



Sentinel 2nd CALL FOR PROPOSALS

DOCTORAL RESEARCH SCHOLARSHIPS UNDER THE PHD GRADUATE TEACHING ASSISTANTSHIPS AT RUFORUM MEMBER UNIVERSITIES

Call ID: RU/2018/GTA/DRG/03

APPLICATION DEADLINE: 15 February 2019

About the Call

By 2050 demand for food in Africa is projected to grow by 2.5 to 3 times the level of 2015. At the same time, Africa continues to import a lot of its staple food, with the African Development Bank estimating that over US\$35 billion is spent on food imports. This figure is expected to rise to US\$125 billion by 2050. For the past decades, growth in agricultural production has arisen as much via increases in land under agriculture as via yield increases. As a result, agriculture has become the key driver of deforestation in Africa, resulting in loss of biodiversity and ecosystem services. These will ultimately impact on human wellbeing by degrading the natural resource base on which people depend for a living. At the same time, agricultural development can disadvantage poorer, more vulnerable groups - for example, when large-scale agricultural investments threaten their land rights. **Future agricultural development will need to address trade-offs between economic, environmental and social outcomes** to make progress on Sustainable Development Goals 2 (zero hunger), 10 (reduced inequality) and 15 (protection of terrestrial ecosystems).

The Regional Universities Forum for Capacity Building in Agriculture (RUFORUM) is part of a consortium of institutions implementing the four (4) year Social and Environmental Trade-offs in African Agriculture (Sentinel) Project (<https://www.sentinel-gcrf.org/>) funded by the UKRI Global Challenges Research Fund (GCRF- (<https://www.ukri.org/research/global-challenges-research-fund/>)). The Project aims at building the capacity of African and UK research organizations to design and deliver high quality, relevant and state-of-the-art research related to this major challenge of trade-offs between economic, environmental and social outcomes. Sentinel explores, in collaboration with decision makers in government, civil society and the private sector, the impacts, risks and trade-offs within and between social, economic and environmental dimensions of different agricultural development pathways in three African countries: Zambia, Ethiopia and Ghana.

The project focuses on three research clusters listed below:

1. **Understanding agricultural expansion:** Historical trends and current status of agricultural expansion (into natural habitats such as forests, shrubland, wetlands, etc.), its major socio-economic, political and biophysical (e.g., climate change) drivers, and the likely future extent, nature and location of agricultural expansion under alternative assumptions and scenarios;

2. **Understanding the socio-economic and environmental impacts of expansion:** In particular impacts on the livelihoods, wellbeing and resource access for poor and vulnerable people - both those expanding their agriculture, and those affected by habitat loss in these areas; and impacts on ecosystem functions and services for the wider landscape;
3. **Understanding trade-offs:** within and between socio-economic and environmental outcomes under alternative scenarios for agricultural development, and the policies and political economy influencing these.

Research Scholarships Available

As part of the process of enhancing knowledge on the trade-offs between Sustainable Development Goal 2, 10 and 15, Sentinel is making available through RUFORUM a total of 27 Research scholarships for PhD students to undertake research in areas of relevance to the Project. The Scholarships will be provided through a series of Calls for Proposals.

The First Call for Proposals awarded seven (7) research scholarships. This Second Call will provide a further up to twenty (20) research scholarships for students registered under the RUFORUM Graduate Teaching Assistantship (GTA) Program. Students who are not under the GTA Program will also be considered but must undertake their studies at RUFORUM member universities (a full list of RUFORUM 105 Member Universities can be found at www.ruforum.org). Of the twenty, a minimum of five research scholarships each will be allocated for research taking place in Ghana (5), Ethiopia (5) and Zambia (5) in the Sentinel research sites (to be identified by April 2019). **Please note that students outside the focal countries are eligible and encouraged to apply as long they conduct their research in the three Sentinel countries and research sites (Ghana, Ethiopia and Zambia).** The other remaining five scholarships will be flexible in terms of location of the research, but must be aligned to the overall Sentinel themes. The Scholarships will support costs related to doctoral research activities over two years.

During this second round (2nd Call for Proposals), we would like to invite applicants to propose research on one of the following topics (**see Annex 1 for further details**).

