformation of *B. carinata*

The major lab experiments that I have carried out under this sub objective are transformation experiments of two constructs that contains genes responsible for erucic acid and wax ester. Here I summarized the work in terms of activity, treatments, inputs (treatment and media/chemicals) used and the estimated time required for each activity (Table 8)

i. Major lab activities conducted for *B. carinata* transformation experiment

Table 8: Major lab activities conducted for *B. carinata* transformation experiment

Activities	Treatments	Inputs (treatments, explants, media, chemicals etc.)	Period required till next step
<p>1. Seed germination</p> 	<p>Derash Pedigree: S-67XHoletta-1/7/2/14/2/28/2</p>	<p>MS 20 (S) Sucrose (20g/l), MS= 4.9g/l and Gerlite= 2.5g/l</p>	<p>5 days</p>
<p>1. Pre-culture</p> 	<p>Hypocotyl</p>	<p>MS20 (S) Sucrose : 20g/l MS: 4.9g/l PGRs (2mg/l BAP + 0.1mg/l NAA)</p>	<p>2 days till co-culture</p>
<p>2. Coculture</p> 	<p>Pre-cultured hypocotyl</p>	<p>MS20 (S) Sucrose : 20g/l MS: 4.9g/l PGRs (2mg/l BAP + 0.1mg/l NAA)</p>	<p>2 days</p>

Activities	Treatments	Inputs (treatments, explants, media, chemicals etc.)	Period required till next step
<p>3. Regeneration in selective media</p> 	<p>Well-developed explants</p>	<p>CIMs25 MS20 (S) Sucrose : 20g/l MS: 4.9g/l PGRs (2mg/l BAP + 0.1mg/l NAA) Antibiotics Kanamycine= 25mg/l Ticarillin 150mg/l</p>	<p>2 -4 weeks till well developed shoots found</p>
<p>4. Shoot elongation</p> 	<p>Well- developed healthy shoots</p>	<p>MS (S) with Bacto-agar Antibiotics Kanamycine= 25-30mg/l Cefotaxime 100-200mg/l</p>	<p>2 weeks</p>
<p>5. Preliminary screening of transformants (DNA extraction, PCR and gel electrophoresis)</p> 	<p>Leaf, DNA</p>	<p>200mMTris,250mMNaCl, 25mMEDTA &0.5% SDS) Taq polymerize Loading dye or buffer Primers dNTPs</p>	<p>Depends of the number of samples (estimated 2 weeks)</p>

ii. Intermediate outputs of the experiments

One *in vitro* experiment output: Five batches transformation experiments have been conducted for the last four months. This experiment follows the work flow stated above. In

average 120 hypocotyl explants co-cultured in 10-15ml *Agrobacterium* solutions. After two days, the transformed organocalli transferred to selection regeneration media having the appropriate antibiotics. The explant sub-clustered every two weeks till form shoots. Shoots then transferred to media in the Magenta box which contains bacto-agar, cefotaxime and kanamycin. The number of shoots grown in the box for the two construct is presented in Table 9 and some of the shoots grown illustrated in the Figs.24 and 25, below.

Table 9: Number of regenerants of transformed explants in *B. carnata*(NOTE: The number of explants transferred may vary and thus number does not imply regeneration efficiency)

Experiment cycles	Constructs		Total
	Wax ester	Erucic acid	
1 st Batch	19	20	39
2 nd Batch	25	25	50
3 rd Batch	20	18	38
4 th Batch	20	20	40
5 th Batch	18	18	36



Fig. 24: Left: Regenerants of erucic acid construct and Right: wax ester

Although it was possible to get a number of regenerants from each constructs, some showed of them showed chimeric and thus could not be possible transformants. Based on the currentscreeningusingNPT II gene (Kanamcine), it was possible to identify 5 transformants for wax ester and only twoforerucic acid as illustrated in the gel diagram, below.

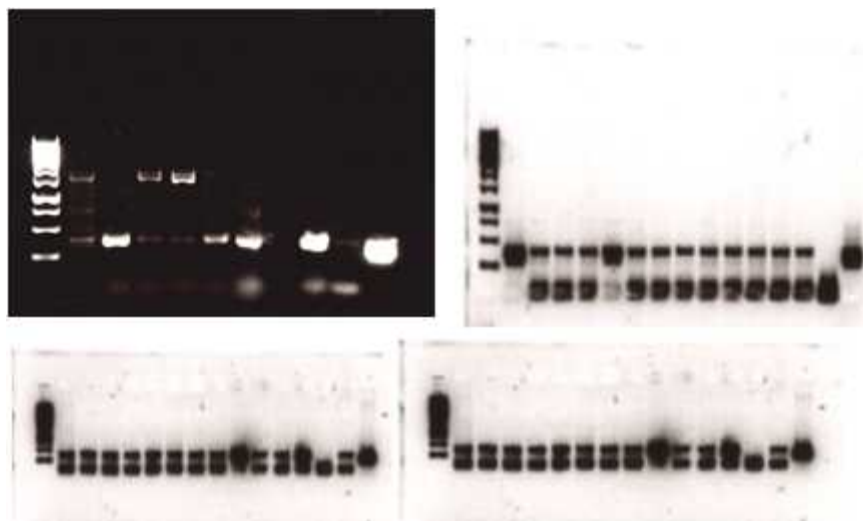


Fig. 25: Polymerase chain reaction analysis of putative transgenic plants of *B. carinata*: Clockwise: Wax ester +ve (Lane 8), Wax ester +ve (Lane 1 and Lane 5), wax ester +ve (Lane 9 and 12), and Ericic acid +ve (Lane 9 and 12).

In addition to the above, currently new sets of experiments have been initiated to test the selection pressure of the antibiotics (i.e Kanamycin) under different concentrations. The concentrations of kanamycin are 25, 50, 75 and 100 mg/L which would be tested after co-culture.

ii. Two Course attendance

The student has completed the course entitled “**Accelerating climate resilient plant breeding by applying -omics and artificial intelligence**”. The course has been given for one week with practical sessions especially the use of “**MOFI**” and “**MapMan**” for analysis of omics data. Besides, experts have been invited and presented their practical sessions during the course. The course was 3 credit course and certificate awarded for my participation.

2. Challenges during the implementation of project activities

There is no as such critical challenge during the implementation of the project. The following are some of threats encountered during the implementation of the project

- i) Lack of standards for analysis of glucosinolates: It was not possible to get standards to analyze glucosinolates for applying HPLC.

Measures taken: Efforts have been done to analyze glucosinolates using direct stoichiometric calculations using the content of sulfur and nitrogen as described by Schnug and Henekalus (1990). According to this author total glucosinolates in seeds of *Brassica species* directly related to the total sulfur and nitrogen concentration. Based on this literature, total sulfur content have already determined and thus using the nitrogen that has already found for protein determination, I will try to develop algorithm using the relationships between sulfur and nitrogen

- ii) Some consumables such as helium gas as a carrier for GC as well as column for HPLC could be easily available in the market.

Measures taken: Search of other sources and it was possible to find in-kind support from other labs especially for helium gas.

- iii. In Sweden, except COVID-19, which is actually a global challenge, that makes some gaps in handling some batches of the experiment, I do not face any difficult situation beyond my control while conducting the research activities. This is due to the fact that the continuous follow up and support of my supervisors and the research team members of the lab where I am working and the plant breeding department of SLU.

3. Future plan

It is obvious that the transformation work will continue till possible to get transgenic plant of the desired traits with final target of optimum protocol of transformation of *B. carinata*. This requires additional time and thus requesting extension of time of stay at SLU need to be the first task to be accomplished. During the stay of the next 6 months the following duties will be carried out which could be reviewed accordingly in consultation with my supervisors.

- Screening of transgenic plants from the transformation experiment conducted so far
- Conducting antibiotics selection pressure experiment
- Attending courses which are relevant to the field of study
- Draft of paper for transformation protocol for *B. carinata*
- Plan of CRISPR/Cas9 experiment

2. Sub project 2

Subproject 2.1. FantayeAyele, PhD Student

Project title: “Effects of phyto-beneficial soil microbes on abiotic stress tolerance and nutrients uptake of finger millet (*Eleusine coracana* (L.) Gaertn) and sorghum (*Sorghum bicolor* (L) Moench) under low input sustainable agriculture”

Supervisor: Dr. Salme Timmusk, Professor Rodomiro Ortiz, Dr. Diriba Muleta and Dr. Kassahun Tesfaye (PhD)

Background

Ethiopia is an agricultural country where farmers produce different cereal crops and different wild grasses are also there with for grazing. Among the cereal crops and wild grasses that are widely grown in the country, finger millet and sorghum and their wild relatives are one. Finger millet and sorghum grows most in stressed and food unsecured parts of the country where other crops failed to survive. They are important staple crops during harsh environment. Most of the crop improvement strategies are directed toward staple cereals such as rice, wheat, maize etc., whereas attention on climate-resilient cereals such as finger millet and sorghum is limited lags far behind. Hence, greater unpredictability of weather conditions under climate change makes it clear that plant breeding alone is not able to meet challenges and calls for strategies completing phenotypic plasticity and adaptability without curtailing yield potential. To reduce the harmful effects of the conventional methods of agriculture; the innovative schemes, based on the use of native microbiome associated with crops is an alternative for addressing many challenges that climate change poses to soil health and agricultural productivity.

It is known that plant-associated microorganisms evolve with the host, play significant roles in contribute to plant nutrition and environmental adaptation. However, the cultivability of the microbial communities and isolation of novel plant beneficial microbes is lagging very much behind. Isolation and screening for known traits for plant growth promotion by axenic cultures, may neglect dominant microbial groups associated to plants which might restrict the mechanisms of cross-referencing with data from culture-independent community analysis. In recent years, the development of next-generation sequencing (NGS) technologies has permitted in-depth

sequencing and data analyses of various types of environmental samples at a deeper level than possible with standard molecular biological techniques.

A community-based culture collection (CBC) is an approach used for isolation of microbes at community level, for identifying and investigating a representative set of the microbe associated with different organs of the host plant. CBC is conducted by isolation of communities instead of axenic colonies from the host plant organ. As this method can allow large-scale isolation and identification of microbes (Armanhi *et al.*, 2016), it is useful to recover larger fractions of microbiota from a given environment to preserve putative microbe-microbe interactions.

Objectives of the research

- (i) To collect plant samples from finger millet and sorghum and their wild relatives and of brachypodium from different regions of Ethiopia.
- (ii) To prepare samples for construction of a community-based culture collection (culture-dependent) and for direct DNA extraction (for the culture-independent techniques).
- (iii) To identify representatives of highly abundant bacteria from rhizosphere, and root core microbiomes.
- (iv) To screen for the microbiome potential to confer plant benefits and select for the molecular traits with the ability to mitigate abiotic and biotic stress
- (v) To assemble a synthetic community used as an inoculants and Field testing, evaluation of microbial inoculants.
- (vi) To preserve recognized microbial traits from microbe-microbe interaction, based on microbial community profile from harsh and moderate environments in Ethiopia,

Activities carried out so far

Field survey was done in Aug, 2019 and sample collection was done from October-December, 2019. A total of 270 samples were collected from mature finger millet and sorghum and their wild relatives and brachypodium, rhizosphere and bulk soil and roots from 7 regional states of Ethiopia; Oromia regional state (Jimma, Eastern and Western Wollega zones), Benshangul-Gumuz regional state (Assosa and metekel zone), Tigray regional state (Eastern and Central Tigray zone), Afar regional state (Asayita zone) Amhara regional state (North wollo zone) and Ethio-somali regional state (fafan and Jerer zone) and southern region (Kaffa and Gurage zone). For each of the locations three woredas were selected, with two kebele for each woreda. Roots, rhizosphere and bulk soil samples of finger

millet and sorghum and their wild relatives from two plants per farm, were collected, by piercing the soil with a shovel to a depth of 30 cm to cut any of the lateral roots holding the plant in the soil. The plant roots were excavated by leveraging the shovel and the root ball was placed in the bucket labeled with the information about the plant material to be sampled. The aboveground plant biomass was cut off from the excavated root ball and was discarded. Stir

The bulk soil removed from the root were mixed, freed of debris and placed into a labeled, 17.7 x 19.5 cm zipper storage bag and were placed in the ice box with ice. Root and rhizosphere sample were obtained; by cutting 6, 12 cm long roots per plant with sterilized pruning scissors. The excised roots were placed in a labeled 50 mL tube containing 35 mL of autoclaved, phosphate buffer (pH = 6.5, 200 μ L/L surfactant). The tubes were minced for 2 min and rhizosphere soil was released of the roots. Then, the root sample was removed from the tube with sterilized forceps, blotted briefly on the paper towels, and placed in a new, labeled 50 mL tube Both the tubes containing the rhizosphere and the one containing roots were placed on ice.



Fig. 26: Sample collection in the field

Processing Rhizosphere samples for bacterial community isolation and DNA extraction: -

Rhizosphere samples from the field were re-suspended by shaking the tubes and filtered into a new 50 mL tube using 100- μ m-mesh, and centrifuged at 3000 x g for 5 min at room temperature. The supernatant was discarded; 1.5 mL of sterile phosphate buffer (without surfactant) was added to rhizosphere pellets, vortexed and placed on ice. The suspended liquid was pipetted into a clean, labeled, 2 mL microfuge tube and centrifuged at 15,871 x g for 2 min at room temperature. Then, the

supernatant were immediately poured off and the tubes were drained on clean paper towels, and the pellets were stored at -80 °C.

Processing soil samples for DNA extraction, bacterial community isolation, soil analysis and soil moisture test: - By avoiding any small root pieces and debris, approximately 3 g of soil were filled in a clean, labeled 2 mL tube for DNA extraction and 10 g of soil were sated aside in separate plastic bag for bacterial community isolation using a sterile metal spatula and stored at -20 °C for DNA extraction. Soil sample brought from the field were manually sieved through 200nm and 400nm stacked sieves, larger sieve on top of the smaller sieve on a clean wash pan. And 100 to 125 g of sieved soil were sated aside in a 17.7 x 19.5 cm zippered bag and stored at 4 °C for future soil physicochemical and texture analysis. Measure 40 to 45 g of sieved soil into the brown paper bag of known weight and the bags were placed in a drying oven sated at 55 - 60 °C for 72 hours and allowed to cool before recording the weight of the soil to calculate the percentage of soil moisture for each sample.

Processing root samples for isolation of endophyte bacterial community and DNA extraction: - 50mL root tubes, collected in the field were sterilized by adding 35 mL of 50% bleach + 0.01% Tween 20 shaking for 30 to 60 seconds and the bleach was poured off then, 35 mL of 70% EtOH was added and minced for another 30 to 60 seconds and 70% EtOH was poured off and 35 mL of sterile, ultrapure water was added and minced for 1 minute. The water wash were repeated for two more times. Sterilized roots were dried on a clean paper towel. Then, the sterilized root pieces were validated for disinfection process, by adding 100 µL of the third rinse onto tryptic soy agar (TSA) plates, and incubated for three days and confirmed for no bacterial communities' growth. The disinfected samples were ground with a sterilized mortar and pestle and then incubated in PBS buffer for 2 h. The tissue incubations were filtered through four layers of gauze to remove the residuals. After centrifugation, the microbial pellets were harvested as endophytes and stored at -80 °C. Since March, our laboratory is occupied with COVID tests and other analyses are not allowed there, but the samples were preserved properly and waiting for analysis after everything gets ok with the pandemic.

Remaining activities

So far two of the six objectives are more or less achieved accounting for about 15% of the planned activities. Except collection of plant samples from finger millet and sorghum and their wild relatives

and of brachypodium from different regions of Ethiopia and preparation of samples for construction of a community-based culture collection (culture-dependent) and for direct DNA extraction (for the culture-independent techniques) which have already been completed in EBTi lab. All the other parts of the last four objectives are not performed. Therefore, what remains to be done is addressing the 3th 4th and 5th objective to be performed in Sweden, involving DNA extraction, identification of representatives of highly abundant bacteria from rhizosphere, and root core microbiomes, screening potential microbiome to confer plant benefits and select for the molecular traits with the ability to mitigate abiotic and biotic stress, assembling a synthetic community used as an inoculants for pot and field experiment for evaluation of microbial inoculants. And the remaining activity, preserving recognized microbial traits from microbe-microbe interaction, based on microbial community profile from harsh and moderate environments in Ethiopia. This will require waiting for, field experiment to be performed in Ethiopia. Once this work is completed data analysis and total write up of the thesis will be started. Finally the work plan is revised according to the current situation.

Table 10: Time table for the remaining activities

No.	Activities	2020											
		J	F	M	A	M	J	J	A	S	O	N	D
1	Bacterial isolation								X	X	X	X	
2	Soil analysis										X	X	X
2021													
No.	Activities	J	F	M	A	M	J	J	A	S	O	N	D
1	DNA Extraction	X	X										
2	Colony identification by NGS			X	X								
3	Test for desired traits					X	X	X					
4	Test for antagonistic activity									X	X	X	
2	Cross-referencing and data analysis								X	X	X	X	X
3	Preparation of inoculums											X	X
2022													
No.	Activities	J	F	M	A	M	J	J	A	S	O	N	D
5	Plant performance Examination								X	X	X	X	X
2023													
No.	Activities	J	F	M	A	M	J	J	A	S	O	N	D
1	Field confirmation	X	X	X	X	X							

2	Data compiling	x	x	x	x	x				
3	Data analysis						x	X	x	x
4	Writing							X	x	x
5	Finalizing									x x

Sub project 3

1. Wondimagegne Bekele, PhD Student

Project title: Locally available feed resources and their potential effect on abatement of methane emission

Supervisors: Dr. Abiy Zegeye (IoB, AAU); Prof. Pekka Huhtanen (SLU, Sweden)

Part I: Year 1 Annual Report (2019)

This report is in response to your request to produce a report of activity for the year 2019. For your information most of year 2019 activities is geared towards taking course work that is mandatory for PhD in Agriculture Biotechnology. I will present the progress report in to three section that are composed of

- i. Course work
- ii. Training that I have participated
- iii. Project update

Section I- Course work: Since registering into the department, we have obliged to take mandatory and elective course that will help us to capacitate and equipped to undertake PhD work. Here under I will present the course work I have so far taken in the said year.

1. Advanced molecular biology
2. Genomic, transcriptomics, and metabolomics
3. Molecular plant breeding
4. Advanced Bioinformatics course

Although I have finished Advanced Bioinformatics course, it has not yet graded and finalized. But the other course so far, I have taken is well accomplished. In addition, I had been collected materials that help me to write seminar I and II.

Section ii: Trainings, workshops and meetings

Under this section, the progress memo will give you the highlight of training, workshop and meeting so far, I have participated.

- 1. Second annual planning meeting at the Embassy of Sweden:** This meeting was invited by the ambassador of Sweden. The ambassador imparted us the bi-lateral relationship of Ethiopia and Sweden, the development work the Sweden government so far implemented in Ethiopia and AAU-SLU project.
- 2. Bioinformatics training:** Two weeks training was organized by AAU and Ebti in collaboration with university of Calgary, Canada. I have the opportunity to participate this training. The training gave me an insight on the application of bioinformatics to metagenomics. After finalizing the training, I was awarded certificate of participation.
- 3. Workshop in the area of waste water treatment using biotechnological tool:** We were invited by the institute to participate a workshop that aimed waste water treatment using biotechnological tool. The workshop was organized by Ethiopia science academy. It was fruit full workshop how biotechnology could serve us a solution to treat waste water.
- 4. Ethiopia Bioinformatics user group:** After having participated two weeks training on bioinformatics, volunteers of the trainee were agreed to present new bioinformatics tools and share information monthly at Ebti. I have the chance to present on the first meeting about metagenomics and day one activity of the training.

Section iii Project update: Since assigning to this project, I was spent most of my time on searching and collecting materials that could help me in proposal development. Although I have accomplished developing the proposal, the project title should be changed to 'Potential locally available feed resource as methane emissions abatement in the diet of indigenous sheep in Ethiopia' so as to be clear about the work. I have also developed and implemented questionnaire at the project sight as part of the project. Based on the questionnaire I have partly collected feed on the said year.

Part II: Mid-year Report (2020)

Course work: PhD student has successfully completed all instructional courses. Two seminars were interrupted due to COVID-19 outbreak, but are anticipated to be held sometime this summer (2020).

Research Proposal: A final research proposal was developed, after making modifications and adjustments to accommodate existing situations and realities, and to fit the project with the anticipated PhD program time frame.

Sample collection: Based on the questionnaire survey information, feed samples were collected from DebreBerhanand Showa Robit areas. The quantities of feed samples collected are sufficient to perform composite analysis and *in vitro* digestion in replicates.

Sample preparation: Collected feed samples were air dried and packaged individually, making the sample appropriate for packaging for further need. The collected feed samples were ground as required for *in vitro* and *in situ* parameter analysis.

Follow-up: In addition, further group discussion was held on the desirability and abundance of the collected feed to ascertain their eventual usability.

During collection, feed samples were identified using their local names. It was necessary to obtain and ascertain the scientific species names. To this effect, preparations were made to consult the National Herbarium (located on Arat kilo campus), however, no progress was made in this regard since the herbarium was soon closed due to the COVID-19 outbreak.

Travel to Sweden: Travel of PhD student to Sweden was planned for April 2020. However, travel restrictions imposed due to the pandemic has caused the postponement of the travel with no definite end date.

Anticipated risks: The COVID-19 outbreak is the one single factor that has caused disruptions in terms of the progress of the project in a timely manner. As of today, Ethiopia is experiencing an increased rate of infections which is expected to the conduct of business-as-usual for the foreseeable future. The project activities expected to be impacted are, but not necessarily limited to:

- PhD student's study/research visit to Sweden
- Performing chemical composite analysis of feed samples
- Species identification of feed samples

Co-advisor at Umea University, Prof. Pekka Huhtanen, was on partial retirement and is now moving to Finland. This is further complicated by his post-doc, Dr. Mohammad Rammin, who was expected

to oversee most of the lab work, is moving to Penn State University (USA) for a one-year visit. The absence of both will pose a challenge to the lab work (particularly the *in vitro* assay) that was expected to be done at Umea University. Alternate arrangements are being sought.



