

Call for PhD applicants – To MSc/MA holders of Bahir Dar University

The BDU-IUC Project Phase II would like to select one high-potential academic staff of BDU, for each of the following 15 PhD positions.

Note: Please refer here below application requirements, document submission and selection Procedures.

Position 1: Tree structure (measured from LiDAR surveys) and impact on ecosystems services (microclimate, carbon stocks) for church forests in the Lake Tana Basin

Place of study: Belgium, Ghent University

The PhD research

- LiDAR surveys will be utilized to conduct a thorough investigation of the tree structure in the church forests of the Lake Tana Basin. This investigation aims to establish a connection between the ecosystem services of the church forests - which are currently not well understood - and their tree structure. The ecosystem services in question include the church forest microclimate and the storage of carbon both above and below ground. It is advised that candidates possess technical skills, has some experience with programming (R or Python) and expertise in the field of ecology, as well as a readiness to carry out fieldwork in remote areas.
- Will contribute to the BDU-IUC Subproject Climate-resilience of terrestrial environments
- Four year sandwich research programme, 24 months in Belgium, 24 months at Bahir Dar University
- Main promoter in Belgium: Prof. Kim Calders (kim.calders@ugent.be)
- Main promoters in Ethiopia: Dr. Alemayehu Wassie (alewas2008@yahoo.com)

Position 2: Process-based understanding of the impact of rainfall characteristics on gully erosion

Place of study: Belgium, Ghent University

The PhD research

- PhD topic: To investigate the correlation between rainfall characteristics and gully erosion dynamics in the Gumara Catchment, the study requires measurements of both using a pluvio-disdrometer and LiDAR scanning and time-lapse photography at approximately three specific locations. It is recommended that individuals possess technical competencies and expertise in geomorphology and hydrology, as well as a willingness to conduct fieldwork at remote sites.
- Will contribute to the BDU-IUC subproject Climate-resilience of terrestrial environments
- Four year sandwich research programme, 24 months in Belgium, 24 months at Bahir Dar University
- Main promoter in Belgium: Prof. AmauryFrankl (Amaury.frankl@ugent.be)
- Main promoters in Ethiopia: Prof EnyewAdgo (enyewadgo@gmail.com)

Position 3: River sediment fluxes (as recorded by remote sensing) and the Impact of geomorphology and catchment management strategies

Place of study: Belgium, KU Leuven

The PhD research

- PhD topic: The study aims to establish a correlation between sediment fluxes in the Lake Tana Basin and river turbidity data derived from satellite images. Through this correlation, a deeper comprehension of sediment fluxes and the factors controlling sediment delivery at large spatial scales will be achieved. The research calls for individuals with expertise in geomorphology, hydrology, and remote sensing, as well as modelling skills.
- Will contribute to the BDU-IUC subproject Climate-resilience of terrestrial environments
- Four year sandwich research programme, 24 months in Belgium, 24 months at Bahir Dar University
- Main promoter in Belgium: Prof. Gert Verstraeten (gert.verstraeten@kuleuven.be)
- Main promoters in Ethiopia: Dr. Hanibal Lemma (haniballemma@gmail.com)

Position 4: Developing water allocation tools and strategies for an integrated and sustainable surface and groundwater management in the Lake Tana basin

Place of study: Belgium, Ghent University

The PhD research

- To assess the current water management practices, quantify the existing demands and supplies, develop water allocation tools and strategies for an integrated and sustainable surface and groundwater management in the Lake Tana basin. It is recommended that individuals possess technical competencies and expertise in hydrology, modelling, programming skills and willingness to conduct fieldwork at remote sites.
- Will contribute to the BDU-IUC Subproject 3 named as “Water”
- Four-year sandwich research programme, 24 months in Belgium, 24 months at Bahir Dar University
- Promoters in Belgium: Prof. dr. ir. Niko Verhoest - Ghent University (Niko.Verhoest@UGent.be) and Prof. dr. ir. Ann Van Griensven - Vrije Universiteit Brussel
- Promoters in Ethiopia: Dr. Mekete Dessie (dessie95@gmail.com) and Dr. Mulugeta Azeze from Bahir Dar University

