

**MSc research support opportunity on River Morphology:** The BDU-IUC would like to select one potential MSc student for the following research topic:

### **Morphological changes and river bank dynamics of the Gumara and Ribb rivers**

**Background:** Literature learns us the influence of various natural and anthropogenic activities taking place within the catchment on the morphology of rivers. In spite of a number of studies carried out in Lake Tana basin, the effects of the developmental activities and other natural and man-made incidents on the channel structure of the basin's tributary rivers have not yet been addressed. Abate et al. (2015) have, however, assessed morphological changes of the lowermost stretch (38 km) of the Gumara river. This river is the second largest river draining to Lake Tana and its catchment is characterized by intense human impact and variable geomorphic settings. Elevation ranges from 1788 m (Lake Level) to more than 4000 m (Mount Guna). Floodplains are very wide in the downstream and central part of the catchments but very narrow to non-existing at other locations where the rivers are more incised. Abate et al. (2015) highlights despite the lack of detailed understanding and documentation of the responses of the rivers to changes (man-made and natural), the available literature in the international context shows that studying river responses to changes will give an opportunity to know the dominant processes that make the banks to collapse and the bed to aggrade or degrade. Furthermore, the effect of collapsing river banks of both rivers on the alluvial sediment storage is not yet understood and quantified. Meanwhile, learning the drivers of such changes in the fluvial system will help us to understand whether the process is mainly human and/or natural induced and to implement sustainable catchment management practices.

**Objective:** this research work will have the following general-objectives

- To analyze morphological changes in a perspective of its natural and anthropogenic drivers
- To examine river bank dynamics and its impact on the floodplain sediment storage loss

**Region:** Gumara and Ribb catchments, Lake Tana Basin, Bahir Dar, NW Ethiopia

**Activities:** This topic involves a wide range of research activities including field-based identification of various natural and anthropogenic factors affecting the morphology of the Gumara and Ribb rivers and assessment of the bank stability (dynamics) by interviewing the local community (farmers), but also GIS and RS analysis of different satellite images and aerial photographs. Local supervision by Girma Worku and Dr. Mengiste Abate.

**Expected outcomes:**

- Natural and anthropogenic morphological change drivers of the Gumara river will be singled out
- Effect of river bank dynamics on loss of floodplain sediment storage will be understood



Pictures showing active cracks (red lines) on the banks of the river which is about to collapse

NB: GIS and remote sensing skill could have an added value

### **The successful applicant should:**

- Currently be an MSc student in Hydraulic Engineering, Water resources Management, natural resource management and any related
- Has good knowledge of GIS and RS and experience of working with aerial photographs
- Be already MSc student at Bahir Dar University
- Have an interest in fieldwork
- Have obtained above 2.75 during his/her BSc studies

### **The MSc research**

- Will contribute to the BDU IUC project “Land Resilience (P2)”
- Research time: 2019/20 AY
- Advisor in Ethiopia: Dr. Mengiste Abate and Girma Worku (PhD student at KU Leuven)
- For more information, please contact Dr. Mengiste ([mengisteaba@gmail.com](mailto:mengisteaba@gmail.com)) or Girma ([graceworku@gmail.com](mailto:graceworku@gmail.com))
- In addition to the advisors the MSc student will benefit from the support by the IUC programme in terms of logistics, research materials and operating costs

### **Submission of application**

- Application letter and CV (including telephone number of 3 reference persons)
- Copy of diploma and grade reports of BSc programme
- Concept note on the proposed MSc topic
- All to be submitted in soft and hard copies
- All documents are to be submitted to BDU-IUC office, wisdom tower, 4<sup>th</sup> floor, room 409 or via [banchigizeabesha@gmail.com](mailto:banchigizeabesha@gmail.com)
- Application deadline is on the 26<sup>th</sup> of August,2019 at 5 PM