Fig. 27: Project activities from discussions to sample collections

4. SP4: Novel Biocatalysts from Extremophiles – Field work

PhD students: Oliyad Jeilu and Ms. Senait Leyikun

i. **Oliyad Jeilu:** PhD student currently at SLU, Sweden

Project title: Search for new enzymes from alkaline and halo alkaline environment through metagenomics

- Completed course work
- Proposal developed and ready for defense
- Sample site visit, sampling design and collection has been done

- Metagenomic DNA extraction has optimized and a number of metagenomicDNA have been extracted from three soda lakes
- Will travel to Alnarp, Sweden next February for metagenomic library construction and screening

Sample Collection: Soil and water samples collected from the Soda lakes of Ethiopia namely Abijata, Shala, Chitu. The samples are collected at three different times from February 2018 to October 2019.

Processing the collected samples (IOB, AAU, Ethiopia) the collected are processed before proceeding to the DNA extraction just after the collection.

Enrichment of Samples (IOB, AAU, and Ethiopia) Enrichment of the selected samples has been undertaken.

Optimizing DNA extraction (IOB, AAU, Ethiopia) The DNA extraction process separately for sediment and lake water sample optimized between February 2018 to June 2019.

DNA extraction(Both at IOB and SLU) The DNA extraction has been undertaken from the collected samples at AAU, Ethiopia, and SLU, Sweden.

DNA purification (SLU) The extracted DNA samples are purified using appropriate methods.

16S/ITS metagenomics sequencing (SLU) DNA samples are sent for targeted metagenomics sequencing to study microbial profile.

Metagenomics library construction (SLU) Currently, the metagenomic library construction using the fosmid cloning vector is in process. Plan 1.Finishing the library construction 2. Screening the libraries for targeted enzymes

Ms. SenaitLeykun, PhD student

Project title: Thermoalkalostable microbial lipases: isolation, characterization, and evaluation of their potential applications

Activities performed so far

- i. Completing course work
- ii. Proposal developed and ready for defense

iii. Sample site visit, sampling design and collection has been done

Cultivation, enzyme isolation and production conditions optimized: So far more 300 pure isolates screened for lipase activity. About 6 positive isolates with good lipase activity are obtained and the production and assay conditions are being optimized. At the moment methods for getting maximum enzyme production is being optimized.

Isolation and screening: Regarding the progress of lab work, so far about a total of 312 microbe's thermophilic microbes was isolated from hot spring sample with olive oil as a carbon source at 60°C. From which 24 of the isolates were positive in the primary screening (Rhodamine olive oil test) with the formation of orange fluorescent in the microbial growing zone as showed in the Fig.28.



Fig. 28: Extracellular lipase producer that showed orange fluorescence under UV light observation in Rhodamine b dye containing olive oil agar plate

From thus 8 of the isolates were positive for extracellular lipase production in submerged fermentation tested with pNPP lipase assay at 65°C.

The positive ones selected based on pNNPhydrolysis ability by realizing nitrophenol yellowish color as showed in figure 2.

The positive ones selected based on pNNPhydrolysis ability by realizing nitrophenol yellowish color as showed in Fig. 29.



Fig. 29: Isolates that showed lipase activity in pNPP assay at 65°C

Evaluation of the enzyme thermo-stability: The selected isolates from primary screening were evaluated based on:

- I. the activity and stability of the enzyme at the Temperature values above 60oC
- II. And their productivity of lipase enzyme
- III. The effect of metal ion the activity of lipase
- IV. Effect of ionic strength on lipase activity were evaluated

Based on this procedure two of the isolates were selected basically on their thermo-stable enzymes and the level of production

The lipase from thus isolates needs Calcium ions for thermal stability and activity

Develop a method for the concentration of the enzyme:Lipase from the two isolates were fractionated at different concentration of ammonium sulphate saturation followed by dialysis and also cold acetone precipitation were done and showed loss of some of lipase activity based on this followed ammonium sulfate concentration for further processing of enzymes

Then subsequent evaluation of partially purified enzymes in comparison with the crude enzyme were optimized

- The effect of ammonium sulfate precipitation on thermal stability of enzymes at different temperature
- The effect of effector on the stability of precipitated enzyme
- The effect of organic solvent (ethanol, acetone, methanol and hexane) were tested on the stability of lipase at 25% saturation with 30 min incubation of enzyme

Based on this the enzyme showed stability in this organic solvent by retaining almost above 70% of their activity

Currently I am trying to develop an immobilization protocol for the precipitated enzyme so that olive oil hydrolysis can be carried out continuously in a column.

Berhanu Worabo, PhD Student

Project Title: Discovery of Novel Alkaline and Thermo-stable Enzymes from Hot Springs of the Ethiopian Rift Valley through Metagenomics

Supervisors: Dr. Amare Gessesse, Dr. Addis Simachew both from Addis Ababa University, Professor Eva Johansson, Dr. Erik Alexandersson and Dr. Aakash Chawadeall from SLU

Table 11: Short summary of my progress report

S. No.	Time Frame	Major Activities	Remark
1.	Nov 2018 – Oct 2019	<ul style="list-style-type: none"> - Admitted to PhD program - Following PhD classes and course work - Attending seminars, training @EBTi and AAUIOB. 	Still some courses are left not accomplished yet
2.	Nov. 2019 Feb. 2020	<p>Proposal write up</p> <ul style="list-style-type: none"> - Collection and Compiling of all necessary E-books, articles, and journals for proposal; - intensive reading - Proposal write up - Taking comments from Ethiopian supervisors <p>Preparation for sample collection</p> <ul style="list-style-type: none"> - Issuing permission and memorandum of understanding - Preparation of materials for sample collection <p>Sample collection</p> <ul style="list-style-type: none"> - Water and sediment sample collection from hot springs around lake Shala and Lake Chitu - Onsite measurement of physical parameters 	<ul style="list-style-type: none"> - Reference management - Lack of equipments to bring hot spring water samples without losing its original temperature; - Representative sampling;
3.	Mid Feb	Commencement of preliminary lab works	-absence of DNA
	2020 - End of March 2020	<ul style="list-style-type: none"> - Hot spring water sample filtration (0.22µm) - DNA extraction - Optimization of DNA extraction protocols - Taking Gel doc pic and Nadrop measurements 	extraction & purification kits - lack of chemicals- - absence of Nanodrop & functional Gel doc
4.	April 2020- till now	<ul style="list-style-type: none"> - No lab progress; joined family - Writing of PhD seminar II - Collection and compiling of journal articles, and eBooks related with my PhD thesis 	-lock down of AAU due o Covid-19 - absence of internet access, lack of electricity power etc.

On Date 17/02/2020- we went to field for sample collection. The group led by Dr. Addis Simachew consisting of 3 PhD students, Birhanu W., Dessie Y., and Senait L. and Research assistant Solomon E.

I have collected water and sediment samples from hot springs around Soda Lakes, Lake Shala and Chitu. Parameters measured on site of sampling

- PH, Temperature and GPS In order to make representative sampling, I took water samples from hot spring in Lake Shala from 3 different locations. SHL1- Shala Hot springs Location 1- Origin of the hot spring(geyser) SHL2-Shala Hot spring Location 2- Downstream to origin 20m away, free flowing hot spring water. SHL3- Shala Hot springs Location 3- 2nd Origin of the hot spring (geyser) -100 away downward sides to 1st origin. CHS -Chitu Hot spring, located around Lake Chitu, only one in number.
- Sediment samples were collected from the two lakes hot spring in clear and autoclaved plastic bags and were stored in ice box then stored at -20°C until further use.
- Hot spring water samples were kept in large volume thermoflask, and sampling bottles before reaching to lab in order to maintain the temperature of samples

Table 12: Temperature of samples

S. No.	Sample Location	pH	Temp.	GPS			Amount of sample collected (l)	Max. amount sample filtered (l)
				Elevation (masl)	North	East		
1.	SHL1	8.93	95 °C	1555	07°28.688'	038°38.102'	20	1.31
2.	SHL2	8.75	62 °C	1552	07°28.672'	038°38.110'	20	7.83
3.	SHL3	8.91	94 °C	1550	07°28.682'	038°38.115'	20	2.0
4.	CHS	8.33	60 °C	1554	07°24.204'	038°25.452'	40	12.35

- Hot spring water samples were filtered by using vacuum filterer. Water sample is allowed to pass through a 0.2µ, 47mm GE water and process technologies Polycarbonate filter paper.
- a 0.2µ polycarbonate filter paper was aseptically removed from vacuum filterer carefully deposited in to autoclaved /clean 1.5ml Eppendorf tubes/
- The tubes are stored at -20 OC until further use, DNA extraction For optimization of DNA extraction process, three samples from each sampling site were randomly taken and DNA was extracted using standard CTAB/Phenol extraction method.
- The following results were recorded:

Table 13: Nanodrop measurements

S.No.	Sample	Amount of water sample used/ 0.2 μ filter paper	Nanodrop 2000/2500C, model					
			concentration	A ₂₆₀	A ₂₈₀	A _{260/A280}	A _{260/230}	Factor
1.	SHI.2	500ml	300.8 ng/ μ l	6.017	3.208	1.88	2.99	50
2.	SHI.3	500ml	81.2 ng/ μ l	1.624	1.027	1.58	0.97	50
3.	CHS	500ml	452.9 ng/ μ l	9.058	5.344	1.70	1.02	50

Short term Plan

- To resume lab as soon as possible if Covid 19 situation at Addis Ababa gets better or any other better option is sought.
- Optimization of DNA Extraction protocols, DNA Purification
- Travelling to Sweden for lab work ;
- Need practical training on certain metagenomic procedures

Long term Plan:

- To continue research activities as per my proposal with the consent of my supervisors.

Sub Project 5**TadeleAseefa, PhD Student**

Project title: Pilot-scale treatment of textile wastewater (SP5-1)

Here are some of the major activities that have been undertaken so far even if we are in the COVID-19 scenario. I have completed the 1st semester (from October 2019 to February 2020) courses for those I have registered. In the 2nd semester, from February 2020 to date, I have registered 3 courses and seminar I. But we are not taking the courses at the place where we have registered due to the emergency of COVID-19 pandemic. Even if it is the case, I am actively taking two of the courses (Advanced biological wastewater treatment and Cleaner bioprocess) online. Hopefully, we will finish these courses as per the schedule of the 2nd semester. Together with the courses, I have written and get first feedback on my seminar I by my supervisor, and right now I have completed the final draft and awaiting final feedback for the presentation. We, Getnet and Tadele, have been searching out some of the common equipment's weather or not available in the nearby market even though we have not developed the proposals. The one and the very important I have done is, a

discussion with my supervisor. The early first draft of my research plan was completely out of the scope and we did a fruit full discussion with my advisor and reached an agreement to rewrite the proposal. In this regard, we have been discussed that we should construct the main and specific objectives and send them to the supervisor before writing the full proposal. Even if it is too late due to the current situation, I have sent the main and specific objectives to my supervisor on June 26, 2020. Once the supervisor accepts and corrects these objectives, ready to write the detailed methodologies for each objective.) Definitely there is a big problem with internet access after I left from Addis Ababa, I am writing part of the research plan (background of the study, research gaps, etc...)

Getnet Belay, PhD Student

1. I have completed the first semester courses for those I have registered.
2. I have registered 3 courses for the second semester. But due to the occurrence of the pandemic (COVID-19) attending face to face lesson have been interrupted, but for (Biological waste water treatment and Cleaner Bioprocce) I have attending online and almost on the way to cover all parts. I am waiting to take the remaining two courses as the course holders are ready to do so.
3. Side to side I did seminar one and send it to my advisor and got corrections and comments. Within the coming two weeks it will be finalized and ready for presentation.
4. I have a visit on the market to collect the basic materials which are necessary to our research set up for those which are not dependent on my specific methodology like aerator and water pumps. I was comparing the price of the materials from different traders. This was totally stopped at the onset of the pandemic.
5. Even though I developed the proposal at the beginning of the year, it was partially out of the scope of the project and we did a fruit full discussion with my advisors and reached at an agreement to rewrite the proposal. Indeed there are big issues on internet access after the pause of face to face lesson, I am writing the proposal (the introduction part, statement of the problem, significance of the study and some part of the literature is completed I also organized my objectives and send it for my advisors. Once my advisors accepts and corrects those objectives I am going to write the method part for each objective.
6. Generally I am doing my best despite facing great challenge to get internet access.

NatnaelGirma, PhD student currently at SLU, Sweden

No report has been submitted. We know that he has defended his proposal at the Institute and carried out his field research work in Ethiopia. He is currently carrying out his research at SLU, Sweden.

Sub project 6

The following 4 students and their projects are included under this sub project.

(a) BehanuSibhat, PhD Student

Project Title: Brucellosis

Supervisors: Dr. TesfayeSisay AND Dr. HaileyesusAdamu, AAU; Dr. Johanna Lindahl, Prof. Ulf Magnusson, SLU

(b) FikreZeru, PhD student

Project title: Campylobacter

Supervisors: Dr. TesfayeSisay and Dr. HaileyesusAdamu, AAU; Prof. Sofia Boqvist, Assoc. Prof. Ingrid Hansson, SLU

(c) WagawSendeku, PhD student

Project title: Antimicrobial resistance (AMR)

Supervisors: Prof. Dr. Tesfaye Sisay and Dr. HaileyesusAdamu, AAU, Prof. Ulf Magnusson and Prof. Susanna Sternberg Lewrin, SLU

(d) YeshakRedda, PhD Student

Project title: Rotaviruses in health and disease in ruminants and humans

Supervisors: Dr. Tesfaye Sisay and Dr. Haileyesus Adamu, AAU; Prof. Mikael Berg and Dr. Johanna Lindahl, SLU

Common progresses:

All of them have completed course work and have developed their proposals.

The Proposals have been commented and discussed between AAU and SLU supervisors. This was accomplished when the Ethiopian supervisors visited SLU in November 2019 as well as when some of the SLU supervisors visited the Institute in February 2020. All of them have submitted their proposals for the Institute to conduct public defense which could have been completed by now, had it not been that COVID-19 pandemic led to lockdown.

The students have involved in procuring most of the research consumables from local markets. Those materials that are not available locally have been identified and need to be solicited from Sweden through the Swedish supervisors.

All the students have identified their research sites. Students working on Antimicrobial resistance, rotavirus and campylobacter have contacted relevant people and offices on their research sites to collect samples.

All of them have been greatly hindered by the COVID-19 pandemic for field sample collection because samples will be collected from animals and their keepers and people are not willing to collaborate during this time and it is not allowed to do so as well.

Therefore, the field research component of this sub project is highly affected by the current situation.

We expect that the field work will commence immediately after the announcement of control of the pandemic in the country by the concerned government bodies, which is expected to be after the summer season.

8. Proposal preparations by PhD students

The selected PhD students have been engaged at the Institute of biotechnology, AAU, in the following academic activities:

guiding students to prepare their proposals timely; discussion on the proposals of the students among AAU and SLU supervisors- some in person; via e- mails and Skype Public defense of PhD proposals by some students

3. Management and Economics PhD Program

The Economics and Management departments at the College of Business and Economics at AAU and Jönköping International Business School (JIBS) at Jönköping University (JU) and University of Gothenburg (UGOT) in Sweden have agreed to enter into a partnership including training and research in PhD education programmes in the subjects of economics and management delivered in local modes. The program target PhD candidates among staff at Ethiopian universities.

The overall objective of the partnership is to increase the scientific knowledge of international quality in the fields of economics and management, generated through a sustainable research system within the departments of economics and management at AAU that is used to contribute to Ethiopia's development aspirations.

The project is aimed at achieving the following objectives:

- Improve the institutional and research infrastructure to support a sustainable environment for research and innovation it helps to do their work in attention.
- Strengthening local PhD training with high quality in public universities both the departments are follow-up the students status.
- Increase the generation and dissemination of knowledge and research outputs

Various activities have been accomplished in 2019/20 Academic Year to meet the above mentioned objectives. The detail accomplishments are summarized in activity, budget and RBM reports. This narrative reports outlines major challenges and outstanding activities in some detail.

The nature of this partnership is intended to be inclusive and participatory in terms of process developments and clear and accountable with reference to the line management structure. AAU will offer the PhD degrees delivered in this collaboration, organized as course-based PhD programs in economics and management. PhD-courses will be offered in Ethiopia, Sweden and potentially in neighbouring countries as part of a regional East-African network.

The objective of research supporting component is to enhance the quality of PhD supervision through the establishment of ICT facilities and specific software needed.

3.1 Main performances achieved in 2019/2020.

3.1.1 PhD Defence

During July 01, 2019 to June 30, 2020 budget period, 11 PhDs (10 in Economics and 1 in Management) have been graduated. This shows a very high number of graduates in a single year under the SIDA financed project from the College of Business and Economics of Addis Ababa University.

3.1.2 PhD student travel to JIBS and UGOT

In total 19 PhD students in Management have made their first round trip to JIBS for consultation with their supervisors and to the completion of their PhD courses. During the second round trip only 15 PhD students did travel and 5 from fifth batch PhD students could not travel to take their final course during the second round because of the COVID 19 restrictions.

In Economics 10 PhD students have travelled twice and 8 PhD students have travelled once (second round trip was disrupted due to COVID 19), 8 students have also made their travel for course works. Some students stayed more than average time period at JIBS to expedite the progress of their works, which actually resulted on timely completion and successful defence of the same.

3.1.3 Staff travel for theses co-supervision

In Management department, 11 local professors have travelled to JIBS for co-supervision to participate in the joint PhD supervision with JIBS professors and expedite the progress on PhD students' dissertation works. 2 professors have travelled to JIBS for course co-teaching preparation in February 2020.

In Economics, only 2 professors have travelled to JIBS for co-supervision of PhD students during the first round. The visited has been limited due to tight schedule and Visa processing related issues and mainly due to the outbreak of COVID 19.

3.1.4 Career Development Initiative (CDI)

The CDI has been implemented with the objective of enhancing the research and publication culture of staff members at Economics and Management Departments. To this end, from the rolled over budget of 2018/19, 8 staff members form Economics and Management have

travelled during the summer of 2019 to JIBS and UGOT for two weeks. Their research works are under way for publications.

The CDI of 2019/20 has been already announced and 9 staff members from the two departments have been selected. However, because of the COVID 19, any travel arrangements to JIBS and UGOT are still pending. Thus they are expected to travel to JIBS/UGOT in 2020.

3.1.5 Regular Research Seminar Series

The objective of Regular Research Seminar Series is availing panel data for staff and students for joint publications. Researchers under the four thematic areas (productivity, innovation, marketing and entrepreneurship) have been undertaken by staff and students by using Budget 2018/19. In this respect progress has been registered so far. However, 2nd round announcement for year 2020 limited due to COVID 19.

3.1.6 Procurement of office material and software and video conference equipment

So far the procurement of office material, software as well as video conference equipment are not yet materialized mainly due to budget shortages. Video conference equipment could have been so crucial in this trying time of COVID 19 in particular as it facilitates the PhD supervision process through online student supervision discussions, attending international conference and holding meeting, and also conducting online PhD defense sessions. It was SEK 289,000 in the previous year. But, the cost for purchasing video conference is very expensive as explained in the annual meeting of November 2019.

3.1.7 Employment of SIDA coordinator for Economics and Management

Mrs. Tirsit Teshome is employed as a coordinator for Sida supported Economics and Management PhD program as of January 2020.

3.1.8 Book chapter publications

Based on the conference of Kigali, Rwanda in 2019, 8 book chapter publications have appeared in the spring of 2020. For the participation of the conference for both PhD students and staff members of Economics and Management, SIDA support has been instrumental.

3.2 Challenges due to COVID-19

The second semester of the academic year (2019/20) exhibited unprecedented challenges that constrained the academic departments to transfer some of their planned activities and perform some of them employing varied mechanisms including virtual platforms. The major cause of the challenges has been the COVID-19 pandemic. The Ministry of Health of the Federal Democratic Republic of Ethiopia (FDRE) confirmed the first COVID-19 case in Addis Ababa on March 19, 2020. Ethiopia endorsed the Proclamation 3/2020, the State of Emergency Proclamation Enacted to counter and Control the Spread of COVID-19 and Mitigate It's Impacts, to curb the transmission of the Corona Virus. The Proclamation included banning public gatherings including direct student-teacher meetings and movements at land borders (except cargo and essential goods). Those changes have been presenting unprecedented challenges to conduct classes, dissertation defense sessions, organize seminars and training programs. Some of the major challenges are outlined in this narrative report.

The following activities have been cancelled or transferred to 2020/21 due to COVID-19. It has been planned to using virtual platform if the challenges of COVID-19 continue for a prolonged time. Activities that involved travel of students and professors within Ethiopia and abroad were the most affected tasks. The following are good example:

The second round trip to JIBS for PhD. students of Economics and Management has been cancelled due to COVID19 spread

- i. The second round trip for 6 PhD economics students to UGOT has been cancelled due to COVID-19 spread. And, it can be transferred to 2020/21 A.Y.
- ii. Travels of professors were also cancelled and transferred to the 2020/21 academic year. Almost all second round visits (both AAU/JIBS and AAU/UGOT) by Ethiopian Professors have been cancelled. Moreover, it has been planned to carry out the activities via virtual platform if the problems related to COVID-19 sustained for longer time.