Position 5: Impact of dams, climate change, and groundwater exploitation on the hydro-system in Lake Tana basin

Place of study: Belgium, Ghent University

The PhD research

- PhD topic: To investigate impact of dams, well fields (e.g., Kola Diba wells for Gondar town water supply) and climate change on the groundwater and Lake Tana & its surrounding hydro-system. It is recommended that individuals possess technical competencies and expertise in hydrogeology, hydrology, remote sensing and willingness to conduct fieldwork at remote sites.
- Will contribute to the BDU-IUC Subproject 3 named as “Water”
- Four-year sandwich research programme, 24 months in Belgium, 24 months at Bahir Dar University
- Promoters in Belgium: Prof. dr. Kristine Walraevens (Kristine.Walraevens@UGent.be) and Prof. dr. Thomas Hermans from Ghent University
- Promoters in Ethiopia: Dr. Mekete Dessie (dessie95@gmail.com), Dr. Fenta Nigate and Dr. Alemu Yenehun from Bahir Dar University

Position 6: Cost-effective irrigation methods and water management at farm/field level

Place of study: Belgium, Ghent University

The PhD research

- PhD topic: To study the existing water management and irrigation methods at field level, agronomic practices and identify cost-effective irrigation methods and water management at farm/field level. It is recommended that individuals possess technical competencies and expertise in irrigation engineering, agronomy/soil science and willingness to conduct fieldwork.
- Will contribute to the BDU-IUC Subproject 3 named as “Water”
- Four-year sandwich research programme, 24 months in Belgium, 24 months at Bahir Dar University
- Promoters in Belgium: Prof. dr. ir. Wim Cornelis - Ghent University (Wim.Cornelis@UGent.be), Prof. dr. ir. Margaret Chen - Vrije Universiteit Brussel
- Promoters in Ethiopia: Dr.SeifuAdmasu (satadm86@gmail.com), Dr.DesaleKidane, Dr.AbebechAbera from Bahir Dar University

Position 7: Technologies for heat and drought tolerance of tomatoes

Place of study: Belgium, KU Leuven

The PhD research:

- In the field, crops often encounter a combination of abiotic stresses that severely limit yields. Seed priming with plant hormones or NaCl is a promising and cost-effective method to increase tolerance of crops to the abiotic stress like heat and drought including tomatoes. The candidate will assess the efficacy of different seed priming approaches in alleviating the negative effects of abiotic stress (drought and heat) on tomato growth and development. He/she will test the hypothesis that primed seeds mount a molecular stress response that enables the plant to withstand abiotic stresses during the later stages of development and enhance yield. The project will combine a diversity of methods, including whole-plant physiology and molecular biology. It is recommended that the individual possess the knowledge of plant physiology and molecular biology.
- Will contribute to the BDU-IUC subproject Food production and postharvest technology
- Four-year sandwich research programme, 24 months in Belgium, 24 months at Bahir Dar University
- Main promoter in Belgium: Prof. Joelle Muhlemann (joelle.muhlemann@kuleuven.be)
- Main promoter in Ethiopia: Dr.MelkamuAlemayehu (melkalem65@gmail.com)

Position 8: Management of white mango scale

Place of study: Belgium, Ghent University

The PhD research:

- The project is an effort to develop an integrated pest management system that combines less environmentally disruptive pesticides (biorationals), cultural and biological control methods against white mango scale in Amhara and Benishangul-Gumuz regions of Ethiopia. The candidate will determine the relationship between white mango scale infestation level and environmental factors (weather factors, seasonal influence, soil fertility status, etc.) and agronomic practices (mango varieties, irrigation, fertilization, and weed management). The candidate will test the hypotheses that native predators and parasitoids exist in Ethiopia and can be used to control white mango scale in the study area. Therefore, the student will consider the use of native parasitoids and/or predators for pest control. At the same time, the candidate will evaluate the potential of introduction of non-native control agents (depending on the current national policy) and the experimental use of biorationals (i.e., environmentally friendly pesticides for the control of the pest and hence, the development of IPM strategies. Finally, the student will determine the origin of the white mango scale populations found in Ethiopia through molecular methods, thus laying the foundation for its correct management.
- Will contribute to the BDU-IUC Subproject 4, Food Production and Postharvest Technology

- Four-year sandwich research programme, 24 months in Belgium, 24 months at Bahir Dar University
- Main promoters in Belgium: Prof. Eduardo de la Pena (Eduardo.DeLaPena@ugent.be) and Prof. Patrick De Clercq (patrick.declercq@ugent.be)
- Main promoter in Ethiopia: Dr.Melaku Wale (melakuwale68@gmail.com)

Position 9: Sustainable postharvest loss reduction technologies for potato

Place of study: Belgium, KU Leuven

The PhD research

- The PhD topic: The significant postharvest losses of potato and the associated economic losses in Ethiopia are highly linked to the lack of knowledge and proper postharvest handling systems. The main objective of this PhD research is to develop sustainable postharvest technologies to prolong the storage life of potato. First, the individual will collect baseline data on potato varieties, growing and harvesting methods and postharvest handling practices. The student will investigate the respiration, transpiration, sprouting and microbial decay characteristics under controlled storage conditions (Temperature and RH). The individual will then develop multiscale reaction-transport models of the postharvest handling processes and solve them numerically. Finally, the student is expected to develop and test optimal sustainable packaging and storage systems for local potato varieties. The student should have basic knowledge of transport phenomena (heat, mass and momentum transfer) and chemical kinetics.
- Will contribute to the BDU-IUC subproject 'Food production and postharvest technology'
- Four-year sandwich research programme, 24 months in Belgium, 24 months at Bahir Dar University
- Main promoters in Belgium: Prof. Bart Nicolai (bart.nicolai@kuleuven.be);
- Main promoter in Ethiopia: Dr.Mulugeta Admasu (muluadmasdel@gmail.com)

Position 10: Community structure, ecology and productivity of planktonic biota in Lake Tana

Place of study: Belgium, Gent University

The PhD research

- PhD topic:
 - Study the effect of seasonal changes in environmental conditions on the biodiversity and structure of planktonic communities based on high-throughput sequencing of environmental DNA from selected sites in Lake Tana.
 - Assess the mutual effects of changes in nutrient concentrations and turbidity on the productivity and community structure of phytoplankton and zooplankton based on mesocosm experiments.
- Will contribute to the BDU-IUC Subproject Aquatic Ecology
- Four year sandwich research programme, 24 months in Belgium, 24 months at Bahir Dar University
- Promoters in Belgium: Prof. Elie Verleyen (elie.verleyen@ugent.be), Prof. Bram Vanschoenwinkel
- Promoter in Ethiopia: Prof. Mulugeta Kibret (mulugetanig@gmail.com.)

Position 11: Ecology and population genetic structure of *Labeobarbus* fish species in Lake Tana

Place of study: Belgium, Hasselt University

The PhD research

- PhD topics;
 - Study the ecology and population genetic structure of *Labeobarbus* species in Lake Tana
 - Assess the stocks of commercially important fish species and compare with previous assessments
- Will contribute to the BDU-IUC Subproject Aquatic Ecology
- Four-year sandwich research programme, 24 months in Belgium, 24 months at Bahir Dar University
- Promoters in Belgium: Prof. Alain De Vocht (alain.devocht@uhasselt.be)
- Promoter in Ethiopia: Dr MinwyeletMingist(minwyeming@gmail.com)