The spread of COVID-19 also affected the course delivery and training programs at large. For example, face-to-face classes for batch 5 Management PhD students were cancelled due to COVID 19. However, despite some challenges I initially, the classes were conducted employing online platform

- iii. In addition to classes, training programs were also interrupted. Plagiarism training program scheduled by AAU and JIBS staff (for AAU staff and PhD students) could not be delivered due to a restriction on gathering and inter-nation trips (6). As a result, it has been planned to

conduct the face-to-face training programs in the 2020/21 academic year; and if the challenges related to COVID-19 remain, the plan considered conducting the training activities via online platform. The following activities have also been interrupted:

- iv. Regarding AAU faculty for Career Development Initiative: although, 9 staff for Career Development Initiative (CDI) was selected to stay in Sweden for two weeks, all trips have been cancelled due to COVID-19-related flight restrictions.
- v. A similar problem was encountered to AAU staff for post doc programs though 3 staff for post doc programs in management at JIBS were selected. All trips have been cancelled due to flight restriction.
- vi. Similarly the travel of 3 AAU staff selected for Post Doc at UGOT in economics was cancelled due to flight restriction. This presented another challenge for the Career Development Initiative.

It has been anticipated that the above mentions schemes related to the career development initiative could be transferred to 2020/21 if the spread of COVID-19 is controlled and mitigated.

3.3 Explanation for Budget Variance

Under activity 1: PhD Sandwich training in Sweden” Budget item (Salary JIBS Management and JIBS economics) the original budget 250,000SEK should move to academic year 2020/21 because reallocation of PhD students 2 to JIBS and 6 to UGOT.

Under activity: 2PhD Sandwich Allowance in Sweden” Budget item (Allowance JIBS Management, Allowance JIBS economics & Allowance UGOT economics) the original budget is increased by 2,922,000SEK due to change student stipends in Sweden to 18,000 as per the APM meeting May 2019.

Under activity 3: Local PhD training/Curriculum Development” Budget item Salaries PhD courses in economics UGOT the original budget is decrease by 864,000 SEK due to the fact that the entire 864,000 SEK amount should be moved to academic year 2020/21, because these are a series of second year courses and the recruitment of PhD students has been moved to fall 2019. The 2019/20 amount should therefore be zero. (As mentioned in previous report)

Under activity 12: other costs Ethiopia (Must be specified)” Budget item ‘International Conference in UGOT and JIBS’ the original budget postponed to academic year 2020/21 due to COVID 19.

3.4 Lessons and good experiences

The challenges caused by COVID-19 have also brought some opportunities and positive outcomes including an increasing utilization of the internet and online platforms (e.g., Skype, Zoom, and Google meet) for accomplishing various activities. For example, banning face-to-face classes and meetings have encouraged faculty members and graduate students to explore alternative ways: using online platforms to conduct online classes, organize virtual MA and PhD defense session, and provide online trainings (e.g., training on plagiarism checking). For example, 8 economics and 1 management PhD dissertation defense sessions were successfully conducted via virtual platform. Economics PhD classes were also conducted using online technologies. These exercises have demonstrated the possibilities of using online platforms as alternative and resource effective mechanisms when physical presence (face-to-face contact) is impossible.

Table 14: Annual Report of Result Based Management: MGMT and ECON 01 July 2019 to 30 June 2020

Types of Outputs expected	Outcome expected including targets	Time	Performance Indicators of outcome	Cost (ETB for Ethiopian side)	Variance Analysis	Outcome result observed in 01/07/2019-30/06/2020	Output Produced in year to obtain outcome	Remark
Specific Objective # 1: Improve the institutional and research infrastructure to support a sustainable environment for research and innovations at CoBE by 2018/19								
To have equipped an office space for PhD students within the local PhD programs at departments of economics and management at AAU	1.1 To have the office space well used by local PhD students	12/1/2019-30 June 2020	Number of PhD students using the office space	0.00	0	Availing working space for PhD students	In the number of available office sits for PhD students	Not all PhD students have got office spaces
Specific Objective # 2: Strengthen local PhD training with high quality in public universities in Ethiopia by 2019/20.								
Department of Management								
4 PhD students in the doctoral program in management sciences delivered courses (in batch 5)	2.1. 4 PhD students to have completed their courses delivered by JIBS and department of management at AAU	Sep 2019-June 2020	4 students graded pass or above in courses delivered by JIBS	209,468.00	113,468.00	University records at AAU and JIBS	Final courses delivery completed	4 PhD candidates (from batch 5) completed the courses.
Development of conceptual frame w four batch 4 PhD	2.2 PhD research proposal	Sep 2019-June 2020	Number of research proposal	192,625.00	-359,375.00	Development of 4 conceptual	4 students presented their proposal with	1 PhD candidate lagging from

AAU-Sida Projects 2019/2020 Technical Report

Types of Outputs expected	Outcome expected including targets	Time	Performance Indicators of outcome	Cost (ETB for Ethiopian side)	Variance Analysis	Outcome result observed in 01/07/2019-30/06/2020	Output Produced in year to obtain outcome	Remark
students	accepted from 4 batch four PhD student by the committee of supervisors		accepted			frameworks	main and local supervisors at JIBS to finalize conceptual framework	monograph preparation due health reasons.
Batch 2 four PhD students Thesis work progress for completion	2.3. PhD students have progressed their PhD thesis works	Sep 2019- June 2020	Number of PhD thesis works progressed	55,332.00	(55,332.00)	5 PhD monograph works progress	5 monographs works progressed and approved by their respective supervisors	The work could not progress as expected partly as all the students were in quarantine while coming from JIBS
Third batch four students PhD theses work	2.4. PhD students work progressed	Sep 2019- June 2020	Number of PhD thesis works progressed			4 PhD monograph works progress	4 monographs works progressed and approved by their respective supervisors	
1 PhD student research works for their dissertation (Batch 1)	2.5. To have increased the quality of research within the field of management sciences	Sep 2019- June 2020	Completion of their dissertation ready for defense and publication	39,353.00	-39,353.00	1 PhD student has completed their research work and defended his thesis	Professors from JIBS involved in course teaching, supervision, and external examiner selection, and defense session conducted via online ,	1 PhD candidate defended his PhD thesis on June 19, 2020

AAU-Sida Projects 2019/2020 Technical Report

Types of Outputs expected	Outcome expected including targets	Time	Performance Indicators of outcome	Cost (ETB for Ethiopian side)	Variance Analysis	Outcome result observed in 01/07/2019-30/06/2020	Output Produced in year to obtain outcome	Remark
Increasing internal capacity for PhD training	2.6 To have increased capacity among AAU faculty to teach and advise on the PhD-programme in management sciences.	Dec-19	11 Number of staff at departments of management at AAU co-teaching and co-advising together with JIBS staff			11 staff members being trained and capacity enhanced	Staff allocation and assignment for PhD theses supervision, and training in ethical research methods. Delivery for co-teaching is conducted in June 2020 via online	Co-teaching could not be materialized physically due to COVID 19 and hence conducted via online
Department of Economics								
8 PhD students in the doctoral program in Economics delivered courses (batch 7)	8 PhD students are admitted with the sandwich program of JIBS/UG and started class. They took mathematical economics course in JIBS	Oct-19	8 students have been assessed and on the way to take final exam as per the schedule of the AAU	275,360.00	83,360.00	University records at AAU and JIBS	One of the first year courses	8 PhD candidate completed mathematical economics and on the way to finish to complete other course.

AAU-Sida Projects 2019/2020 Technical Report

Types of Outputs expected	Outcome expected including targets	Time	Performance Indicators of outcome	Cost (ETB for Ethiopian side)	Variance Analysis	Outcome result observed in 01/07/2019-30/06/2020	Output Produced in year to obtain outcome	Remark
Development of conceptual framework, preparation of the first article (batch 6)	8 PhD research papers (proposal accepted and they are in the process of producing the first article) and under review of the committee of supervisors	Sep 2019- June 2020	8 PhD research proposal accepted and in the process of articles production	220,366.00	(163,634.00)	Articles production	8 students presented their first articles in consultation of with main and local and main supervisors at JIBS/JIBS and candidates received comments from their supervisors on their works	Almost all of them produce proposals and are in the process of producing the first article.
Preparation of the last articles and Working on finalizing their monograph (batch 5 and 4)	10 PhD monograph under review of the committee of supervisors	Sep 2019- June 2020	10 PhD research proposal accepted and in the process of articles production	679,496.00	295,496.00	last Articles production	10 students presented their 2nd and 3rd articles with main and local and main supervisors at JIBS and candidates received comments from their supervisors on their works	Almost all of them are in the process of finalizing their work with in the coming 6 months. The variance is due to change in the exchange rate
2 PhD student research works for their final dissertation	2 Final monographs production	Sep 2019- June 2020	Completion of their dissertation ready for	47,095.00		2 PhD students have completed	Professors from abroad and others involved in course	The variance is due to change in the exchange rate

AAU-Sida Projects 2019/2020 Technical Report

Types of Outputs expected	Outcome expected including targets	Time	Performance Indicators of outcome	Cost (ETB for Ethiopian side)	Variance Analysis	Outcome result observed in 01/07/2019-30/06/2020	Output Produced in year to obtain outcome	Remark
(Batch 3)			defense and publication			their research works and defended their theses	teaching, supervision, internal and external examiner selection, hotel booking and ticket procured, defense session conducted,	and most of them did not get invitation from their main supervisors
Increasing internal capacity for PhD training	To have increased capacity among AAU faculty to teach and advise on the PhD-program in economics management sciences.	Sep 2019-June 2020	16 Number of staff at departments of management and economics at AAU co-teaching and co-advising together with JIBS staff			16 staff members being trained and capacity enhanced	Staff allocation and assignment for PhD theses supervision, and training in ethical research methods	Staff development program is now implemented to promote to the next rank
Specific Objective # 3: Increase the generation and dissemination of knowledge and research outputs by 2019/2020								
To participate in international conference/workshops	To have increased the number of scientific articles in economics presented at	Sep 2019-June 2020	3 students presented their articles at the Oxford International Conference hosted by			3 research papers presented at the conference	Conference Records	The Conference hosted by AAU in collaboration with Oxford

AAU-Sida Projects 2019/2020 Technical Report

Types of Outputs expected	Outcome expected including targets	Time	Performance Indicators of outcome	Cost (ETB for Ethiopian side)	Variance Analysis	Outcome result observed in 01/07/2019-30/06/2020	Output Produced in year to obtain outcome	Remark
	the conferences by PhD students or faculty of AAU		AAU, CSAC and Oxford					
Publications in book chapter and peer reviewed articles	To have increased the number of scientific articles in economics and management presented at the conferences by PhD students or faculty of AAU	Sep 2019- June 2020	No of staff and PhD students publishing their research works			2 staff members published their book chapters in Springer nature	8 staff publications	
Conduct international conference at AAU	To have increased the number of scientific articles in economics and management presented at the conferences by PhD	Mar-20	More staff and PhD students were expected to present their research works			No of research works presented	The conference cancelled due to COVID 19	

AAU-Sida Projects 2019/2020 Technical Report

Types of Outputs expected	Outcome expected including targets	Time	Performance Indicators of outcome	Cost (ETB for Ethiopian side)	Variance Analysis	Outcome result observed in 01/07/2019-30/06/2020	Output Produced in year to obtain outcome	Remark
	students or faculty of AAU							
To have, within the Career Development Initiative, invited faculty at departments of economics and management at AAU to JIBS for mentorship in writing a publishable scientific article	To have published articles in international journals and/or in international conferences	Sep 2019- June 2020	8 articles published in international journals or presented in international conferences from AAU faculty involved in Career Development Initiative	1,518,961.00	218,161.00	0	8 staff working their research under CDI announced in 2018/19. The call for 2019/20 has selected 9 staff members. But could not travel to JIBS due to COVID 19	
Post-Doctoral Program invited by the department of economics, management and JIBS /UG	To produce scientific paper and to be publishable in international journal	January 2020 to December 2021	2 post-doctoral students from economics and 2 from management are selected			0	Selection were made to start from March 2020 for 10 months	Could not be materialized due to COVID 19 restriction
To have organized regular research seminar series at each departments (management and economics) to be announced at each 6 months	To have completed research seminars according to the research seminar plan	Mar-20	Number of seminars completed	800,001	609,999	The processing has been ongoing since March 2019 and will end in December 2019. But the financial	4 Thematic areas identified, project document prepared, researchers and coordinators selected along the 4 thematic	10 papers will be presented in 2020 as COVID 19 break out data collection was stuck. The remaining balance will be

AAU-Sida Projects 2019/2020 Technical Report

Types of Outputs expected	Outcome expected including targets	Time	Performance Indicators of outcome	Cost (ETB for Ethiopian side)	Variance Analysis	Outcome result observed in 01/07/2019-30/06/2020	Output Produced in year to obtain outcome	Remark
						constraints will make the program to extend	areas and final data collection instrument prepared.	affected soon.
External examiners solicited for PhD defense	External examiners selected in Economics (12) and Management (7) to participate in the defense and disseminate their knowledge during the defense	Sep 2019 to June 2020	Number of defended PhD dissertations			Ensure the quality of PhD dissertations defenses	Selection of external and internal examiners and also arranging all travel and accommodation facilities	Payment yet effected as per the discussion at the annual meeting in Nov 2019
Professors visit to JIBS	14 from Economics, and 7 from Management Ethiopian Professors visit to Sweden for supervision meeting	November 2019 to June 2020	Attending on the progress on students dissertation works	308,455.00	1,335,545.00	One from economics and 5 from management professors attended on the progress on students dissertation works	18 students from economics presented their proposal and articles at different level with main and local supervisors at JIBS /UG	

Table 15: Annual Activity Report / Procurement Plan: 01 July 2019 to 30 June 2020

Responsible center	Planned Activity / Procurement	Time	Outcome Expected including targets	Performance Indicators of outcome	Cost (ETB for Ethiopian side)	Outcome result observed in 01/07/2019-30/06/2020	Activities done in year to obtain outcome	Remarks
Department of Management								
First round trips for Sandwich Students								
	a. First batch 1 PhD student first round trip Sweden JIBS for supervision	September, 2019 to Dec. 2019	Completion of the draft thesis	First batch 1 candidate		PhD thesis further works	1 PhD thesis preparation for defense	the candidate readmitted after 1 year withdrawal
	b. Second batch first round trip to Sweden JIBS for supervision	September, 2019 to Dec. 2019	Completion of the draft thesis	Second batch 5 candidates	58672	Thesis being under progress for completion	Approval by supervisors	
	c. Third batch Student first round-trip to Sweden JIBS for supervision	September, 2019 to Dec. 2019	Progress on of the monograph/thesis draft	third batch 5 candidates	133953	Document being ready for comments	4 student works approval by supervisors	1 PhD candidate under withdrawal due to health reasons
	d. fourth batch first round trip to Sweden JIBS for course work	September, 2019 to Dec. 2019	Development of conceptual framework of their PhD Thesis	Fourth Batch 4 candidates	84340	Ready to develop data collection methodology	4 approved PhD proposal/conceptual frameworks	
	e. fifth batch first round trip to Sweden JIBS for course work	September, 2019 to Dec. 2019	Completion of remaining courses	Fifth batch 4 students	125128	Being ready for final exam	Grades submitted	

AAU-Sida Projects 2019/2020 Technical Report

Responsible center	Planned Activity / Procurement	Time	Outcome Expected including targets	Performance Indicators of outcome	Cost (ETB for Ethiopian side)	Outcome result observed in 01/07/2019-30/06/2020	Activities done in year to obtain outcome	Remarks
Second round trips for Sandwich Students								
	a. First batch 1 PhD student second round trip Sweden JIBS for supervision	January 2020 to April 2020	Completion of the draft thesis	First batch 1 candidate		PhD thesis finalization for defense	1 PhD thesis defended	the candidate readmitted after 1 year withdrawal
	b. Second batch second round trip to Sweden JIBS for supervision	January 2020 to April 2020	Further work on the draft thesis	Second batch 5 candidates		Thesis being under progress for completion	Approval by supervisors	
	c. Third batch Student second round-trip to Sweden JIBS for supervision	January 2020 to April 2020	Further progress on the monograph/thesis draft	third batch 5 candidates		Document being ready for comments	4 student works approval by supervisors	1 PhD candidate under withdrawal due to health reasons
	d. fourth batch second round trip to Sweden JIBS for course work	January 2020 to April 2020	Further development of PhD research works	Fourth Batch 4 candidates		Further development of data collection methodology	4 approved PhD proposal/data collection methodology	
	e. fifth batch second round trip to Sweden JIBS for course work	January 2020 to April 2020	Completion of 1 remaining course	Fifth batch 4 students		None	None	Due to COVID 19 they could not travel in March 2020
Department of Economics								
Trip to Sweden								

AAU-Sida Projects 2019/2020 Technical Report

Responsible center	Planned Activity / Procurement	Time	Outcome Expected including targets	Performance Indicators of outcome	Cost (ETB for Ethiopian side)	Outcome result observed in 01/07/2019-30/06/2020	Activities done in year to obtain outcome	Remarks
	a. Third batch last round trip to Sweden JIBS for finalization of dissertation	Aug-19	Completion of dissertation	Third Batch 2 candidate	47,095.00	Already defended and graduated	Approval by supervisors and examiners	
	b. Fourth batch two last round trips to Sweden JIBS for supervision	July 2019 to April 2020	Completion of their dissertation	Fourth batch 3 candidates have already defended	401,392.00	3 of them have already defended	Approval by supervisors and examiners	
	c. Fifth batch two last round trip to Sweden JIBS for supervision	Oct-19	Completion of their dissertation	Fifth batch 5 candidates have already defended		5 of them have already defended	Approval by supervisors and examiners	
	d. Sixth batch first round trip to Sweden UGOT /JIBS for supervision	Nov-19	Development of conceptual framework of their PhD Thesis	Sixth batch 8 candidates	220366	Study framework is done and working on the first articles	Advisors progress report submitted	
	e. Seventh batch first round trip to Sweden JIBS for course	Oct-19	Taking mathematical course	Seventh batch 8 candidates	275360	have already taken the course	Result report submitted	
Department of Management								
	Ethiopian Professors visit to Sweden supervision meeting	September, 2019 to Dec. 2019	Progress on students dissertation works	11 professors	133321	Improved dissertation work (only five professors visited)	Report by advisory committee	
	Ethiopian Professors Allowances according to AAU regulations	September, 2019 to Dec. 2019	Progress on students dissertation works	11 professors	343500	Improved dissertation work (for five professors visited)	Report by advisory committee	

AAU-Sida Projects 2019/2020 Technical Report

Responsible center	Planned Activity / Procurement	Time	Outcome Expected including targets	Performance Indicators of outcome	Cost (ETB for Ethiopian side)	Outcome result observed in 01/07/2019-30/06/2020	Activities done in year to obtain outcome	Remarks
	Ethiopian Professors visit to Sweden	January 2020 to April 2020	Course co-teaching preparation	2 professors		Teaching modalities and materials ready in consultation with JIBS professors	Course delivered for fifth batch PhD students	
Department of Economics								
	Ethiopian Professors visit to Sweden supervision meeting	Dec-19	Progress on students dissertation works	16 professors		Only one Ethiopian professor visited JIBS for Improving dissertation work. Due to tight schedule and Visa process, others would not go	Report by advisory committee	
	Ethiopian Professors Allowances according to AAU regulations	Dec-19	Progress on students dissertation works	16 professors	41,813.00	Only one Ethiopian professor visited JIBS for Improving dissertation work. Due to tight schedule and Visa process, others would not go	Report by advisory committee	
	Honorarium of 12 external examiners for defense of 12 PhD candidates	Mar-20	Ensure the quality of PhD dissertations	12 professors		Sofar, two of our PhD students have successfully defended. Two external examiners came in October and December 2019	Report by board of examiners	
Both Departments of Economics and Management								

AAU-Sida Projects 2019/2020 Technical Report

Responsible center	Planned Activity / Procurement	Time	Outcome Expected including targets	Performance Indicators of outcome	Cost (ETB for Ethiopian side)	Outcome result observed in 01/07/2019-30/06/2020	Activities done in year to obtain outcome	Remarks
	AAU faculty for Career Development Initiative, allowances for two weeks in Sweden (USD 370 =SEK 3300 x14 days*8)	January 2020 to April 2020	Development of conceptual framework and further work on their proposals	8 staff members from economics and management	107115	Articles ready to publish in peer-reviewed journals	Number of accepted and published articles	Note that this one is by Budget 2018/19 rolled over to this year. AND, CDI 2019/20 has already announced and result will be released soon. Those who win CDI initiative will visit JIBS/UG in 2020
	Flights for Career Development Initiative, SEK 8000 per ticket	Mar-20	Development of conceptual framework	Supervisors and candidates 30 persons		Articles ready to publish in peer-reviewed journals	Number of accepted and published articles	
	AAU faculty for Career Development Initiative, allowances for two weeks in Sweden (USD 370 =SEK 3300 x14 days*9)	January 2020 to April 2020	Development of conceptual framework and further work on their proposals	9 staff members from economics and management		Not yet done	Not yet done	Due to COVID 19 travel not materialized
	Supervision capacity building training at AAU	10/1/2019 2/1/2020	Research ethics building	Supervisors and candidates 30 persons		Not yet done	Not yet done	Not done due to COVID 19
	Data collection for regular seminar series	Feb-20	Availing data for staff and students for joint publications	No staff and students involved	800,001.01	Researches undertaken by staff and students by using Budget	Number of thematic research works	Note that this one is on progress by Budget

AAU-Sida Projects 2019/2020 Technical Report

Responsible center	Planned Activity / Procurement	Time	Outcome Expected including targets	Performance Indicators of outcome	Cost (ETB for Ethiopian side)	Outcome result observed in 01/07/2019-30/06/2020	Activities done in year to obtain outcome	Remarks
						2018/19, However, 2nd round announcement for year 2020 limited due to COVID 19	undertaken for paper works	2018/19 rolled over to this year and the payment is expected to be effected for staff involved end of this June 2020. Note that Birr 800, 001.01 has already been paid and the remaining balance will be paid soon
	Office material and software (Remarks: It was SEK 289,000 in the previous year. But, the cost for purchasing video conference is very expensive as explained in the annual meeting)	September, 2019 to June 2020	facilitating the PhD adviser ship with external examiners, attending international conference and holding meeting			Following the revision of budget, it is on the process of purchasing the equipment since September 2019, However, the budget is not released for 2019/20	One establishing Video conference hall and software	This activity is not yet materialized due to budget limitation with the current market price of the same
Department of Management								

AAU-Sida Projects 2019/2020 Technical Report

Responsible center	Planned Activity / Procurement	Time	Outcome Expected including targets	Performance Indicators of outcome	Cost (ETB for Ethiopian side)	Outcome result observed in 01/07/2019-30/06/2020	Activities done in year to obtain outcome	Remarks
	EFMD accreditation process	September, 2019 to June 2020	Negotiations enhanced with accrediting body	1 EFMD, AMBA or AACSB contacted		Not yet done	Not yet done	Still the activity could not be materialized

Table 16: Budget

Activities	Original budget 2019/20 SEK/ETB (1SEK=3.13922 ETB)	APM budget 2019/20 SEK/ETB: (1SEK=3 ETB)	Difference 2019/20 SEK/(ETB)	APM budget 2019/20 (in SEK)	Some Explanation and Revision due to COVID_19
Trips for Sandwich Students					
Student round-trip to JIBS for supervision	1,255,688.00	1,104,000.00	151,688.00	368,000.00	2nd round trip for economics and management PhD students to JIBS has been cancelled due to COVID19 spread. And, it can be transferred to 2020/21 if COVID is managed. Otherwise, activities will be conducted via online platform.
Student round-trip to UGOT for supervision	200,910.08	288,000.00	(87,089.92)	96,000.00	2nd round trip for 6 PhD economics students to UG has been cancelled due to COVID19 spread. And, it can be transferred to 2020/21 if COVID is managed. Otherwise, activities will be conducted via online platform.
Student round-trip to JIBS for taking PhD courses	125,568.80	96,000.00	29,568.80	32,000.00	PhD course delivery for batch 5 Management PhD students is cancelled due to COVID 19. Activities are being conducted via online platform. The same budget can be transferred to 2020-21 for similar activities
Sub total	1,582,166.88	1,488,000.00	94,166.88	496,000.00	
Ethiopian Professors visit to Sweden and Honorarium Payment to External Examiners	-	-	-	-	
Air tickets AAU/JIBS co-supervisors	627,844.00	600,000.00	27,844.00	200,000.00	Except few, almost all 2nd round visits by Ethiopian Professors have been cancelled. And, it can be transferred to 2020/21 if COVID is managed. Otherwise, activities will be conducted via online platform.

AAU-Sida Projects 2019/2020 Technical Report

Activities	Original budget 2019/20 SEK/ETB (1SEK=3.13922 ETB)	APM budget 2019/20 SEK/ETB: (1SEK=3 ETB)	Difference 2019/20 SEK/(ETB)	APM budget 2019/20 (in SEK)	Some Explanation and Revision due to COVID_19
Air tickets AAU/UGOT co- supervisors	100,455.04	96,000.00	4,455.04	32,000.00	Except few, almost all 2nd round visits by Ethiopian Professors have been cancelled. And, it can be transferred to 2020/21 if COVID is managed. Otherwise, activities will be conducted via online platform.
Allowances according to AAU regulations JIBS	1,294,928.25	1,237,500.00	57,428.25	412,500.00	Except few, almost all 2nd round visits by Ethiopian Professors have been cancelled. And, it can be transferred to 2020/21 if COVID is managed. Otherwise, activities will be conducted via online platform.
Allowances according to AAU regulations UGOT	310,782.78	297,000.00	13,782.78	99,000.00	Except few, almost all 2nd round visits by Ethiopian Professors have been cancelled. And, it can be transferred to 2020/21 if COVID is managed. Otherwise, activities will be conducted via online platform.
Sub total	2,334,010.07	2,230,500.00	103,510.07	743,500.00	-
Supervision capacity building training at AAU	-	-	-	-	
Transport, plagiarism training	12,556.88	12,000.00	556.88	4,000.00	The training which was scheduled by AAU and JIBS staff (for AAU staff and PhD students) could not be delivered due to a restriction on gathering and international trips. So it is cancelled. And, it can be transferred to 2020/21 if COVID is managed. Otherwise, activities will be conducted via online platform.

AAU-Sida Projects 2019/2020 Technical Report

Activities	Original budget 2019/20 SEK/ETB (1SEK=3.13922 ETB)	APM budget 2019/20 SEK/ETB: (1SEK=3 ETB)	Difference 2019/20 SEK/(ETB)	APM budget 2019/20 (in SEK)	Some Explanation and Revision due to COVID_19
Accommodations and food, plagiarism training	235,441.50	225,000.00	10,441.50	75,000.00	The training which was scheduled by AAU and JIBS staff (for staff and PhD students) could not be delivered due to a restriction on gathering and international trips. So it is cancelled. And, it can be transferred to 2020/21 if COVID is managed. Otherwise, activities will be conducted via online platform.
Sub total	247,998.38	237,000.00	10,998.38	79,000.00	-
Other costs in Ethiopia (Must be specified)					
AAU faculty for Career Development Initiative, allowances for two weeks in Sweden	1,160,255.71	1,108,800.00	51,455.71	369,600.00	9 staffs for CDI were selected. But all trips have been cancelled due to flight restrictions. And, it can be transferred to 2020/21 if COVID is managed.
Flights for Career Development Initiative	200,910.08	192,000.00	8,910.08	64,000.00	9 staffs for CDI were selected. But all trips have been cancelled due to flight restriction. And, it can be transferred to 2020/21 if COVID is managed.
Travel cost for Post Doc at JIBS in management	75,341.28	72,000.00	3,341.28	24,000.00	3 staffsfor post doc were selected. But all trips have been cancelled due to flight restriction. And, it can be transferred to 2020/21 if COVID is managed.
Travel cost for Post Doc at JIBS in economics	50,227.52	48,000.00	2,227.52	16,000.00	3 staff for post doc were selected. But all trips have been cancelled due to flight restriction. And, it can be transferred to 2020/21 if COVID is managed.
Travel cost for Post Doc at UGOT in economics	25,113.76	24,000.00	1,113.76	8,000.00	3 staff sfor CDI were selected. But all trips have been cancelled due to flight restriction. And, it can be transferred to 2020/21 if COVID is managed.

AAU-Sida Projects 2019/2020 Technical Report

Activities	Original budget 2019/20 SEK/ETB (1SEK=3.13922 ETB)	APM budget 2019/20 SEK/ETB: (1SEK=3 ETB)	Difference 2019/20 SEK/(ETB)	APM budget 2019/20 (in SEK)	Some Explanation and Revision due to COVID_19
International conference	313,922.00	300,000.00	13,922.00	100,000.00	It was planned to conduct in May 2020, but cancelled and post ponded .And it can be transferred to 2020/21 if COVID is managed.
Data collection costs for regular research seminar series	1,569,610.00	1,500,000.00	69,610.00	500,000.00	For regular seminar series, we could not collect data from different offices as they are closed so that we shift to use secondary data, instead of primary data, to produce 8 research papers within the same thematic areas.
EFMD accreditation process	156,961.00	150,000.00	6,961.00	50,000.00	it is still not effected
Office material and software		867,000.00	(867,000.00)	289,000.00	We are in the process of purchasing video conference equipment, but the price is very expensive and above the budget. We have asked this issue so many time in the APM meetings. Taking this opportunity, We kindly ask your good office to purchase the video conference equipment (Birr 1.5 million, around SEK 500) from the unused budget (Ethiopian Professors trips and allowance) which is more than enough to cover. Kindly allow us to do so.
Economics and management SIDA activities coordinator salary	-	252,000.00	(252,000.00)	84,000.00	The coordinator is already recruited and has started working and organizing the office at the college of CoBE.
Sub Total	3,552,341.35	4,513,800.00	(961,458.65)	1,504,600.00	

Table 17: Summary of activities and budget not used in 2019-20, Unfinished Activities Due to COVID-19

No.	Activities	Unused Budget (Birr)
1	2nd round trip for supervision to economics and management PhD students to JIBS has been cancelled due to COVID19 spread	552,000.00
2.	2nd round trip for supervision to PhD economics students to UG has been cancelled due to COVID19 spread	144,000.00
3.	PhD course delivery for batch 5 Management PhD students is cancelled due to COVID 19	96,000.00
4.	Air ticket for the 2nd round visits by Ethiopian Professors to JIBS have been cancelled	300,000.00
5.	Air Ticket for the 2nd round visits by Ethiopian Professors to UG have been cancelled	48,000.00
6.	Air ticket for the 2nd round visits by Ethiopian Professors to JIBS have been cancelled	618,750.00
7.	Air Ticket for the 2nd round visits by Ethiopian Professors to UG have been cancelled	148,500.00
8.	The training which was scheduled by AAU and JIBS staff (for staff and PhD students) could not be delivered due to a restriction on gathering and international trips.	225,000.00
9.	9 staff for CDI were selected. But all trips have been cancelled due to flight restrictions	1,108,800.00
10.	Flights for Career Development Initiative were cancelled	192,000.00
11.	Travel costs for Post in JIBS Doc in management for 3 staff for post doc were selected. But all trips have been cancelled due to flight restriction	72,000.00
12	Travel cost for Post Doc in JIBS in Economics for 2 staff for post doc were selected. But all trips have been cancelled due to flight restriction	48,000.00
13	Travel costs for Post Doc in UG at UGOT in economics for one staff for post doc were selected. But all trips have been cancelled due to flight restriction	24,000.00
14	International conference was planned to conduct in May 2020, but cancelled	300,000.00
15	Budget for regular seminar series has not be used fully though process of selection and proposal submitted	1,500,000.00
16	We are in the process of purchasing video conference equipment, but the price is very expensive and above the budget. We have asked this issue so many times in the APM meetings.	867,000.00

Remarks:

In addition, AAU Management and Economics would like to bring to your kind attention regarding the Office material and software budget procurement. The procurement activity is in the process of purchasing video conference equipment, but the price is very expensive and above the budget. We have raised this issue many times during the APM meetings. Given that many of the budget lines are not exploited (due to the outbreak of the COVID 19), we kindly ask your good office to consider the budget increases for the purchase of the video conference equipment (Birr 1.5 million, around SEK 500) from the unused budget (for example, Ethiopian Professors trips and allowance). The College of Business and Economics has no single Video conferencing facility. As a result, we couldn't provide the virtual communication system for our PhD students, in particular, to make them expedite their thesis work for completion. And, we are also asking your good office to transfer the unused budget to the next year 2020-2021 to address activities stuck in the pipe lines.

4. International and Comparative Education PhD Program

4.1 Background

Addis Ababa University (AAU) launched a PhD program in International and Comparative Education in the second semester of 2010/11. In June 2014 AAU decided to establish a Centre for Comparative Education and Policy Studies (CCEPS) in order to run and manage the program. This centre is organized under the auspices of the College of Education and Behavioural Studies with a mission to study educational systems, policies, reforms, innovations and outcomes in international and comparative perspectives. Since its establishment, CCEPS has admitted five cohorts of students to its PhD programme. AAU has prioritized the continuation of the PhD programme in International and Comparative Education in connection with the AAU-Sweden Research Cooperation Programme, “Support to research training and capacity building at Addis Ababa University 2018–2023”.

This 2019/2020 technical report to Addis Ababa University, SIDA projects coordination office, contains a brief description and an analysis of the Research Training Partnership Programme in International and Comparative Education for the period.

4.2 Activities Planned and Accomplishment in 2019/2020

4. 2.1. AAU, CCEPS Doctoral student visit to university of Gothenburg in Sweden

During the 2019/2020 project year, CCEPS has planned to send 21 PhD students to the University of Gothenburg to engage in their PhD thesis work which is at different stages. The following table summarizes planned activities from the PhD students at different cohorts during their stay in Gothenburg.

Table 18: PhD students at different cohorts

No.	Cohort	Number of Students	Number of Visits planned in 2019/2020	Number of Visits achieved in 2019/2020	Planned Activity During Stay in Gothenburg
1	Cohort 2	5	5 in autumn semester	5	Write of the final manuscript
2	Cohort 3	8	8 in autumn semester	8	Write of the final manuscript
3	Cohort 4	4	8 (4 visits in the autumn semester and 4 in the spring semester)	3 visits in autumn	Preliminary data analysis and preparation for advanced research seminar I (upgrading seminar) during autumn visit and write up of the final manuscript during the spring visit
Total		21		16	

Due to various reasons the number of students that CCEPS managed to send to the University of Gothenburg during the first half of 2019/2020 project implementation period (autumn semester) was 14. Failure to fulfill Swedish visa regulation was reason for 2 students from cohort 3 to fail to visit Gothenburg, while failure to fulfill CCEPS requirement to travel to Gothenburg was reason for 1 student from cohort 4 not to travel to Gothenburg University. However, after clearing Swedish visa regulations requirements the 2 students who could not travel due to the same reason made their travel to university of Gothenburg in the spring semester. In addition to the 2 students from Cohort three whose travel was organized in the spring semester, CCEPS had also finalized all the travel arrangement for the 4 cohort four students to travel to university of Gothenburg in spring. However, due to Covid-19 related

travel restriction, the PhD students were not able to make the travel. As the result CCEPS achieved to implement 16 travels out of the planned total of 21 travels for PhD students.

Those students who visited Gothenburg University engaged in the activities as per the joint plan of CCEPS and University of Gothenburg. The progress of the students was monitored and evaluated using various mechanisms including seminar examinations; supervisors meetings in Gothenburg and Addis Ababa; coordinators meetings through email, online video discussion platforms, and face-to-face meetings in Gothenburg and Addis Ababa; and meetings and consultations with PhD students in Gothenburg and Addis Ababa. The results of the monitoring and evaluation have shown that PhD students stay in Gothenburg was fruitful in pushing PhD students towards the completion of their PhD studies. All the 3 cohort four students who stayed in Gothenburg have presented their preliminary analysis in the upgrading seminar in November 2019. The evaluation results of the cohort four students thesis have shown that students have made tremendous progress during their stay in Gothenburg.

After the outbreak Covid-19 and the related restrictions, CCEPS and Gothenburg university coordinators were engaged in series of virtual meetings to discuss on the progress of students supervision, to organize defense for those students who submitted their dissertation for examination, to develop and submit an updated project plan for 2020/2021 for SIDA projects coordination office and other matters.

As the result tremendous hard work from AAU and Gothenburg University, 5 PhD students from cohort two and three have submitted their thesis for defense. Out of the five, at the moment of writing this report, three have successfully defended their thesis and got their PhDs. CCEPS is also finalizing preparations to organize defense for the two PhD students who have submitted their thesis, and tentatively the defense is scheduled for the month of August, 2020.

4.2.2. Visiting Ethiopian supervisors to university of Gothenburg

During the 2019/2020 project implementation period CCEPS has a plan to organize 11visit for Ethiopian supervisors to the University of Gothenburg. However, CCEPS was able to implement 5 visits in two rounds in the months of November and December, 2019. The remaining visits were not organized due to Covid-19 related travel restriction for the PhD students and also for the Ethiopian staff. During those visits which were undertaken in the

autumn, CCEPS staffs were able to involve in joint supervision of PhD students with their Swedish counterparts, undertake seminar examinations, and participate in supervisors meetings. One staff member from CCEPS has presented his ongoing research work in an open seminar in the University of Gothenburg. This has contributed in promoting research culture at CCEPS.

4.2.3. Academic international conference for doctoral students and academics

CCEPS together with University of Gothenburg Department of Education and Special Education organized an academic international conference for International and Comparative Education doctoral students and academics on December 13 and 14, 2019 in Addis Ababa. The conference was attended by 55 guests from Ethiopia, Sweden and USA. The conference proceeding included 2 key note speeches by renown scholars in the field international and comparative education from University of Wisconsin Madison in USA and University of Uppsala in Sweden; 15 conference papers presented by PhD students and academics from Addis Ababa University and Gothenburg University; and Swedish cultural show was performed by the Swedish academics who participated in the conference.

The conference opening ceremony was attended by the Minister for Federal Democratic Republic of Ethiopia Ministry of Education; Dean of College of Education and Behavioral Studies from Addis Ababa University; Counselor and Head for research partnership programs from Swedish Embassy in Addis Ababa; and Coordinator for the SIDA Projects Coordination Office from Addis Ababa University. The international conference was successful in many ways including, among others, achieving what was planned, the quality of papers and, above all, the discussions made and experiences shared among the participants of the conference.

Using the opportunity of the international conference one of the key note speakers and World known scholar in the field of Comparative Education, Professor Thomas Popkewitz from University of Wisconsin Madison in USA has made a public lecture in Addis Ababa University for PhD students and academic staff of the University. The attendance and participation during the public lecture was very high. It was expressed in the conference that some of the joint presentations of conference papers by the supervisors are and their PhD students will be published in reputable international journals.

4.2.4. Visiting Swedish Supervisors to Addis Ababa University

During the 2019/2020 project year 19 GU supervisors' visits were planned (17 for the autumn semester and 2 for the spring semester). In autumn semester in two rounds 10 Swedish supervisors were able to visit Addis Ababa University, Center for Comparative Education and Policy Studies (CCEPS). 90% of these visits were combined with the visit to Addis Ababa for an academic international conference so as to minimize cost and efficiently utilize existing small funds for both purposes. As mechanism to achieve both purposes of supervision and conference participation dates of stay for in Addis Ababa for the Swedish professors was extended some days beyond the actual international conference dates. The remaining visits from the autumn semester and visits planned for the spring, although all were scheduled for the spring semester of 2019/2020, due to Covid-19 related travel restriction, they were not implemented.

4.2.5. Supervision by Swedish Researchers

PhD students from CCEPS have got continues supervision from Swedish supervisors in Sweden and Addis Ababa and also in different modalities including several face-to-face meetings, supervision by using online platforms including email and video assisted discussion, and in supervisors meetings held in Gothenburg university and Addis Ababa University. Such intensive engagement of Swedish supervisors with the PhD students is contributing to improving the quality of the PhD thesis that students are working on, monitoring the progression of the students and ultimately meeting international standards.

Beginning from Covid-19 restrictions on face-to-face meetings and travel restriction, joint supervisions between Ethiopian staff and staff from the University of Gothenburg have continued using virtual platforms including zoom, Google meet, email exchanges and other application depending on the availability and preference of the platforms both for the supervisors and students. Although, it is challenging to undertake virtual supervision due to internet connectivity problems from Ethiopia and cost for the connections from home both for Ethiopian staff and students, there were real commitments to do whatever is possible to help the PhD students' progress forward. Coordinators from CCEPS and Gothenburg University have tried to keep the supervision active through various mechanisms of monitoring including phone calls, emailing, and some face-to-face discussions.

4.2.6. Support to PhD student with disabled child

A financial support for PhD student with a disabled child who was not able to travel to Sweden to work closely with his Swedish supervisor and using Gothenburg university resources was meant to be offered in the 2018/2019 project year. However, due to delays created as the result of collecting the relevant documentation that can attest the actual expenses of connectivity of the student with the Swedish supervisor and a child care expenses that he incurred so as to get time and concentrate in his PhD job, the payment was effected in the first half of 2019/2020 as roll over activity from 2018/2019 project year.

4.2.7. Female students support

In this research training partnership project supported by SIDA, CCEPS has female PhD students' subsistence support as one of the activities for the project year 2019/2020. This support is meant to achieve that the three female PhD students included in the SIDA support scheme will complete their studies as per the program schedule and hence, contribute to gender balance in the field of International and Comparative Education. This activity was effectively implemented and all the three female PhD students have received the support. Currently all the three female PhD students are making good progress in their study.

4.2.8. Language check (PhD Thesis Language Editing)

This activity is meant to improve the quality of best PhD dissertations produced and successfully defended by students who are participants/beneficiaries of this research partnership project for online and open access publication using Addis Ababa University e-library facilities. The implementation of this activity is totally dependent on the successful defense of PhD thesis and completion of PhD study. And the language editing happens after all these processes. As thesis defenses were organized around the end of the project year, this project activity was not implemented in the 2019/2020 project year.

4.3. Challenges Encountered

Despite the successes registered in the student supervision mentioned above there were challenges encountered in the course of running the program. Some of the challenges include:

- The biggest challenge that affected many activities scheduled for the spring semester of the 2019/2020 project implementation period was Corona Virus pandemic related travel and work restrictions. As the result, almost all travels scheduled for the period were not implemented. CCEPS and Gothenburg University have tried to bridge the gap using virtual platforms to undertake some of the activities.
- There is still a space problem at Addis Ababa University. There are no adequate rooms and facilities for both the visiting professors and PhD candidates for smooth conduct of both academic and research activities. The Centre has offices and small working spaces dispersed in many building in the main campus of the AAU which has created problems for coordination and effective use existing meagre resources.
- The Centre has no secretary or administrative assistance and this has created an overwhelming burden of jobs on the Centre, which in some cases is beyond the capacity of single individual to handle.
- The Centre aspires to be a regional hub for Africa in the field of study as per the agreement document. There should be some mechanism of involving African and regional scholars towards that.

4.4. Suggestions for further improvement and conclusion

In the light of the challenges mentioned above the following suggestions need to be considered in the next period of our cooperation from both sides- the SIDA and Addis Ababa University.

In order that the Centre develops in to a full-fledged Centre pursuing academic and research activity it should be given autonomous status at the University like other Centres in the University.

The students must be equipped with adequate ICT knowhow for their research, and should be able to have adequate ICT facilities which seem to be not adequate at the Centre. Offices and office facilities should also be available for both visiting professors and students at the AAU adequately.

To manage the partnership project activities from CCEPS properly considering employment of project assistant and office secretary has paramount importance. These personnel can facilitate and follow-up project activities timely and with better quality.