Position 12: Spatial and temporal dynamics in endemic and non-native aquatic wetland macrophytes and their interactive effects on aquatic and wetland communities in Lake Tana

Place of study: Belgium, VrijeUniversiteit Brussels (VUB)

The PhD research

- PhD topics:
 - Mapping the spread of water hyacinth and assessing its influence on the turbidity of the lake water and wetland vegetation by using remote sensing technology
 - Conducting a mesocosm experiment to study the interactive effects of projected changes in turbidity and nutrient concentrations and the role of water hyacinth cover on littoral communities
 - Conducting a field experiment to evaluate the effectiveness of *Cyperus papyrus* plantation to control water hyacinth spread
- Will contribute to the BDU-IUC Subproject Aquatic Ecology
- Four year sandwich research programme, 24 months in Belgium, 24 months at Bahir Dar University
- Promoters in Belgium: Prof. Iris Stiers (Iris.Stiers@vub.be), Prof. Bram Vanschoenwinkel, Prof. Wouter Maes
- Promoter in Ethiopia: Dr. Ayalew Wondie (ayalewyelfe2015@gmail.com)

Position 13: Urbanization and food security in Ethiopia

Place of study: Belgium, Ghent University

The PhD research:

- Urbanization is the defining global phenomena of the century and it is becoming one of century's most transformative trends, marked by a relentless increase in the numbers of urban population, an expansion of the built environment, and the changing of norms, cultures and lifestyles. It's therefore not surprising that urbanisation itself brings about considerable sustainability challenges in many key areas including food security. Given that Ethiopia has been experiencing rapid urbanization, it is crucial to understand the nexus between urbanization and food security for better and informed policy and decision making. Existing evidences show that Ethiopia is a country that experiences a rapid urbanization rate. The rapid urbanization results in a number of challenges in relation to housing, land, water, electricity, sanitation and pollution in Ethiopia. However, the issue of food security in relation to urbanization has given little attention in research and policy formulation processes. Most studies on food security in Ethiopia focus on rural areas and they fail to address the issues from the perspectives of urbanization. Hence, there is a dearth of academic research on impacts of urbanization on food security taking into account the unique and peculiar characteristics of urban areas in Ethiopia. Thus, conducting doctoral research with the intention to provide in-depth analysis of the link between urbanization and food security is expected to fill the gap.

- Will contribute to the BDU-IUC Subproject 6: Socioeconomics, sustainable livelihood and environmental management
- Four-year sandwich research programme, 24 months in Belgium, 24 months at Bahir Dar University
- Promoter in Belgium: Prof. Marijke D'Haese (Marijke.DHaese@ugent.be), Ghent University
- Promoter in Ethiopia: Dr. Achamyelash Gashu Adam (agachamyelash@gmail.com), Institute of Land Administration, BDU

Position 14: Tourism governance in Ethiopia

Place of study: KU Leuven, Belgium

The PhD research:

- Tourism governance is the process of regulating tourist destinations through synergistic and coordinated efforts by governments at different levels and capacities; civil society living in the inbound tourism areas; and the business sector involved in the operation of the tourism system's functioning; the voluntary sector. The research on tourism governance will identify bottlenecks affecting coordinated effort of governments, business and civil society working in tourism system's functioning. By integrating collective decision-making and representing diverse interests, tourism governance brings benefits such as efficiency, efficacy, fairness, transparency, accountability, cooperation, and legitimacy. These benefits have been widely discussed and have formed the basis of political, social, and business discourses. Identifying what are seen to be the features of good governance in each network by examining how these constructs are given meaning and determining the consequences for local tourism policy is important.
- Will contribute to the BDU-IUC Sub-project 6: Socioeconomics, sustainable livelihood and environmental management
- Four year sandwich research programme, 24 months in Belgium, 24 months at Bahir Dar University
- Promoter in Belgium: Prof. Jan van der Borg, Division of Geography and Tourism, KU Leuven, Leuven, Belgium.
- Promoters in Ethiopia: Prof. Amare Sewnet (amare1974@gmail.com) - Department of Geography and Environmental Studies, Bahir Dar University