Table 19:Result Based Management International and Comparative Education July 2020

Types of outputs expected	Outcomes expected (including targets)	Time	Performance indicator of outcome	Cost (SEK for Swedish side and ETB for Ethiopian side)	Variance analysis	Outcome result observed in 01 July 2019 to 30 June 2020	Outputs produced in year to obtain outcomes	Remark
Objective 1: - To support teaching and supervision of doctoral students in ICE with academic staff of AAU/CCEPS and GU/IPS								
-A clear partnership program coordination structure established	-A functional coordination structure involving both AAU and GU established;	01.07.2019 to 30.06.2020	-partnership program coordinator regular updates via email, zoom meeting and Google meet -Number of coordination meetings		-Progress of 8 cohort two and three students is affected by Corona virus related restrictions, interruptions and personal panic. -4 cohort four students visit to University of Gothenburg was interrupted due to Corona virus related travel restrictions and that has affected possibility of using Gothenburg University resources for write-up and face-to-face supervision from Gothenburg University supervisors.	-5 cohort two and three students have submitted their final dissertation for examination and among these three have defended their dissertation and completed their studies. Defense is scheduled for the remaining 2 students for August, 2020. -The remaining 8 cohort two are expected to submit their dissertation before the beginning of the first semester of 2020/2021. -4 cohort four students progressed from seminar III to seminar IV and currently working on seminar IV according to the program requirement.	-Frequent emails and updates were conducted between CCEPS and GU coordinators -2 coordinators meetings were conducted	-A clear partnership program coordination structure established

AAU-Sida Projects 2019/2020 Technical Report

Types of outputs expected	Outcomes expected (including targets)	Time	Performance indicator of outcome	Cost (SEK for Swedish side and ETB for Ethiopian side)	Variance analysis	Outcome result observed in 01 July 2019 to 30 June 2020	Outputs produced in year to obtain outcomes	Remark
Objective 2: To carryout academic exchange programs for PhD students to do part of their research using Gothenburg University facilities and institutional environment								
-28 ICE PhD students visit GU and stay for three months; -3 female PhD students provided subsistence support; -1 PhD student having a disabled child provided financial support.	-13 cohort two and three students visited GU during the first semester of 2019/2020 (Autumn semester) for three months and got access to library resources and opportunity to work closely with main supervisors from GU. -3 cohort four students visited GU one round for three months and got access to library resources and opportunity to work closely with main supervisors from GU. -3 female PhD students were	01.07.2019 to 30.06.2020	-Number of students travels -Number of female students benefited from subsistence support and number of months the support paid		-1 PhD student from cohort four did not travel to Gothenburg University during the first semester/Autumn semester because the students did not meet CCEPS requirements to proceed to Seminar IV. -Second round visits of 4 cohort four students to the University of Gothenburg was interrupted after all travel arrangements were made including air ticket purchased due to Covid-19 restrictions.	-5 cohort two and three students have submitted their final dissertation for examination and among these three have defended their dissertation and completed their studies. Defense is scheduled for the remaining 2 students for August, 2020. -The remaining 8 cohort two are expected to submit their dissertation before the beginning of the first semester of 2020/2021. -4 cohort four students progressed from seminar III to seminar IV and currently working on seminar IV according to the program requirement.	-16 students travels to GU were conducted -3 female students have got subsistence support for 10 months each in the academic year of 2019/2020.	-28 ICE PhD students visit GU and stay for three months; -3 female PhD students provided subsistence support; -1 PhD student having a disabled child provided financial support.

Types of outputs expected	Outcomes expected (including targets)	Time	Performance indicator of outcome	Cost (SEK for Swedish side and ETB for Ethiopian side)	Variance analysis	Outcome result observed in 01 July 2019 to 30 June 2020	Outputs produced in year to obtain outcomes	Remark
	additional given financial assistance to support their living expenses.							
Specific Objective 3: To develop research in order to link the students' research to the needs of the socio-economic development								
High quality and relevant PhD thesis to the socio-economic needs of Ethiopia are discussed and produced.	Increased insight by 17 doctoral students about the socio-economic needs of Ethiopia; PhD students international experience enhanced; Inbreeding of program avoided; Quality of PhD training in CCEPS improved	01.07.2019 to 30.06.2020	-Progress of doctoral students through series of seminars in the PhD curriculum		-Progress of 8 cohort two and three students is affected by Corona virus related restrictions, interruptions and personal panic. -4 cohort four students visit to University of Gothenburg was interrupted due to Corona virus related travel restrictions and that has affected possibility of using Gothenburg University resources for write-up and face-to-face supervision from Gothenburg University	-5 cohort two and three students have submitted their final dissertation for examination and among these three have defended their dissertation and completed their studies. Defense is scheduled for the remaining 2 students for August, 2020. -The remaining 8 cohort two are expected to submit their dissertation before the beginning of the first semester of 2020/2021. -4 cohort four students progressed from seminar III to seminar IV and currently	-5 PhD students have submitted their dissertation for defense -3 PhD students have successfully defended their dissertation using virtual platforms -8 PhD students are currently working on their final comments from their supervisors and all are due to submit their dissertations for defense before October,	High quality and relevant PhD thesis to the socio-economic needs of Ethiopia are discussed and produced.

AAU-Sida Projects 2019/2020 Technical Report

Types of outputs expected	Outcomes expected (including targets)	Time	Performance indicator of outcome	Cost (SEK for Swedish side and ETB for Ethiopian side)	Variance analysis	Outcome result observed in 01 July 2019 to 30 June 2020	Outputs produced in year to obtain outcomes	Remark
					supervisors.	working on seminar IV according to the program requirement.	2020. -5 seminar examinations were undertaken. -Access to GU library resources for CCEPS PhD students was facilitated using funds from GU-overhead cost.	
High quality and relevant PhD thesis to the socio-economic needs of Ethiopia are discussed and produced.	Increased insight by 17 doctoral students about the socio-economic needs of Ethiopia; PhD students international experience enhanced; Inbreeding of program avoided; Quality of PhD training in CCEPS improved	01.07.2019 to 30.06.2020	-Progress of doctoral students through series of seminars in the PhD curriculum				- Uninterrupted supervision was provided for 17 PhD students during their stay in Addis Ababa University and in Gothenburg University; -4 CCEPS staff visited Gothenburg University, department of education and special education in in	

AAU-Sida Projects 2019/2020 Technical Report

Types of outputs expected	Outcomes expected (including targets)	Time	Performance indicator of outcome	Cost (SEK for Swedish side and ETB for Ethiopian side)	Variance analysis	Outcome result observed in 01 July 2019 to 30 June 2020	Outputs produced in year to obtain outcomes	Remark
							<p>the first semester/Autumn semester of 2019/2010; -AAU staff together with GU staff involved in 5 PhD students seminar paper reviews and examinations; -1 CCEPS staff seminar paper presentations were undertaken in Gothenburg University; -2 supervisors' meetings were conducted at AAU and Gothenburg University; -10 GU staff visited CCEPS in two rounds were conducted;</p>	

AAU-Sida Projects 2019/2020 Technical Report

Types of outputs expected	Outcomes expected (including targets)	Time	Performance indicator of outcome	Cost (SEK for Swedish side and ETB for Ethiopian side)	Variance analysis	Outcome result observed in 01 July 2019 to 30 June 2020	Outputs produced in year to obtain outcomes	Remark
Academic international Conference conducted at CCEPS and contributions of Ethiopian researchers to the research field of international and comparative education improved; Improved academic engagement at CCEPS.	<p>Research papers from the partnership disseminated to an international audience</p> <p>Research papers from the partnership enriched through input from international participants</p> <p>Quality of PhD education at CCEPS improved.</p>	01.07.2019 to 30.06.2020	<p>-Number of papers presented in the conference</p> <p>-Number of international and local participants in the conference;</p> <p>-Attendance and conference proceedings.</p>			<p>The international conference was successfully conducted. Renowned scholars in the field of comparative education from the USA and Sweden participated in the conference together with Ethiopian participants.</p> <p>-High level officials from Ministry of Education (MoE), the Higher Education Strategic Center (HESC), Higher Education Quality Assurance Agency (HERQA), and SIDA participated in the conference.</p>	<p>-2 keynote speeches were delivered by scholars from University of Wisconsin Madison in USA and Uppsala University of Sweden.</p> <p>-15 conference papers were presented by CCEPS staff, GU staff and ICE PhD students.</p>	

II. Support to Research Training and Capacity Building

5. Sida Projects' Coordination Office (SPCO): Annual Report/ Achievements of 2019/2020

5.1.1. The SPCO timely prepared and submitted its annual procurement plan to AAU Procurement Directorate. Remaining procurement activities from 2018/2019 budget year have been followed up and five uninterruptible power sources (UPS) were purchased from the previous year budget.

5.1.2. For the project periods of 2013-2018 (the old agreement) and 2018-2019 (the first budget year of the new agreement), financial documents were audited by a Certified Audit firm that was selected based on the agreement of the Embassy of Sweden in Addis Ababa. The audit report submitted to the Embassy of Sweden and President of AAU.

5.1.3. As per the project cycle, the annual review meeting was held at Ghion Hotel from 04 to 05 November 2019 in the presence Minister Counselor Annika N. Jayawardena and Counselor Dr. Per Sevastikof the Embassy of Sweden in Addis Ababa, Professor Brook Lemma, coordinator at the SPCO and delegate of Professor Tassew Woldehanna, AAU President, representatives from Swedish partner Universities and AAU staffs. Higher officials from Embassy of Sweden and AAU forwarded their appreciations on the progresses of the programs and gave valuable comments for the improvement of future performances. Original plans and newly proposed activities, accomplished activities in 2018/2019 and problems encountered were raised during the discussion session.



Fig. 30: Left to right: Minister Counselor Annika N. Jayawardena, Professor Brook Lemma of SPCO of AAU and Counselor Dr. Per Sevastik of the embassy of Sweden in Addis Ababa at the Annual Review Meeting Ghion Hotel 04 and 05 November 2019. The image in the left presents Counselor Dr. Per Sevastik as he discussed some of the issues raised at the annual review meeting.

5.1.4. The SPCO in collaboration with SLU, Sweden, organized an excel training for five consecutive days; half day for each group. A Total of 37 AAU staffs were trained from different departments; Finance, Human resource, procurement directorate, Project PIs and SPCO staffs, including the coordinator, Professor Brook Lemma.



Fig. 31: Captured activities from the above mentioned excel training conducted on 11 and 13 December 2019

5.1.5. AAU- Sida 40th Anniversary: the 40th AAU-Sida research collaboration anniversary is scheduled to be celebrated in the coming May 2020. Following the schedule, Sida Projects Coordination Office conducted a meeting in the presence of Mrs. Anita Sandstrom, the Swedish commissioned Organizer and other concerned parties. On the meeting, the program reviewed and some additional comments given to be incorporated in the program. Sida

Projects' Coordinator; organized a committee with 5 members. Besides, SPCO coordinator; Professor Brook Lemma is communicating with the commissioned Swedish organizer and Dr. Per Sevastik, Councilor at the Embassy of Sweden in Addis Ababa.

So far the following activities have been done:

- Final draft program has been prepared
- The invitation letter has been distributed to Swedish partners.
- SPCO is collecting lists of the invitees from Ethiopia side,
- SPCO coordinator has been communicating the presenters and the organizer since August 2019,

5.1.6. SPCO announce for the PI's to submit their annual report 2019/2020 and Plan for 2020/2021 and starting to collect the documents from departments.

5.1.7. SPCO processed pending payments and closed annual financial budget year 01 July 2019 to 07 July 2020.

5.2. Challenges

5.2.1. Resignation of Assistant Controller in February 2020,

5.2.2. Following Covid 19 pandemic outbreak in March, the 40th AAU-Sida anniversary and annual planning meeting schedules to be taken in the month of May, were cancelled due to COVID-19 restrictions.

5.2.3. Resignation of one of SPCO staff who works at the position of Head Controller, in April 2020,

5.2.4. Long Procurement Process for purchasing office supplies and office equipment,

5.2.5. Delay of payments for Female and disabled MA Students (pocket money) due to COVID-19 restrictions.

5.2.6. Some Management & Economics PhD Students, who had been traveled to Sweden for their course and research work, were enforced to be returned to Ethiopia due to COVID 19.

5.3. Action taken to solve the challenges

5.3.1. SPCO in collaboration with Human Resource Management and Development Office recruited New Assistant Controller for the same position.

5.3.2. To fill the gap for the position of Head Controller, SPCO temporarily assigned AAU Project Finance Head, Mr. Belaynew Mengistu as Acting Controller, until the new staff being recruited. The process of new staff for the position has been postponed due to state of emergency for COVID 19/ Global pandemic.

- 5.3.3.** Students who came from Sweden were challenged, but SPCO in collaboration with the department of Economics, Swedish Partners and Sida, facilitated things for the students.
- 5.3.4.** SPCO facilitated a good number of payments even if there is a challenge of COVID 19 Pandemic restrictions.
- 5.3.5.** SPCO collaborating with AAU Budget and Finance and Project Finance Office, made all payments to be in electronic payment, to avoid personal contact due to the threat of COVID 19 pandemic.
- 5.3.6.** After a frequent virtual meeting & mail discussion with Side representative, the 40th AAU-Sida anniversary and annual planning meeting schedules postponed for 2020/2021 project period.
- 5.3.7.** SPCO announced the decision to all participants about the cancelation of the program in advance so that the participants can reschedule their program.

AAU-Sida Projects 2019/2020 Technical Report

Annual activity / procurement Reports: 01 July 2019 to 30 June 2020 (NOTE: All ETB costs were payable in Ethiopia while SEK are in Sweden.

Table 20: Result Based Management of the SPCO

Planned Activity / Procurement	Planned Time	Outcome expected including targets	Performance indicator of outcome	Cost	Outcome result observed in 01 July 2019 to 30 June 2020	Activities done in year to obtain outcome	Remark
Sida project coordination office staff salary	1 July 2019-30 June 2020	8 SPCO staffs perform all planned activities for the specific period, as per the agreement	8 SPCO Staffs	2,809,332.00	7 SPCO staffs have been working to meet expected outcome	Technical and Financial Reports and other office activities have been done	1 head report writer and 1 head controller to be employed. (To replace head controller who resigned in April 2020) to be employed.
Office supplies for Word processors and refreshments	1 July 2019-30 June 2020	4 financial , 4 technical reports plus one external audit report and 2 annual meeting minutes	12 toners (for printers and copier) 10 boxes paper Maintenance twice per year and two over lunch meetings per month	120,000 .00	1 Technical report, 1 Financial report, 2 external audit reports, annual review meeting, compiled minute and other office activities done during the first six month	Annual Purchasing plan submitted to procurement directorate. Five UPS purchased.	Activities done with office Supplies procured in 2018/2019 budget year. Five UPS, four expert chairs and 1refregator were purchased from last year's remaining budget. Toners and other stationary materials procurement couldn't be effective.
Annual external auditing	1 July 2019-30 June 2020	Auditors invited and 2 Annual audit report	2 Audit reports	600,000.00	2013-2018 and 2018/2019 Audit reports generated and Announcement by the purchasing department to Invite auditors for Bid for 2019/2020	Preparing TOR, request purchase for Auditors Preparing financial reports & documents to be audited.	Procurement office has been processed to purchase audit service for 2019-2020 Project Period.
Annual meetings	1 July 2019-30 June 2020	Two meetings to Discuss on the Activity plan, Disbursed budget expected result, with 4 partnership projects at AAU and Sweden and	1 Annual meeting	267120.00	1 Annual meeting Conducted	1 Annual meeting held on November /2019 at Ghion Hotel	Annual planning meeting couldn't be conducted per the schedule due to COVID 2019; It will be conducted as soon as the e the Global Pandemic

AAU-Sida Projects 2019/2020 Technical Report

Planned Activity / Procurement	Planned Time	Outcome expected including targets	Performance indicator of outcome	Cost	Outcome result observed in 01 July 2019 to 30 June 2020	Activities done in year to obtain outcome	Remark
		13 beneficiaries of the Research Capacity Building Project under SPCO and the annual report per the schedule in the document					threat gets solution.
Training for SPCO Staffs	1 July 2019-30 June 2020	Excel training for staff from the finance and other departments involved in the program. Individual training for key financial staff at SPCO and financial office.	1Excel training provided by Swedish professors for AAU staffs.		A half day Excel training for 37 AAU staffs from Finance, Procurement, Human resource ,for Project PIs, SPCO staff and other beneficiaries	Preparing training rooms, identifying trainees, booking Hotels for trainers, preparing printing and distributing course modules and compile the assessment of training evaluation; filled by the trainees.	

Table 21: Annual Activity/Procurement Report, Responsible center/ person: SPCO

Activity/Procurement	Date of announcement/ requesting Purchase	Date of Examination / Planned date to do the activity	No. applicants/ No. of Items requested	Selected person/ Item purchased	Date of employment/ receiving purchased Item	Requested budget	Used budget	Remark
SPCO staff monthly budget (salary)	1 July 2019-30 June 2020	1 July 2019-30 June 2020	8 SPCO staffs	7 SPCO staffs	1 July 2019-30 June 2020	2,809,332.00	1,725,470.67	Head controller resigned in April 2020, since then Project Finance Manager assigned temporarily. 1 report writer has not been employed.
Procurement of Materials for SPCO office	01 July 2019 - 30 June 2019	-		12 toners (for printers and copier) 10 boxes paper Maintenance twice per year Tea/coffee and 3 lunch meetings	-	120,000.00	-	On procurement process.
Annual external Auditing	1 July 2019-30 June 2020		2 Audit reports	Auditing 2013-2018 and the first year of the new project period which is 2018/2019	From November 2019 to June 2020			
Annual Review	1 July 2019 -31	07-08	1 Annual	Conference hall	04/05			

AAU-Sida Projects 2019/2020 Technical Report

Activity/Procurement	Date of announcement/requesting Purchase	Date of Examination / Planned date to do the activity	No. applicants/ No. of Items requested	Selected person/ Item purchased	Date of employment/ receiving purchased Item	Requested budget	Used budget	Remark
meeting	December 2019	Nov/2019	planning review meeting	rent, Lunch, 2refreshments, Stationery and Facilitation	November 2019			
Training for SPCO Staffs	1 July 2019 -31 December 2019	December 2019	1 Excel training	1 Excel training	11 December to 13 December 2019	-		Payment for refreshment

6. Women Children and Youth Affairs Directorate

6.1.1. Executive Summary

The Office of Women, Children and Youth Affairs (OWCYA), Addis Ababa University (AAU) aspires to be an Office where gender equity and equality is realized and empowerment of women/girls is attained. The office works to create an environment where no gender stereotype exists and where all females are fairly being represented in all areas of the University's activities. Accordingly, the office has been planned different activities to mainstream gender policy particularly in AAU and generally in Ethiopia. Since 2018 to date and extend to 2023 the office has been working in collaboration with SIDA project to allocate budget to deliver different capacity building activities to attain this objective as well. Then we acknowledge SIDA project has given tremendous support for the office.

Meanwhile, in 2015 the OWCYA has developed a policy document to promote gender equity, equality at AAU and to provide strategies for addressing the challenges encountered in gender mainstreaming. In order to harmonize the Policy corresponding to the contemporary national, continental and global gender issues, it is found to revise the existing AAU's Gender Policy and develop implementation guidelines. Thus, the OWCYA of AAU after a long time interruption has been developed Revised Gender Policy and implementation Guide line documents successfully.

Life skills training, orientation training is one of the broad activities that brought gender equity and equality realized; and empowerment of women/girls in the AAU. However, most of the activities were not accomplished based on the plan due to current interruption. Other key activities of the office are Gender research supplies, Tracer Study; unfortunately, this activity couldn't be performed in June 30 /2020 because of Covid-19 (Emergency proclamation). This is therefore; we would like to plan ahead of time the program will be held by end of November /2020. To some up; the office has done some of the activities successfully based on its plan.

6.1.2. Activities done in 2019/2020

(a) Life skills training, orientation training of Trainees:

- **All college's and institutes undergraduate new entry students**

- **Summer in-service students**

Topics of life skillstraining:

- Academic skills
- Goal setting
- Assertiveness
- Time management,
- Communication skills
- Conflict resolution, stress management,
- Risky behavior, peer pressure; Reproductive health...etc)

6.1.3. Trainers Selection Criteria:

The trainers have been selected based on their education back ground thus Staffs of AAU and out of AAU who have MA and PhD with related education back ground and those have long experience; have excellent potential ;and most of the trainers' have been working from beginning of the program. Moreover, they have good motivations to share their campus life experiences for the trainees'. Gender sensitiveness and willingness to support the directorate is also other supplementary criteria set to select. However, ToT of life skills training is uncompromised criteria of selection.

6.1.4. Roles of Coordinators' and Facilitators':-

The Coordinators' and Facilitators of the training are responsible to prepare schedule, upload the training announcements, facilitated the provision of materials for trainees, facilitate training place and rooms, facilitate and serve refreshment, take attendances, etc.

5.2.5. Time of training: - Oct,26-27/2019, Nov,03/2019,Nov,10/ 2019, Nov,16-17/2019. Due to regular academic programs' overlap the training has been offered in the weekends.

6.1.5. Preparation of Revised Gender Policy and Implementation Guide lines

The office based on plan and allocated budget has been done proficient effectively.

6.1.6. Gender research supplies, Tracer Study

Outcome: As per the planned activities, the directorate of Women, Children and Youth affairs has been offered life skills training for new entry undergraduate students of all collages on

Oct,26-27/2019, Nov,03/2019,Nov,10/ 2019 and Nov,16-17/2019. Based on the feedback collected from students, the office supposed that the training was too important to empower newentry undergraduate students of the university by addressing the challenges that affect the academic performance and their social wellbeing in and off campus. Particularly, life skills training has been uphold them:-

- To increase self-awareness, self-esteem, self-confidence, and strengthen interpersonal skills and students reveals that it used them as stepping point to develop assertive behavior
- To be inspired to leadership particularly, female trainees inform that most of them were highly motivated
- To manage their time properly by preparing time daily time schedule
- To increase their communication (social skills) and increase their ability to cope with stress in a healthy manner.

More over the office recognized from their feedback that the trainees have been decided to work in order to put off sexual harassment in campus via standing for common well-being and protecting each other from harassment and sexual violence. Moreover, they have been aware to protect themselves and friends from drugs like chat, cigarette and alcohol that have been the main challenges of the campus students of the University. Students also get awareness about reproductive health and HIV/AIDS.

6.1.7. Budget utilization

Generally, 2965 students were participated on life skills training and 106 students took additional training on addiction, drug abuse and challenges and 29 stakeholders from the staff took ToT on Gender mainstreaming and leadership. Totally 3,100 peoples were participated.

- The expense for life skills training of Undergraduate new entry students is **230,300 in birr**
- The expense for life skills training of Summer In-service is **17,800 in birr**
- Total budget used (cost) for life skills training (awareness creation) via panel discussion is **42,670 in birr. This brings the total expenditure to 290, 770 ETB.**

6.1.8. Challenges

The directorate of Women, Children and Youth has been encountered different challenges throughout the implementation of the plan (in collaboration with Sida project) particularly to held the workshop for tracer study and continuous life skills training. For instance, Life skills training:

- Overlap of regular academic programs (class time) that made difficult to get free to offer training for all students thus we scheduled all programs in weekend.
- Lack of commitment that some colleges were not facilitate time for training soon
- Shortage of facility(like car to move training materials and trainers to different colleges')
- Lack of willingness of students to attend the training due to awareness gap about the important of life skills training.

Table 22:Annual activity/ Procurement Reports: 01 July to 30/2019 to June30/2020(Plan towards Result) of OWCYA (Gender Office)

Responsible center / person	Planned Activity / Procurement	Time	Outcome expected including targets	Performance indicator of outcome	Cost (SEK for Swedish side and ETB for Ethiopian side)	Outcome result observed in 01 July 2019 to 30 Dec 2019	Activities done in 1 year to achieve the planned outcomes
Women, children and youth Directorate Mrs. Matebie Tarekegn	Orientation /life skills training, harassment .etc	Oct,26 , 2019	Offering Life skills training on assertiveness and academic skills....	Offering awareness creation training for Education and brl studies students	Honorarium for Trainers, Coordinators & Facilitators =18,000.00(birr) Refreshment pay=1,620.00 birr) 19,620.00 Birr	Awareness creation training offered on Assertiveness -Academic skills -Risky behavior -Gender based violence Peer pressure for 42 F and 46 M and total 88	The topics for life skills training is identified from module, training time schedule was Prepare , trainers were selected by committee, the trainees(students) called from the colleges Refreshment and other essential facilities were facilitated Finally:- feedback of the training have been collected and we realized that the training helped them:- <ul style="list-style-type: none"> • Increase self-confidence, self-esteem & self-awareness • strengthen interpersonal skill & developing assertive bhr • Inspired to leadership • Manage their time properly by preparing daily time schedule • Increase their communication (social skills) & ability to cope with stress in a healthy manner
Women, children and youth Directorate Mrs. Matebie Tarekegn	Orientation /life skills training, harassment .etc	Oct,27 , 2019	Offering Life skills training on assertiveness and academic skills....	Offering awareness creation training for Commerce new entry students	Honorarium for Trainers, Coordinators & Facilitators =29,500.00(birr) Refreshment pay=3,330.00 birr) Total= 32,830.00 Birr	Awareness creation training offered on Assertiveness -Academic skills -Risky behavior -Gender based violence Peer pressure for 65 F and 35 M and total 100	The topics for life skills training is identified from module, training time schedule was Prepare , trainers were selected by committee, the trainees(students) called from the colleges Refreshment and other essential facilities were facilitated Finally:- feedback of the training have been collected and we realized that the training helped them:- <ul style="list-style-type: none"> • Increase self-confidence, self-

AAU-Sida Projects 2019/2020 Technical Report

Responsible center / person	Planned Activity / Procurement	Time	Outcome expected including targets	Performance indicator of outcome	Cost (SEK for Swedish side and ETB for Ethiopian side)	Outcome result observed in 01 July 2019 to 30 Dec 2019	Activities done in 1 year to achieve the planned outcomes
Women, children and youth Directorate Mrs. Matebie Tarekegn	Orientation /life skills training, harassment .etc	Nov,03, 2019	Offering Life skills training on assertiveness and academic skills....	Offering awareness creation training for AAiT New entry students	Honorarium for Trainers, Coordinators & Facilitators =39,500.00(birr) Refreshment pay=4,350.00 birr) Total= 39, 850.00 Birr	Awareness creation training offered on Assertiveness -Academic skills -Risky behavior -Gender based violence Peer pressure for 127 F and 200 M and Total 327	<ul style="list-style-type: none"> esteem & self-awareness strengthen interpersonal skill & developing assertive behavior Inspired to leadership Manage their time properly by preparing daily time schedule Increase their communication (social skills) & ability to cope with stress in a healthy manner <p>The topics for life skills training is identified from module, training time schedule was Prepare , trainers were selected by committee, the trainees(students) called from the colleges Refreshment and other essential facilities were facilitated Finally:- feedback of the training have been collected and we realized that the training helped them:-</p> <ul style="list-style-type: none"> Increase self-confidence, self-esteem & self-awareness strengthen interpersonal skill & developing assertive behavior Inspired to leadership Manage their time properly by preparing daily time schedule Increase their communication (social skills) & ability to cope with stress in a healthy manner

AAU-Sida Projects 2019/2020 Technical Report

Responsible center / person	Planned Activity / Procurement	Time	Outcome expected including targets	Performance indicator of outcome	Cost (SEK for Swedish side and ETB for Ethiopian side)	Outcome result observed in 01 July 2019 to 30 Dec 2019	Activities done in 1 year to achieve the planned outcomes
Women, children and youth Directorate Mrs. Matebie Tarekegn	Orientation /life skills training, harassment .etc	Nov,10, 2019	Offering Life skills training on assertiveness and academic skills....	Offering awareness creation training for Social Sciences College New entry students	Honorarium for Trainers, Coordinators & Facilitators =24,500.00(birr) Refreshment pay=3,030.00 birr) Total= 27,530.00 Birr	Awareness creation training offered on Assertiveness -Academic skills -Risky behavior -Gender based violence Peer pressure for 66 F and 116 M and Total of 182	The topics for life skills training is identified from module, training time schedule was Prepare , trainers were selected by committee, the trainees(students) called from the colleges Refreshment and other essential facilities were facilitated Finally:- feedback of the training have been collected and we realized that the training helped them:- <ul style="list-style-type: none"> • Increase self-confidence, self-esteem & self-awareness • strengthen interpersonal skill & developing assertive bhr • Inspired to leadership • Manage their time properly by preparing daily time schedule • Increase their communication (social skills) & ability to cope with stress in a healthy manner
Women, children and youth Directorate Mrs. Matebie Tarekegn	Orientation /life skills training, harassment .etc	Nov,10, 2019	Offering Life skills training on assertiveness and academic skills....	Offering awareness creation training for HLJC College New entry students	Honorarium for Trainers, Coordinators & Facilitators =16,500.00(birr) Refreshment pay=3,030.00 birr) Total= 19,530.00 Birr	Awareness creation training offered on Assertiveness -Academic skills -Risky behavior -Gender based violence Peer pressure for 93 F and 53 M and Total of 146	The topics for life skills training is identified from module, training time schedule was Prepare , trainers were selected by committee, the trainees(students) called from the colleges Refreshment and other essential facilities were facilitated Finally:- feedback of the training have been collected and we realized that the training helped them:- <ul style="list-style-type: none"> • Increase self-confidence, self-esteem & self-awareness • strengthen interpersonal skill & developing assertive bhr

AAU-Sida Projects 2019/2020 Technical Report

Responsible center / person	Planned Activity / Procurement	Time	Outcome expected including targets	Performance indicator of outcome	Cost (SEK for Swedish side and ETB for Ethiopian side)	Outcome result observed in 01 July 2019 to 30 Dec 2019	Activities done in 1 year to achieve the planned outcomes
Women, children and youth Directorate Mrs. Matebie Tarekegn	Orientation /life skills training, harassment .etc	Nov,16, 2019	Offering Life skills training on assertiveness and academic skills....	Offering awareness creation training for Business & Economic College New entry students	Honorarium for Trainers, Coordinators & Facilitators =48,500.00(birr) Refreshment pay=8,000.00 birr) Total= 56,500.00 Birr	Awareness creation training offered on Assertiveness -Academic skills -Risky behavior -Gender based violence Peer pressure for 632 F and - M and Total of 632	<ul style="list-style-type: none"> Inspired to leadership Manage their time properly by preparing daily time schedule Increase their communication (social skills) & ability to cope with stress in a healthy manner <p>The topics for life skills training is identified from module, training time schedule was Prepare , trainers were selected by committee, the trainees(students) called from the colleges Refreshment and other essential facilities were facilitated Finally:- feedback of the training have been collected and we realized that the training helped them:-</p> <ul style="list-style-type: none"> Increase self-confidence, self-esteem & self-awareness strengthen interpersonal skill & developing assertive bhr Inspired to leadership Manage their time properly by preparing daily time schedule Increase their communication (social skills) & ability to cope with stress in a healthy manner
Women, children and youth Directorate Mrs. Matebie Tarekegn	Orientation /life skills training, harassment .etc	Nov,17, 2019	Offering Life skills training on assertiveness and academic skills....	Offering awareness creation training for Health Science College New entry students	Honorarium for Trainers, Coordinators & Facilitators =32,000.00(birr) Refreshment pay=2,440.00 birr) Total= 34,440.00 Birr	Awareness creation training offered on Assertiveness -Academic skills -Risky behavior -Gender based violence Peer pressure for 45 F and 116 M and Total of 161	<p>The topics for life skills training is identified from module, training time schedule was Prepare , trainers were selected by committee, the trainees(students) called from the colleges Refreshment and other essential facilities were facilitated Finally:- feedback of the training have been collected and we</p>

AAU-Sida Projects 2019/2020 Technical Report

Responsible center / person	Planned Activity / Procurement	Time	Outcome expected including targets	Performance indicator of outcome	Cost (SEK for Swedish side and ETB for Ethiopian side)	Outcome result observed in 01 July 2019 to 30 Dec 2019	Activities done in 1 year to achieve the planned outcomes
							<p>realized that the training helped them:-</p> <ul style="list-style-type: none"> • Increase self-confidence, self-esteem & self-awareness • strengthen interpersonal skill & developing assertive behavior • Inspired to leadership • Manage their time properly by preparing daily time schedule • Increase their communication (social skills) & ability to cope with stress in a healthy manner
Life skills Facilitation Training for Summer In-service Students							
Women, children and youth Directorate Mrs. Matebie Tarekegn	Orientation /life skills training, harassment .etc	August, 2019	Offering Life skills training on assertiveness and academic skills....	Offering Facilitation training for Social Sciences College Summer In-service students	Refreshment pay is covered from gov't budget Honorarium for Trainers, Coordinators & Facilitators =8,400.00(birr) Total= 8,400.00 Birr	Facilitation training offered on Assertiveness -Academic skills -Risky behavior -Gender based violence Peer pressure for 147 Female facilitator and 82 Male facilitators and Total of 229	<p>The topics for life skills facilitation training is identified from module, training time schedule was Prepare , trainers were selected, the trainees(students) called from the colleges Refreshment and other essential facilities were facilitated Finally:- feedback of the training have been collected and we realized that:-</p> <ul style="list-style-type: none"> • They are able to facilitate life skills training for their respective elementary/high school's students when they back to work/teaching from their summer courses so as to the academic and Social problems of their respective school's

AAU-Sida Projects 2019/2020 Technical Report

Responsible center / person	Planned Activity / Procurement	Time	Outcome expected including targets	Performance indicator of outcome	Cost (SEK for Swedish side and ETB for Ethiopian side)	Outcome result observed in 01 July 2019 to 30 Dec 2019	Activities done in 1 year to achieve the planned outcomes
Women, children and youth Directorate Mrs. Matebie Tarekegn	Orientation /life skills training, harassment .etc	August, 2019	Offering Life skills training on assertiveness and academic skills....	Offering Facilitation training for Education & Bhrl studies College Summer In-service students	Refreshment pay is covered from gov't budget Honorarium for Trainers, Coordinators & Facilitators =9,400.00(birr) Total= 9,400.00 Birr	Facilitation training offered on Assertiveness -Academic skills -Risky behavior -Gender based violence Peer pressure for 28 Female facilitator and 75 Male facilitators and Total of 103	The topics for life skills facilitation training is identified from module, training time schedule was Prepare , trainers were selected, the trainees(students) called from the colleges Refreshment and other essential facilities were facilitated Finally:- feedback of the training have been collected and we realized that:- <ul style="list-style-type: none"> • They are able to facilitate life skills training for their respective elementary/high school's students when they back to work/teaching from their summer courses so as to the academic and Social problems of their respective school's
Women, children and youth Directorate Mrs. Matebie Tarekegn	Orientation /life skills training, harassment(Panel discussion)	Nov,8, 2019	Offering Life skills training on assertiveness , Leadership and harassment through Panel discussion	Awareness creating for the Whole community of Addis Ababa University	Refreshment pay =7,670.00 birr Honorarium for Trainers, Coordinators & Facilitators =35,000.00(birr) Total= 42,670.00 Birr	Awareness creation through Panel discussion held on Assertiveness Leadership Gender based violence(harassment, for 194 Female and 105 Male and Total of 299	The topics for Panel discussion for life skills awareness creation is identified from module, discussion time schedule was identified, Panelists were selected, the announcement is uploaded for interested participant in all campus, guests were invited. Refreshment and other essential facilities were facilitated

AAU-Sida Projects 2019/2020 Technical Report

Responsible center / person	Planned Activity / Procurement	Time	Outcome expected including targets	Performance indicator of outcome	Cost (SEK for Swedish side and ETB for Ethiopian side)	Outcome result observed in 01 July 2019 to 30 Dec 2019	Activities done in 1 year to achieve the planned outcomes
Women, children and youth Directorate Mrs. MatebieTarekegn	Validation for Revised Gender Policy & implementation on guide line preparation	It is started in 4 th quart of budget year	Selecting experts for guide line preparation		-		The document has been accomplished successfully on time. ¹
Women, children and youth Directorate Mrs. MatebieTarekegn	Gender Research center Supplies, Tracer Study		Pre- process and preparations has been stated		-		Due to current interruption the program will be held by end of October/2020.

¹The document will be printed by government budget by next year

Table 23:Result Based Management (RBM) OWCY (Gender Office)

Activity /Procurement	Out puts	Out comes	Performance indicators	Baseline	Planned/Result	Data sources	Data collection strategies	Assumptions
Objectives I: Improving academic performance and attrition rate of students via orientation and life skills training								
	Provide training for New entry students	Increase the academic performance of the students;	Increase number of graduate class students;	1636 New entry students are trained 2019(01 July to 30 December, 2019)	New entry students will be trained in 2019/2020	From Women, Children &Youth Affairs Directorate , and stack holders	Training attendance	Improved services and university female students graduate to be models for others by way of demonstrating their new accretive mindset
Objectives II: Enlarge female researchers’;								
	selected Graduate female scholarship students;& trace 4 Graduate female scholarship students to present their research	Participate female researchers’	Raise participate of female researchers’	-	selected Graduate female scholarship students;& trace 4 Graduate female scholarship students to present their research in 2020	From Women, Children &Youth Affairs Directorate	presentation workshop attendance	Promote the participation of female researcher’s of University
Objectives III: Empowering Women based on the Gender Policy implementation guidelines								
	Implementati on be developed by responsible persons and offices named M and E strategy developed	Users satisfaction from gender support ensured female student exercise their right	Improved services and university female students graduate to be models for others by way of demonstrating their new accretive mindset	0	Change of gender balance, gender policy improved from the exercise of implementation (feedback collected)	Based on guidelines from different stakeholders’ and Women, Children &Youth Affairs Directorate	Quarterly; monthly reports of different duties	M & E based on implementation of gender policy guidelines;

AAU-Sida Projects 2019/2020 Technical Report

Activity /Procurement	Out puts	Out comes	Performance indicators	Baseline	Planned/Result	Data sources	Data collection strategies	Assumptions
Objectives I: Improving academic performance and attrition rate of students via orientation and life skills training								
	strategy of user satisfaction methods developed resources for implementation							

7. Directorate for Special Needs Education/Special Needs Support Center

In the year from June 2019 to June 30 2020, the Directorate for Special Needs Education or Special Needs Support Center of Addis Ababa University had planned to implement some activities: empowerment skill training for students with disabilities, research on mental health and tracer study and improving computer service, network and some adaptation. These activities were planned to be carried out from January 2020- to June 30 2020. **In January and February, the center was able to complete preconditions for some activities such as announcement, selection of data collectors for research and tracer study and trainers for students with disabilities, data collection instrument development, peer reviewing the data collection instrument and duplication of data collection questionnaire.** In March due to COVID-19 situations and closings of Universities the center was not able to proceed on implementing what was planned. As a result these activities are included in the plan for July2020June 30/2021. The Special Needs Support Center couldn't use the budget allocated for 2019/2020 due to COVID-19 related university closing.

8. Directorate for Research

8.1. Background

Addis Ababa University has been implementing the AAU - SIDA bilateral research cooperation starting from 1 July 2018. During the 2019/20 academic year, a number of achievements have been made in Automation of Research Management System, Academic Staff Mobility of AAU and Grant Writing and Research Ethics Training for AAU Academic staff. The 2017/18 annual subscription fee of AAU Research Management System Software known as **Converis** was paid by Sida project. Accordingly, 32,000 Euro was paid for Clarivate Analytics/formerly known as Thomson Reuters/, the sole owner of Converis software. Consequently, AAU staffs have submitted over 2000 research articles published in reputable scientific journals and over 130 research proposals in user-friendly Converis.

Upgrading the capacity of junior faculty on grant writing proposal and research ethics is felt necessary in Addis Ababa University. AAU has made an arrangement with Gothenburg University to help in providing the necessary frames in AAU for sustainable upgrading of the faculty to fill the gap in research. This program will be implemented by AAU using the Swedish International Development Agency for Cooperation (Sida) fund, which is part of the agreement. As per the agreement reached with Sida, a total of 3,882,310 SEK was granted for three years. Five delegates from AAU travelled to Sweden, Gothenburg University from 06 December 2019 to 14 December 2019 to design and develop the course content of the training with Dr. Yonas Alem and other higher-level management of Gothenburg University.

8.2. Research Management System – Converis

Addis Ababa University has been implementing the AAU - SIDA bilateral research cooperation starting from 1 July 2018. During the 2019/20 academic year, a number of achievements have been made in Automation of Research Management System, Academic Staff Mobility of AAU and Grant Writing and Research Ethics Training for AAU Academic staff. The 2018/19 annual subscription fee of AAU Research Management System Software named **Converis** was paid by Sida project. Accordingly, 32,000 Euro was paid for Clarivate Analytics/formerly known as Thomson Reuters/, the sole owner of Converis software. Consequently, AAU staffs have submitted over 2000 research articles published in reputable scientific journals and over 130 research proposals

including Thematic Research, Adaptive Problem-Solving and Women Researchers using the software package

8.3. Training on Research Ethics and Grant Writing

Upgrading the capacity of early- and mid-career staffs of AAU on Grant writing proposal and Research ethics is felt necessary by the University. AAU in collaboration with Gothenburg University, Sweden, one of the top 50 universities globally, will organize “train the trainers” workshop on two separate but interrelated topics:

- Training on Research Ethics: **Feb 26th – March 3rd, 2020**
- Training on Writing Grant-winning Proposals: **March 4th – 10th, 2020.**

Thus, AAU made an arrangement with Gothenburg University, Sweden to jointly organize “train the trainer” workshop at AAU. Then, the trained staff will train other AAU staff members in the academic year. This program will be implemented by AAU using the Swedish International Development Agency for Cooperation (Sida) fund, which is part of the agreement. As per the agreement reached with Sida, a total of 3,882,310 SEK was granted for three years. Five delegates, namely, Dr. Mitike Mola, VPRTT, Dr. TadesseFetahi, Research Director, Prof. Damen H/Mariam, Public Health, and Mr. Habtamu Getinet, Assistant at Office of the Research Director, from AAU travelled to Gothenburg University, Sweden from 06 December 2019 to 14 December 2019 to design and develop the course content of the training with Dr. Yonas Alem and other higher-level management of Gothenburg University. Accordingly, the content of the training was developed and dates of the training were also fixed as indicated above.

Thus, after crafting a course outline together with the University of Gothenburg, training for trainers was conducted at *Bishoftu*. The training on Grant Writing Skills and Research Ethics was delivered by five Swedish Professors who came from the University of Gothenburg from Feb 28-March 10 at *Bishoftu*. Thus, from this training 50 senior professors from AAU were certified and has planned to give the same training for academic Staff at their respective college/research Institute.

8.4. Engaging female academic staff in research with Sida funding

The Office of the Director for Research in collaboration with SIDA Grant Coordination has opened a call for research proposal to AAU women researchers for possible funding. The call was posted at AAU website. Twenty-nine (29) women researchers have applied and the proposal has been reviewed by a panel of experts. The review process is completed and the committee has recommended 20 researchers for funding (list attached). Each proposal is awarded 240,000 / Birr.