Position 15: Economics of land/ecosystem degradation to support climate change

adaptation options

Place of study: Belgium, University of Antwerp

The PhD research:

- Climate change has a significant impact on sustainable development, as expressed in UN SDG-13, which calls for immediate action to adapt to and reduce the effects of climate change. Sub-Saharan African countries have been struck the hardest by these shifts due to a lack of adaptability. As a consequence of the heavy reliance in Ethiopia on a climate-sensitive agricultural sector that suffers greatly from risks linked with high variability in rainfall, it is frequently cited as very susceptible to climate variability and change. Moreover, the country's geographical location and topography, which cause significant land degradation, along with a low level of adaptation capability among households, increased its vulnerability to the adverse effects of climate change. The majority of smallholder farmers in north western Ethiopia live in rain-fed areas with substantial unpredictability in rainfall, temperature, and extreme events. While the region is suitable for agricultural production, it is susceptible to frequent climatic variability events and the issues associated with it. This highlights the need of understanding current agricultural climate change adaptation options that are being (dis)adopted at different scales in connection to addressing land degradation, future-proofed adaptation options, and farmers' willingness to pay for attributes of such options. Understanding location-specific adaptation strategies, including both present and future-proofed adaptive options, is critical in establishing suitable policy responses depending on each location's susceptibility and

sensitivity level. As a result, a range of analytical studies at the local scale are needed to provide a relevant study of the economic consequences of climate change and the responses to it.

- Will contribute to the BDU-IUC Subproject 6: Socioeconomics, sustainable livelihood and environmental management
- Four year sandwich research programme (24 months in Belgium and 24 months at Bahir Dar University)
- Promoter in Belgium: Prof. Steven Van Passel Steven(VanPassel@uantwerpen.be)- University of Antwerp
- Promoter in Ethiopia: Dr.ZerihunNigussie(zeriye@gmail.com) - BDU

The successful candidate for each of the academic positions should:

- Be a current academic staff member of BDU with an MSc degree
- Have an academic background that is relevant to the proposed PhD topic
- Meet the one of following minimum requirements (a, b, c):
 - a) Hold an international master's degree and have obtained above average results during his/her BSc and MSc studies
 - b) Has published at least one papers in international (SCI) journals, preferably in the field of interest
 - c) Provide proof of English proficiency, such as a TOEFL certificate, indicating excellent written and oral skills in the language
 - Candidates that do not fulfil the minimum requirement for selection should provide a motivated statement to explain their progress
- Be under the age of 40
- In the case of equal qualifications, priority will be given to female candidates

Submission of applications

- Motivation letter (maximum 1 page) and CV (maximum 2 pages; including telephone numbers of 3 reference persons)
- Copy of BSc and MSc degree and grade reports
- The application should be submitted in both hard copy and soft format.
 - In soft copy: To the promoters (see their emails above)
 - In hard copy: Prof Enyew Adgo (Wisdom Tower, 4th Floor Room Nr. 409, BDU-IUC Office)
- Before 12 April 2023, 4 p.m.

Procedure

After screening for eligibility, the applicants will be evaluated and ranked by a selection committee of the BDU-IUC project. The top-ranked eligible candidates will be invited to a written test on 17 April 2023 at Bahir Dar University, and shortly thereafter to an interview (18-20 April).

Names of selected candidates will be transmitted to the Executive Director for Academic Affairs at BDU and to the relevant Educational Board in Belgium, for academic acceptance. The PhD programme is expected to start on 1 September 2023. Study stipends while in Belgium will be at PhD level (VLIR-UOS standards). Applicants implicitly agree to these procedures. For more information on the procedure and eligibility criteria, please contact Prof. Enyew Adgo (enyewadgo@gmail.com). For more information on the PhD research, please contact the promoters via their emails (see above)