Table 24: Title, College and names of female academic winning Sida research grants Academy of (NOTE: AELC is for Ethiopian Languages and Culture, CHS for College of Health Sciences, EiABC for Ethiopian Institute of Architecture, Building Construction and City Development, AAiT for Addis Ababa Institute of Technology, CNCS for College of Natural and Computational Sciences, CBE for College of Business and Economics, CSS for College of Social Sciences, IES for Institute of Ethiopian Studies, IER for Institute of Educational Research and IPSS for Institute of Peace and Security Studies)

No.	Title	Colleges	PI
1	Assessment of Gender Mainstreaming in Addis Ababa University: Challenges and Prospects	AELC	Abeba Amare
2	Re-institutionalization of <i>iddir</i> for social development: the case of Arsi	AELC	Firehiwot Bayu
3	Official Recognition of Ethiopian Sign Language (EthSL) versus Aspiration and Linguistic Human Rights (LHRs) of the Deaf Community in Ethiopia	AELC	Elizabeth Demissie
4	Cervical cancer screening among Addis Ababa University staffs; using Health belief model clued by Trans-theoretical model	CHS	Semarya Berhe
5	Integration of need based child friendly club to improve health and nutritional status of children; a cluster randomized controlled trial in public schools of low-income country	CHS	Afrah Mohammed
6	Governance Approaches for Green Infrastructure Planning and Management in Selected Ethiopian Urban Areas'	EiABC	Bosena Yirga
7	Rethinking Planning & Design Interventions for Urban Public Spaces The Case of Addis Ababa, Ethiopia	EiABC	Tsion Lemma
8	Tracing the evolution of building façades in a dynamic streetscape of Addis Ababa through a continuous re-making of the urban face	EiABC	Addisalem Feleke
9	Development of a Drought-index Based Tool for Water Resources Identification	AAiT	Ethiopia Bisrat
10	Performance evaluation of Kaliti Waste water Treatment Plant	AAiT	Mahlet Melaku
11	Investigation of Cyber Crime on Mobile Banking Service in Ethiopia	CNCS	Lielet Getachew
12	Integration of Citizen Science and mobile kits for affordable and participatory soil monitoring system for smallholder agriculture	CNCS	Amsale Zelalem
13	Land suitability assessment for agricultural crops by using GIS based multi-criteria approach in west Gojam zone, Ethiopia	CNCS	Andsera Adugna
14	Detection of urban expansion and its impacts on ecological services in the peri-urban of Addis Ababa, Ethiopia	CNCS	Meron Tekalign
15	Investigating Barriers Hindering Implementation, Innovation and Adoption of ICT in Addis Ababa Secondary Schools	CBE	Rahel Tollossa

No.	Title	Colleges	PI
16	The Socio-Economic Causes and Impacts of HalabaWomen Seeking and Engagement in Causal Work at “Sew Tera” area at HalabaKulito City Administration	CSS	Yania Seid-Mekiye
17	Cooperative and competitive Interaction of Refuges and Host community in Benishangul-Gumuz Region of Ethiopia since 1960s.	IES	Tirsit Sahledingel
18	Assessment of Awareness, Knowledge and Attitude of Environment Pollution among Primary School Children	IES	Almaz Abuhay
19	Bridging Research Knowledge Gap of Undergraduate Students in Ethiopian Higher Education Institutions	IER	Kidist Belete
20	Dynamics of Inter-ethnic conflicts and contemporary Challenges of Peace building in Ethiopia	IPSS	Workinesh Mitiku

8.5. Academic Staff Mobility

Research Director Office planned to support 25 academic staff to participate in international conference for budget year of 2018/2019. However, because of different reasons only 9 academic staffs were traveled for their research work. Since the office had gotten a permission to use the remaining budget, in the first half of 2019/2020 budget year 8 academic staff members were supported to participate in international conference. From 2019/2020 budget one academic staff member got a support to participate in international Conference.

Sida project supports academic staff mobility of Addis Ababa University. The following table shows the name of the researcher, their article and conference place.

Table 25: List of AAU Academic staff, conference theme and conference place

No.	Name	College	Title of conference	Conference Place
1.	Dr. Abeba Beyene	College of Commerce	African Academy of Management	Nigeria
2.	Dr. Belaynesh Tefera	College of Commerce	African Academy of Management	Nigeria
3.	Dr. Getnet Tizazu	College of Education and Behavioral Studies	ISEP Annual Meeting 2019	Spain
4.	Dr. Tilahun Muluneh	College of Commerce	ICIS Conference 2019	Germany
5.	Dr. Dakito Alemu	College of Commerce	Corporate Social Responsibility practices and Stakeholders Awareness	Portugal

AAU-Sida Projects 2019/2020 Technical Report

No.	Name	College	Title of conference	Conference Place
6.	Prof. Tassew Woldehana	College of Business and Economics	Ethiopian Economic Development: A case study	UK
7.	Dr. Girum Ayalneh	College of natural Science	DFT analysis on the effect of Co2 contamination in non-aqueous na-air battery	Spain
9.	Dr. Satishkumar Belliethathan	University industry linkage and Technology transfer	NDC implementation in Ethiopia: Problems and Prospects	Spain
10.	Dr, Badema Belaye	University Press	5 th Istanbul Fellowship Program	Turkey

9. Graduate Program

The major activities of the Graduate Programs Directorate include inviting visiting professors; external examiners and short term international stay for in-house PhD candidates and supporting Female and Special need MA students.

a. Visiting Professors & External Examiners

In this report from July 07, 2019 – December 31, 2019 period, SIDA funds for external examiners have been transferred to student visits because with what was allocated initially we could invite only a very limited number of External Examiners. It is the fact that the Government has given the university the permission to use regular budget to invite external examiners that enabled us to transfer these funds for external examiners to students' visits. Funds for 8 visiting professors will be used for inviting professors possibly for the IT Doctoral program.

b. Short-term International stay for PhD candidates

Addis Ababa University addresses the request of its PhD students who ask for research visit in order to enrich their research by the state of the art laboratories and equipment that are not available in the country and their desire to work closely with their advisors abroad for close supervision and support.

In the implementation of this, GPO has planned to send 25 students in the project period 01 July 2018-30 June 2019 for this purpose. However, due to several reasons, only 18 students were able to travel abroad to use modern laboratories and get close assistance from their advisors until 30 June 2019. Since the director office has got a permission to use the remaining balance, 5 Phd students were travelled from 01 July 2019- 31 December 2019.

The University finances the travel of these PhD students for short-term exposure to universities abroad when their departments or program units recommend such travel as necessary for enriching the research of the PhD students. This sub program was assisted by SIDA and a total of Birr 500,417.97 was utilized for this purpose.

Table 26: List of PhD Students who travelled 01 July 2019- 30 June 30 2020 project period

No.	Names of PhD Students	PhD students' home institute			Hosting country, university, unit, purpose and time		
		College /Institution	Department /School Center	Country	Visited university	Purpose	Duration of stay
1	Mr. Awoke Atinafu Adam	IPSS	Peace and security Studies	New Zealand	University of Otago	Research activity	September 05, 2019 to December 01, 2019
2	Mr. Birhan Aynalem Ayele	Institute of Biotechnology	Institute of Biotechnology	Chile	University of Chile	Research activity	September 20, 2019 to December 21, 2019.
3	Mr. Abay Yimere Semaw	CDS	Center for Environmental and Developmental Studies	USA	University of Massachusetts Boston	Research activity	October 28, 2019 to January 28, 2020
4	Mr. Lopiso Dessalegn Tirore	CHS	Microbiology, immunology and Parasitology	USA	Ohio State University	Research activity	November 01, 2019 to January 31, 2020
5	Mr. Yohannes Tesfaye Endale	EIWR	Water and Health	Belgium	Ghent University	Research activity	December 25, 2019 to March 23, 2020

Table 27: Summary for short-term international stays of PhD students from 07 July 2019 to 30 June 2020

Country	No. of Students
USA	2
Europe	1
S. America	1
Oceania	1

8.3. Female and Special Needs Graduate Students' Scholarship

The number of female students in the graduate program has been very small at AAU. In order to alleviate this problem, AAU has launched the graduate female scholarship scheme supported by SIDA. The scholarship has been fruitful as it has now raised the number of female students in the graduate program from 10 to around 20% of the total graduate student population. The scholarship opportunities target MA or MSc female students and also students with disabilities that have good academic achievements, and as a result who are likely to join the PhD program in the future.

During this budget period out of the total of 853 female students, 50 female and 10 students with disability are scholarship awardees. At present we have 100 female students and 22 students with disability who are the beneficiaries of SIDA funds. The budget allocated and used for this purpose is Birr **1,098,000.00**. The screening and identification of the students with critical need to get financial support are those who can sustain their studies without taking longer time since some of the students had to present their evidences from their home town out of Addis or different regions. Thus, the entire selection was completed and the pace of utilization will be enhanced as of this month. With regard to this sub title, the large number of candidates in the female scholarship schemes was a major problem that needs more attention since the number of applicants is increasing significantly with the increase of the female students in the tertiary education system of the country.

The outbreak of COVID-19 has forced the closure of universities. As a result the activities regarding sending PhD students abroad have been suspended totally. We hope to send them when the

University resumes its tasks when the situation of COVID-19 enables us to resume normal activities. We have also not been able to invite visiting professors as a result of the same situation. On the other hand, we have been able to process the payment of female and disability scholarships until the month of June 2020. Although the money has been transferred to the Finance Office, the scholarship holders could not collect the money owing to the fact that the students are not around.

10. University Industry Linkage and Technology Transfer

a. Introduction

The Office for University-Industry Linkage and Technology Transfer (UILTT), under the Vice President for Research and Technology Transfer, is one of the beneficiaries of AAU-SIDA project funded by the Sweden government. The Office has been substantially benefited by the support from the project in striving to be a solution center for all adaptive, innovative, and consultancy needs of the industry. The office had a plan to accomplish several program activities (14-15) with considerable approved budget/funding from the project. The program activities were designed to strengthen the University-Industry Linkage and to reinforce knowledge and technology transfer by the University. However, due to COVID-19 pandemic and the subsequent State of Emergency in Ethiopia, as well as partly due to high turnover of directors in the Office, almost all of the activities remained unaccomplished as planned in the 2019/20 budget year. Actually, the Office was able to accomplish two program activities: AI conference and production of local face shield in support of the COVID-19 combat.

The Office was successful to fruitfully organize the first international Artificial Intelligence (AI) in Ethiopia Conference held in Addis Ababa from October 28th – 30th, 2019 in Addis Ababa. The conference was fully funded by the AAU-SIDA project. The fund to organize the conference amounts ETB 510,023.00 and it was used to reimburse air ticket and accommodation costs for participants from abroad and outside Addis Ababa (ETB 214,523.49) and the remaining ETB 295,499.51 was utilized to organize and facilitate the conference.

Subsequent to the cancelation of a visiting and experience sharing program of Ethiopian experts to Swedish Universities in the areas of innovation/entrepreneurship, the Office was convinced to modify its original plan and transfer the budget to the production of local face shields and strengthening the research database management of the University. The University successfully produced 5000 local face shields with total cost of ETB 750,000.00 and distributed them to public hospitals fighting COVID-19.

The Office is planning to succeed with the remaining program activities that were not performed in the 2019/20 budget year. Establishing the University-Industry Forum and sustaining the linkages, strengthening the innovation hub centers to cultivate the innovation culture, and

supporting tenants in their startups are priority areas in the 2020/21 budget year. The following table portrays the details.

AAU-Sida Projects 2019/2020 Technical Report

Table 28: Annual Activity and Financial Performance (UILTT)

Responsible Office – UILTT/Activity	Activity / Procurement	Planned outcome	Planned value	Indicator	Budget (SEK)	Budget (ETB) (1 SEK=0.117 Birr)	Performance	Utilized, ETB
Activity No. 1	Workshop preparation to collect data for need assessment.	Number of links created after the workshop that would lead to collaborative efforts	80 people from 80 stakeholders and companies will be invited	Number of workshops held	17,810.00	53,430.00	The need assessment tools are prepared; but the workshop is not conducted partly due to COVID-19	0.00
Activity No. 2	Visiting Ethiopian experts to Swedish Universities for innovation/entrepreneurship related issues	International experience and concrete road map for future action within AAU	Understanding international standards and contextualizing the needs according to Ethiopian condition in the area of Energy, AI/ML/Robotics/ Eng. Design/Entrepreneurship education/pedagogy	Number of visits and road map developed	312,336.00	937,008.00	The visit was canceled due to COVID-19. However, upon the consent of the Sweden Embassy, the budget was transferred to activity 3 and 15	0.00
Activity No. 3	Local face shield production	5000 face shields to be distributed to public hospitals	Support the combat of COVID-19 and protect health workers from the virus	Number of face shields produced and distributed	250,000.00	750,000.00	The face shields were produced and distributed	750,000.00
Activity No. 4	Piloting first online entrepreneurship certificate course in Addis Ababa University	Inaugural online entrepreneurship course run	Capacity to reach out to large number of students and staff members	Number of online certificate courses run	409,000.00	1,227,000.00	This activity is not done; except some part of the website and the EdEX platform are developed.	120,000.00
Activity No. 5	Megenagna meetings	Collaborative links created and ideas generated	Enhanced stakeholder interaction and collaboration	Number of meetings held	78,750.00	236,250.00	Themes for the meetings were defined, but the workshops were not conducted due to COVID-19 State of Emergency	0.00

AAU-Sida Projects 2019/2020 Technical Report

Responsible Office – UILTT/ Activity	Activity / Procurement	Planned outcome	Planned value	Indicator	Budget (SEK)	Budget (ETB) (1 SEK=0.10 Birr 3)	Performance	Utilized, ETB
Activity No. 6	Industry needs assessment	Collaboration between AAU and industries	Enhanced stakeholder interaction and collaboration including internships, joint research program etc.	Number of industries assessed	50,000.00	150,000.00	The need assessment tools are prepared, but the assessment was not conducted	0.00
Activity No. 7.	University infrastructure and investment needs assessment	Infrastructure and investment needs known	Clear understanding of the current needs so as to develop a proper roadmap for future action and innovation excavation	Number of colleges assessed	0.00	-	The university and investment need assessment tools are prepared, but the assessment was not conducted	0.00
Activity No. 8	Annual innovation competition	Annual competition conducted	Innovation culture developed within AAU community	No of entries received No of prizes awarded	93,332.00	279,996.00	The competition was not conducted, but planned to be done in 2020/21 budget year	0.00
Activity No. 9	1st AI in Ethiopia: Annual Conference	Number of conferences conducted	Overcoming current challenges due to infrastructure needs in AI/ML/Robotics	Number of conferences held	196,166.67	588,500.01	The annual conference was conducted successfully	510,023
Activity No. 10	Procurement of materials based on 2019-2020 competition	Developed product	Technology developed	Number of innovative ideas supported associated with the annual competition	180,000.00	540,000.00	Materials for prototype development were purchased and delivered to Dr. Kamil, one of the tenants in the TBIC. Remaining purchase request are under progress	54,843.50
Activity No. 11	Finalization of policy document	UILTT Policy document	Structured interventions in the area of TT and innovation	No of policy document developed	40,000.00	120,000.00	The policy document is prepared for final validation, and the remaining 25% of the job will be completed in the first quarter of the 2020/21 budget year	0.00

AAU-Sida Projects 2019/2020 Technical Report

Responsible Office – UILTT/ Activity	Activity / Procurement	Planned outcome	Planned value	Indicator	Budget (SEK)	Budget (ETB) (1 SEK= Birr 3)	Performance	Utilized, ETB
Activity No. 12	Piloting of the incubated projects from TBIC	Piloting the incubated/graduated projects	Implementation on the ground – benefit to the communities	No of incubated projects	159,000.00	477,000.00	The piloting is under progress and it the priority of the Office in 2020/21 budget year	0.00
Activity No. 13	Piloting job creation project for UG students	Jobs creation trainings	Supporting the students in expenses related to their study	No of jobs created for UG students so	200,000.00	600,000.00	This activity is not yet done for the students were not campuses due to COVID-19	0.00
Activity No. 14	Procurement of materials	Developed product	Technologies developed	No of innovative ideas supported	100,000.00	300,000.00	No materials purchased for this activity	0.00
Activity No. 15	Database/research management tool development	Technologies developed	Improve the research database system of the University	Number of staff usage	62,336.00	187,008.00	It is on under progress.	0.00
Total					1,836,394.6	5,509,184		1,434,866

11. Addis Ababa University Libraries

Table 29:Results based management logical frame work January 2019 /2020 performance

Types of Outputs	Out Comes (Including Targets)	Performance Indicators of Outcomes (If/as established)	Data Source	Data Collection Strategy	Assumptions
Subscribing of e-journals (covered few of Elsevier peer-reviewed International journal)	A potential Access to journals by students, academic staff and researchers	Delivery of users statistics from publishers Annual usage statistics	Publishers, Office of the Procurement, Office of the Budget The Grant coordination office	Online data access from the publisher's database Usage statistics	Improving the quality of research and create a competent PhD Candidate
Purchasing of Heave Duty Scanner Equipment for Support of Graduate Students	Graduate Students, Researchers and Academic staffs of the university a well-organized computer laboratory facility (,Laptop, Desktop computer and Scanning) for their study, group work, discussion and presentation in the library	<ul style="list-style-type: none"> • Purchase Ordering list • Available and implemented facility displayed and documented • User feedback • Users List 	Graduate program office Office of the AVP Office of the Procurement Office of the Budget Library	<ul style="list-style-type: none"> • Users daily usage statistics • Procurement receipt and report • Available equipment 	To create a conducive reading environment Meeting international Expectation to inject quality in to PhD programs
Subscription of Plagiarism Detector Software (Verified internationally Quality Research output)	2000 graduate student and Academic staff will use the software	Usage statistics from the software	<ul style="list-style-type: none"> • Office of the AVP • Office of the Procurement • Office of the Budget and finance • Office of the Grant Coordination office • Suppliers 	<ul style="list-style-type: none"> • Financial report • Sales Agreement • Usage report • Number of verified thesis and dissertation report 	<ul style="list-style-type: none"> • .To improve the quality of research out of the university • To meet international expectations to inject quality into university researcher and PhD student
Training on Plagiarism Software	1200 Researcher and Staff	<ul style="list-style-type: none"> • Registered Participant list • Training schedules 	<ul style="list-style-type: none"> • Office of the AVP • Office of the Grant Coordination office 	<ul style="list-style-type: none"> • Invitation list via email and Letter 	<ul style="list-style-type: none"> • To build the capacity on use of Plagiarism software's

Table 29: Addis Ababa University Libraries Financial Report for the period of 08 July 2019– 30 June 2020

Activity	Allocated Budget, SEK	Performance	Balance	Remarks
Subscription of Plagiarism detector software license fee	519372.00	295,920.96	223,451.04	This budget is transferred from 2018/19 budget year
Configuration and Implementation fee	85,372.00	0	85,372.00	Activity is done by the Library Academic Staff and the budget is transferred for Heave duty scanner purchase
Training for Trainers	85,424.00	0	85,424.00	Activity is done by the Library Academic Staff and the budget is transferred for Heave duty scanner purchase
Training staff	62,660.00	62,660.00	62,660.00	Activity is done by the Library Academic Staff and the budget is transferred for Heave duty scanner purchase
Purchase of Library facility for Graduate students:				
Laptops and Desktop Computers	480600.00	144,076.30	336,524.70	This activity is planned to be done by the 2018/19. However, due to long procurement process, it is finalized by 2019/20 budget year.
Heavy Duty Scanner	420,000	420,000	0	This activity is planned to be done by the 2018/19. However, due to long procurement process, it is finalized by 2019/20 budget year. The payment process is submitted to the SPCO office before the budget year ends
Subscription of competitive e-journals	524080.58	524080.58	0	This money is transferred from 2018/19 budget year
	1,000,000	1,000,000	0	

12. Projects without activities in the year of 2019/2020 budget year

Two sub-projects under the Training and Research Capacity Building Project did not use any funding allocated to them during this budget period of 2019/2020. These are:

11.1. AAU-ICT

AAU-ICT has not used any funding allocated to it in budget years of 2018/2019 and 2019/2020. There were many excuses such as in 2018/2019 the funding is not enough for the kind of activity the office requires. With discussions made in the presence of Dr. Alexander Sellerholm in May 2019 at the APM Meeting, AAU-ICT was allowed to merge funds of 2018/2019 and 2019/2020 into one and start working by July 2019, the beginning of 2019/2020 budget year. Without activation of any of the agreed upon actions, COVID-19 came in February 2020 into Ethiopia and the whole issue of AAU-ICT activities died down.

Besides lack of initiating project activities, AAU-ICT did not either submit technical reports (probably because nothing has been done) or activity plans of each year as other beneficiary AAU units do.

11.2. Office of the Vice President for Administration and Student Service (VPASS)

The VPASS did not have any funding in 2018/2019. According to the AAU-Sida five-year agreement, funding of the VPASS started in 2019/2020. Starting July 2019, this unit of AAU was trying to connect with Swedish universities to conduct experience sharing by way of benchmarking them in financial, business and student management activities. This initiative went some distance with many interruptions in the middle which required booking of visit days with Swedish hosts. As it was very difficult to find so easily with our Swedish partners, there were many delays. Eventually, the COVID-19 situation closed all these activities.

Now, with possible extension of using 2019/2020 funding into 2020/2021 budget year and due to the gaps created by the corona virus epidemics, these units are expected to act quickly to use their funds and come up with the expected outcomes that will qualitatively change their units and generally that of AAU's.

Conclusions

The 2019/2020 project year started with a lot of optimism and hope. It progressed well as it is also a landmark year in which AAU, Sida and the Embassy of Sweden had planned to celebrate the 40th anniversary of AAU-Sida collaborations in research and capacity building. A special taskforce was established from AAU and the Embassy, with a senior Swedish consultant overseeing the whole operations. There have been meetings, document collections and many rebounding activities were made to re-capture the 40-year legacies of the two institutions to the Ethiopian and Swedish people. This continued with the routine project operations of AAU supported by Sida, as depicted in the above about 150 pages of this technical and the separate complementary auditable reports.

All went well until the corona virus pandemic struck the world, and very badly so the poor and weak developing countries like Ethiopia. The pandemic and the ensuing lockdowns in Ethiopia and around the world negatively affected all operations of the AAU-Sida projects and the planned 40th anniversary of the AAU-Sida collaborations. Sida/Stockholm also released an official letter to all partner countries, seven of them in Africa, that major research activities should be suspended as meaningful research cannot be conducted while all the universities involved and their facilities fall under the lockdown.

The current situation on the ground therefore calls for a concerted effort of all actors in the AAU-Sida projects to combat COVID-19; while still working to achieve all the set goals of the AAU-Sida projects as planned. The SPCO, the Embassy of Sweden in Addis Ababa and the AAU management will do all their best to support PIs, students and all academic staff of both countries to achieve their goals and ambitions.

Supplement to the 2019-2020 AAU-Sida Projects Technical Report

(Note: This section of the report had it not come late into the SPCO; it would have made part of the general report. The SPCO regrets the inconveniences.)

Office of University Industry Linkage (UILTT)

The following report is based on the special and the first of its kind conference held at the Addis Ababa Institute of Technology (AAiT), AAU, Addis Ababa, Ethiopia, as organized by the University-Industry Linkage and Technology Transfer (UILTT) Directorate of the Office of the Vice President for Research and Technology Transfer Office, AAU, held from 28 to 30 October 2019. This conference was jointly sponsored by AAU-Sida, the Ministry of Science and Higher Education of the Federal Government of Ethiopia and Wolaita Sodo University, Wolaita, Ethiopia.



An image from the opening ceremony: Far right: Dr. Esayas Gebreyouhanis, Director of Addis Ababa Institute of Technology (AAiT), AAU, Professor Tassew Woldehanna, President of AAU and Guest of Honor and two of the organizer of the conference.

As this is special, it is treated with special contents supported with images of the events of the conference.

Contents

Introduction

Process of Registration

 Pre-Competition and Registration

 Teams Selection and Registration

 Post-Selection and Orientation

Top Five Selection Process

Project Pitching Day

Winners of the Competition

Next Step

Summary

Links

Introduction

Ethiopia is one of the countries severely affected by the impacts of climate change. The country has taken a number of initiatives both at the national and international levels. Currently, Ethiopia is implementing the Climate Resilient Green Economy Strategy (CRGE) so as to mitigate the emissions and adapt to the changing climate. Technology plays a great part in combating climate change. Cognizant of this, *University-Industry Linkage and Technology Transfer Office of AAU* (which also hosts the Incubation Center - Megenagna) together with *Google Developers Group Addis* (GDG Addis) is hosting an **Artificial Intelligence competition** for addressing **Climate Change issues** in the country.

The competition was part of the three days event, first ever AI Conference in Ethiopia between the periods of **28 and 30 of October, 2019**.

This program targets young Ethiopian IT students, software developers and IT enthusiasts and its goal are to let passionate, talented, creative and diverse youth Ethiopian come together and create the opportunity to them to form a team build apps or technologies that will really help to solve climate issues.

University Industry Linkage and Technology Transfer Office, Addis Ababa University partnered with Google Developers Group as of being the implementers of this project from both the technical and organizational side.

Process of Registration

Pre-Competition and Registration

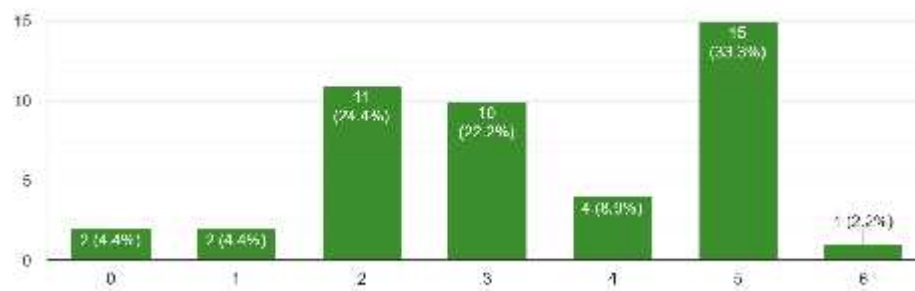
We had teams registered using the registration form on Google Form. Prior announcements of the registration were made on the first of August 2019. One obligation set was that at least one individual member should be a student in AAU.

We received responses from **12** different university institutions, who were enrolled in **7** different field of studies.

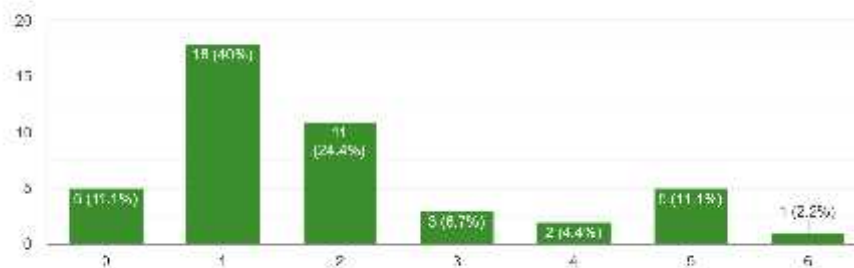
The form was promoted using the official website and all social media channels, from the GDG Addis team and also the UILTT office, under the **#AICC2019**

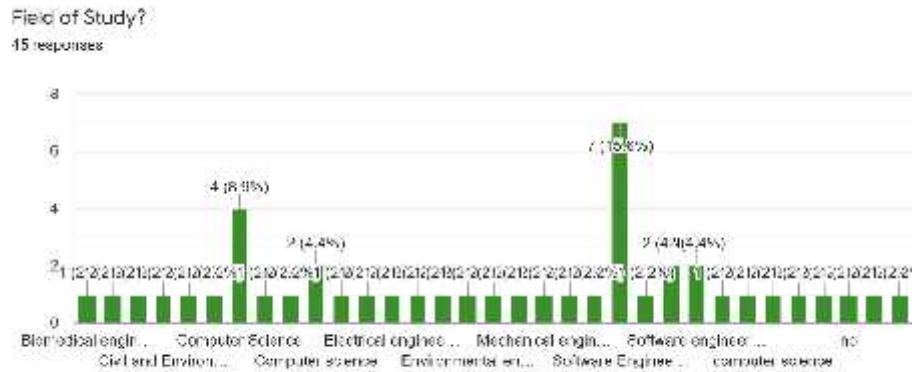
A total of **45** responses of team leaders formed a team. More statistics are below:

How many members?
45 responses



How Many Members are from AAU?
45 responses





Teams Selection and Registration

On August 23, and out of **225** participants, **78** participants of **17** selected teams were contacted via phone and email to confirm their participation.

Additionally, it was announced that we are no longer accepting teams registering.

Post-Selection and Orientation

Selected teams were asked to come for an orientation session at 5kilo, Pharma Compound, where the GDG Addis team would help them know their technical preferences and work elevating their expertise.



Also, Teams were asked to submit abstractions and pilot versions of their projects by September 18 in order to evaluate the top 5 teams for the AI Conference Pitching Session.

The GDG Addis team pondered the teams ideas and suggestions and what type of systems are they willing to develop, besides an area of interest within the Climate Change recent movements.

Top Five Selection Process

On September 19, the collection of the abstractions ended with 18 abstractions from the **17** teams regarding different areas. They were contacted back with the judging criteria that were vital to fulfill in order to be qualified to the next phase.

On October 16, all the teams have been asked to come again to 5 kilo, Pharma Compound, where teams will be presenting their abstractions alongside a demo of the destined project to expert judges, which ended up with choosing the top five teams to pitch at the AI Conference on October 30, the third and last day of the event.

Project Pitching Day

Top five teams prepared slides and demos to present to a panel of experts and the attended audience. The experts were:

- Dr. John AdedapoOjo, from Nigeria
- Dr. AhunNeguyen, from UK
- AurelleLcuagna, from Cameroon
- Dr. AhmadouAballake, from Cote d'ivoire



The session started with an overview from Daniel Nigusse, co-organizer of GDG Addis, in which he gave a quick overview about the competition.



Teams were given 10 minutes each, where it was split to 7 minutes for the slides and 3 for questions and answers from the judges and the audience.

Prior the session, all the team members been gathered from a small orientation about how to use the time given perfectly and how to be on point while presenting the solutions they developed.



Winners of the Competition

At the end of pitching session, came the part where the top three teams are to be announced by the panel of experts.



Top three teams were selected based on:

Feasibility	How can this project be implemented in the short and long run
Functional Requirements	Does the system has basic functionalities where the user can interact
Applied Methodology	How the proposed system is built and the methodology they have followed
Applied Technology	The technology they have applied and range of technology usage
Localization & Usability	How the system is built in consideration of local user and people with disability
Team Work	How much the team collaborated throughout the stay.

The 1st team gained a percentile of 95.5%, 2nd team with 84%, and 3rd team with 79%.

AI for Climate Change Competition Winners received

- 15,000 birr for the 1st team
- 12,000 birr for the 2nd team and
- 8,000 birr for the 3rd team
- A Masters scholarship to Wolaita Sodo University

Next Step

Teams will be contacted with potential stakeholders so as to continue their projects. Also, they will have the priority to gain access to the upcoming, newly installed GPUs to train their data and models. Finally, they will have chance to get an incubation center opportunity.

Summary

This program was really great opportunity for young software developers and students to show their skill, to use their potential and demonstrate their talent. This program allowed participants to learn from peers, to experience team work, project management and time management. This program has promoted diversity and inclusion by creating opportunity for an environment where innovators will be able to solve real world problems that matters all people. The continued effort and interest of the community in supporting the implementation of pilot projects is the best guarantee that UILT, AAU, and other stakeholders and we as the organizer will achieve a real impact at the local level. The shape and procedure of community involvement will vary depending on the type of stakeholders that takes the lead in the post-hack development.

In summary, it was really inspiring and great experience.

Links

Registration Link Form: <http://tiny.cc/FormRegistration>

Official Website: <http://iltt.aau.edu.et/>

AI For Climate Change: http://iltt.aau.edu.et/?page_id=1009

GDGAddis Website: <https://gdgaddis.com/>

Judging Criteria: <http://tiny.cc/JudgeCriteria>

Abstractions: <http://tiny.cc/AllAbstractions>

Top Five Abstractions: <http://tiny.cc/TopFiveSubmissions>

Some more images reflecting the conference activities and participants.



Annexes

AAU-Sida Managements & Economics PhD Program

Profiles of the academic exercises in 2019/2020 Year II Project Period



Left: Mrs. Selamawit G. Kebede, a PHD candidate in Economics defending her Dissertation entitled: ***“Essays on the Path to Industrialization in Ethiopia”*** on May 22, 2020 at the College of Business and Economics (CBE), AAU. **Right:** Dr. Zerayehu Semie, Chair of the Department Economics moderating the defense process.



Left: Mr. Yonathan Dessalegn, a PHD candidate in Economics defending his dissertation entitled: ***“Off-farm Activities, Incomes and Household Welfare in Rural Ethiopia”*** held on June 15, 2020 at CBE, AAU. **Right:** Dr. Alemu Mekonnen, Dean College of Business and Economics and Internal Examiner.



Tsegaye Mulugeta, a PHD candidate in Economics defending his dissertation entitled: “Impacts of Improved Agricultural Technologies Adoption on Multidimensional Welfare Indicators in Rural Ethiopia” held on June 16, 2020 at CBE, AAU. Dr. Wasie Berhanu served as the internal examiner.





Mr. Kokeb GebreGiorgis, a PhD candidate in Economics defending his dissertation entitled: ***“Welfare Implications of Migration, Remittance, and Governance”*** on June 22, 2020 at CBE, AAU. **Right:** Assefa Admassie, Co-Advisor, Dr. Bamlaku Alamrew Internal Examiner and Dr. Zerayehu Simie Chairperson Department of Economics.



Left: Mr. Tsegaye Kaleab, a PHD candidate defending his dissertation entitled: ***“Essays on Efficiency and Growth of Ethiopian Air Transport Industry”*** held on June 22, 2020 at CBE, AAU.



Mr. Marshal Nigussie, a PhD candidate in Economics defending his dissertation entitled: ***“Essays on Roads, Poverty, and Subjective Well-Being in Ethiopia”*** held on June 25, 2020 at CBE, AAU



Left: Mr. Jonse Bane, a PHD candidate defending his dissertation entitled: ***“The Role of Livestock in Poverty Reduction among Ethiopian Household”*** on June 25, 2020 at CBE, AAU. **Right:** Dr. Wasie Berhanu Internal Examiner, Dr. Alemu Mekonnen, Dean of the College of Business and Economics and Co-advisor and Dr. Dr. Zerayehu Simie, Chair of the Department of Economics



Background information on PhD students and the supervision team (July 2020 to June 2021 Economics and Management Departments)

Department of Economics: PhD Program

Batch	No.	Name of the student	Admission (Year, Semester I)	Main supervisor	Co supervisor	Year of dissertation defense	Remark
3 rd batch	1	Fentahun Beylie	2012/13	Prof. Scott Hacker	Dr. Girma Estiphanos	2019, with extension of 2 years	Successfully defended in Oct and Dec 2019
	2	Getu Tigre	2012/13	Prof. Almas Heshmati	Dr. Wassie Berhanu		
4 th batch	1	Marshal Negussie	2013/14	Prof. Kristofer Månsson	Dr. Worku Gebeyehu	2020, with extension of two years	They aill successfully defend till June 30, 2020 (Except Martha and Gutu)
	2	Martha Kibru	2013/14	Prof. Johan Klaesson	Dr. Tekie Alemu		
	3	KokebG.Giorgis	2013/14	Prof. Pär Sjölander	Dr. Assefa Admassie		
	4	Tsegay Kaleab	2013/14	Prof. Börje Johansson	Prof. Tassew Woldehanna		
5 th batch	5	Guta Legesse	2015/16	Prof. Almas Heshmati	Dr. Worku Gebeyehu	2020 with a regular move and 2022 with exaction of two years	
	6	Gutu Gutema	2015/16	Prof. Pär Sjölander	Dr. Wassie Berhanu		
	7	Jonse Bane	2015/16	Prof. Pär Sjölander	Dr. Alemu Mekonnen		
	8	Selamawit G/Egziabher	2015/16	Prof. Almas Heshmati	Dr. Atlaw Alemu		
	9	TsegayeMulugeta	2015/16	Prof. Almas Heshmati	Dr. Kefyalew Endale		
	10	Yonatan Desalegn	2015/16	Prof. Almas Heshmati	Dr. Adane Tuffa		
6 th batch	11	Meseret Birhane Abebe	2016/17	Prof. Yonas Alem, UG	Dr. Kefeyalewu Endale	2021 with a regular move, and 2023 with two extension of two years	
	12	Mezid Nasir Keraga	2016/17	Prof. Andreas Stephan	Dr. Messele W.		
	13	Moges Tufa Adinew	2016/17	Prof. Måns Söderbom, UG	Dr. Zerayehu Sime		
	14	Gidisa Lachisa Tato	2016/17	Prof. Yonas Alem, UG	Dr. Assefa Admassie		
	15	NuredinJuhar	2016/17	Prof. Gunnar Köhlin, UG	Dr. Alemu Mekonnen		
	16	Desalegn Dawit Chamma	2016/17	Prof. Paul Nystedt	Dr. Tewodros Negash		

AAU-Sida Projects 2019/2020 Technical Report

Batch	No.	Name of the student	Admission (Year, Semester I)	Main supervisor	Co supervisor	Year of dissertation defense	Remark
	17	Hailegebriel Yirdaw	2016/17	Prof. Måns Söderbom, UG	Dr. Tadele Ferede		
	18	Gemeda Olani Akuma	2016/17		Dr. Fantu Guta		
	19	Kebed Bekele Geleto	2019/20				
	20	Eyayu Tesfaye Mulugeta	2019/21				
	21	Hailu Adugna Ayano	2019/22				
	22	Mohammed Beshir Mohammed	2019/23			Admitted with such sandwich program of JIBS and UG	
	23	Ermias Ganamo Gazuma	2019/24				They are on Course Work
7th batch	24	Leulseged Lemma Woldemichael	2019/25				
	25	Abrham Seyoum Gonfa	2019/26				
	26	Dereje Yohannes Zegeye	2019/27				
	27	Gebre Kiristos Gebre Selassie Gebre Kidan	2019/28			Admitted without such sandwich program	
	28	Mebratu Negera Feisa	2019/29				

NB: red color shows the students who defended their thesis till June 30, 2020

AAU-Sida Projects 2019/2020 Technical Report

Department of MGMT: PhD Program

Batch	No.	Name of the student	Admission (Year, Semester I)	Main supervisor	Co supervisor	Year of dissertation defense	Remark
1st batch	1	Hussein Yimam	2013/14	Prof. Ethel Brundin	Dr. Mohammed Seid	2019/20, with extension of 2 years and one year withdrawal to stay per to AAU regulation	1 PhD student defended in June 2020 (red color). 6 filled withdrawal and will be readmitted in September 2020
	2	Demeke Chimdessa Gutu	2013/14	Prof. Lucia Naldi	Dr. Yitbarek Takele		
2nd batch	3	ErmiasWerkilul	2014/15	Dr. Thomas Muller	Dr. Yitbarek Takele	2019/20, with two years extensions.	
	4	GetnetAlemu	2014/15	Dr. Karin Hellersted	Dr. Zewdie Shibire		
	5	Hailemiekael Deres	2014/15	Dr. Thomas Muller	Dr. Yitbarek Takele		
	6	Jebessa Teshome	2014/15	Dr. Karin Hellersted	Dr. Mohammed Seid		
	7	Yaschilal Shitaye	2014/15	Dr. Karin Hellersted	Dr. Zewdie Shibire		
3rd batch	8	Fyery Adhena Abreha	2015/16	Prof. Ethel Brundin	Dr. Jemal Mohammed	2021 with extension of two years	
	9	Meba Tadesse	2015/16	Prof. Lucia Naldi	Dr. Ethiopia Legesse		
	10	Toli Jembere	2015/16	Prof. Benson Honig	Dr. WorknehKassa		
	11	Yoseph Tilahun	2015/16	Prof. Lucia Naldi	Dr. WorknehKassa		
	12	Zemenu Aynadis	2015/16	Prof. Ethel Brundin	Dr. Tilahun Teklu		
4 th batch	13	Anduaem Debas Awoke	2017/18	Prof. Ethel Brundin	Dr. Yitbarek T.	2021 with a regular move, and 2023 with two extension of two years	
	14	Damena Abebe Gameda	2017/18	Dr. Norbert Steigenberger	Dr. Lakew Alemu		

AAU-Sida Projects 2019/2020 Technical Report

	15	Gemechis Terfa Eticha	2017/18	Dr. Olof Brunninge	Dr. WorknehKassa	
	16	Yilma Geletu Wolde Yohanis	2017/18	Dr. Adele Berndt	Dr. Yohannes W.	
5th batch	17	Demeke Afework Tessema	2018/19	assignment pending comprehensive exam	assignment pending comprehensive exam	2022 with a regular move, and 2023 with one year extension
	18	Tigist Tesfaye Abebe	2018/19	assignment pending comprehensive exam	assignment pending comprehensive exam	
	19	Zerihun Abera Gudissa	2018/19	assignment pending comprehensive exam	assignment pending comprehensive exam	
	20	Zerihun Girma Aragaw	2018/19	assignment pending comprehensive exam	assignment pending comprehensive exam	

N.B: 1. For Economics department 11 co-supervisors are expected to visit Sweden for 16 supervision meeting. However, 13 meeting is presumed due to 3 co-supervisors (in green color) for 3 meeting

2. For Management department 8 co-supervisors were expected to visit Sweden for 14 supervision meeting in spring 2020. However, 14 meeting are suspended due to 3 co-supervisors

Department of management

No.	Co-Supervisors	Load	No.	Main supervisors	Load
1	Dr. Assefa Admassie	1	1	Almas Heshmati	5
2	Dr. Tadele Ferede	1	2	Andreas Stephan	1
3	Dr. Adane Tuffa	1	3	Börje Johansson	1
4	Dr. Alemu Mekonnen	2	4	Gunnar Köhlin, UG	1
5	Dr. Assefa Admassie	1	5	Johan Klaesson	1
6	Dr. Atlaw Alemu	1	6	Kristofer Månsson	1
7	Dr. Fantu Guta	1	7	Måns Söderbom, UG	1
8	Dr. Girma Estiphanos	1	8	Pär Sjölander	3
9	Dr. Kefeyalewu Endale	2	9	???	2
10	Dr. Messele W.	1	10	Prof. Paul Nystedt	1
11	Dr. Tekie Alemu	1	11	Scott Hacker	1
12	Dr. Tewodros Negash	1	12	Yonas Alem, UG	2
13	Dr. Wassie Berhanu	2		TOTAL	20
14	Dr. Worku Gebeyehu	2			
15	Dr. Zerayehu Sime	1			
16	Prof. Tassew Woldehanna	1			
	TOTAL	20			

N.B: 16 co-supervisors are expected to visit Sweden for supervision meeting

AAU-Sida Projects 2019/2020 Technical Report

No.	Co-Supervisors	Load	No.	Main supervisors	Load
1	Mohammed Seid	2	1	Ethel Brundin	4
2	YitbarekTakele	4	2	Lucia Naldi	3
3	ZewdieShibire	2	3	Thomas Muller	2
4	Jemal Mohammed	1	4	Karin Hellersted	3
5	Ethiopia Legesse	1	5	Benson Honig	1
6	WorknehKassa	3	6	OlofBrunninge	1
7	TilahunTeklu	1	7	Norbert Steigenberger	1
8	YohannesWorkaferahu	1	8	Adele Berndt	1
9	LakewAlemu	1			
10	to be assigned for batch 5	1			
11	to be assigned for batch 5	1			
12	to be assigned for batch 5	1			
13	to be assigned for batch 5	1			

International and Comparative Education PhD Program



Left: Dr. Muluken Nigatu, Dr. Alebachew Kemisso, from CCEPS, middle, and Dr. Shelby Carvalho from Harvard University to the left presentation in International Conference at Ghion Hotel, May 2019

Professor Thomas Popkewitz from the University of Wisconsin Madison and presentation by Mrs. Yeshihareg Damte from CCEPS at International Conference at Ghion Hotel, May 2019



Professor Thomas Popkewitz from University of Wisconsin Madison to the left Dr. Alebachew Kemisso from CCEPS in the middle and Dr. Yekoyealem Dessie to the right after Professor Popkewitz public Lecture in AAU Sidist kilo, May 2019.

CCEPS staff and students at Fikka (Coffee) after seminar in Gothenburg University in December 2019

Research Directorate Director Office



Benchmarking visit of the Office of the Vice President for Research and Technology Transfer of Addis Ababa University to Gothenburg University, Sweden



Part of the supervision training organized by the Research Directorate of Addis Ababa University and conducted by Gothenburg University, Sweden, in Bishoftu, Ethiopia