1. **Environmental impact of agricultural expansion under different development pathways:** What is or what has been the environmental impact of agricultural expansion in Africa, and what may future impacts look like? This research should involve a review of existing literature and data, and a field-based analysis of the impacts of agricultural expansion in specific 'hotspots' (where there appears to be a tension between increasing agricultural production and conserving terrestrial ecosystems such as forests, wetlands etc.).
2. **Social impacts of agricultural expansion under different agricultural development pathways:** As in 1. above, but focusing on social impacts (such as impacts on equality, farmer empowerment, control over natural resources and other means of production etc.).
3. An analysis of the **conditions favouring success (enabling condition, critical success factors) in efforts in the agriculture and/or the forestry sector to better manage the trade-offs**

between agricultural production and conservation of the remaining natural forests and woodlands. This will be based on one or more success stories identified. This will require a holistic analysis exploring issues of governance and political economy alongside technology development and extension.

4. An analysis of the **effectiveness of current land use planning mechanisms / approaches** taking into account social and environmental impacts of agricultural development pathways.

For general information on Sentinel please visit the Project Website at <https://www.sentinel-gcrf.org/>

The Scholarship Awards

Each scholarship is a maximum of **\$7,500** over a period of two years and is intended to provide funds for students to carry out credible research in line with the Sentinel Project. It is expected that of the 20 students, at least five will be selected in each of the project focal countries (Ghana, Ethiopia and Zambia) receive scholarships towards research in the Sentinel research areas and topics indicated above. More details on the research areas are included in Annex 1.

Scholarship Application Documents

Graduate Teaching Assistants and other eligible potential PhD students should submit their research proposals that clearly articulate: title, problem statement, justification, objectives, hypotheses, activities and methodology, detailed budget and expected outputs. All proposals are expected to be well aligned to the Sentinel Project themes / research clusters and demonstrate direct collaboration with the Sentinel Project team. The proposal must have a plan for disseminating findings from the research. The entire proposal should be a maximum of 10 pages (A4) with 1.5 line spacing.

Scholarship Proposal Review Process

RUFORUM relies on the professional expertise, experience and judgment of external reviewers. All proposals will be reviewed by at least two external reviewers. Reviewers will be objectively critical while at the same time offering suggestions for improving the proposals, even for those being recommended for major revision or rejection. The emphasis for the reviewers is on the academic and scientific rigor of the proposal.

The external reviewers will mainly use the following criteria to judge/rank proposals.

- i. Overall project design, content and articulation/write-up.
- ii. Appropriateness/relevance and contribution to Sentinel project research questions and relevance to the Project research (themes proposed above, and in the annex).
- iii. Research relevance to the three target countries (Ghana, Ethiopia and Zambia) for the Sentinel Project.
- iv. The originality, innovativeness and contribution to science or development.

- v. Research activities clearly defined.
- vi. Clear identification of pertinent research issues, achievable objectives which are aligned to the Sentinel Project.
- vii. Evidence of a good understanding of the literature and rationale for the research project.
- viii. Well-articulated methodological approach with evidence of good understanding of applicable methods
- ix. Clearly articulated engagement process with key stakeholders throughout the research process, and pathway for dissemination of results to communities, academia and, where appropriate, to service agencies, partners and policy-makers.
- x. Feasibility: Can the PhD student achieve this in the time available and is it of the expected standard for a PhD?

Scholarship Award process

Successful applicants will receive Grant Award letters which specifies the amount of the grant, purpose and responsibility of the grant recipient and the university in monitoring the use of the grant funds and reporting requirements. Scholarships awarded are published in the RUFORUM News and are posted in the RUFORUM website (www.ruforum.org).

Mentoring and Skills Enhancing for the Awardees

This is an important component of the Sentinel project scholarships and all successful awardees will be facilitated to attend skills enhancement training (short courses, retreats, workshops and scientific conferences). Further to this, attempts will be made to match awardees with a mentor in their field of specialization to develop competencies required to carry out effective research, good relations with partner communities and agencies and the publication and dissemination of results. The Sentinel Project aims to link awardees with Project mentors in the United Kingdom and target partner countries.

Reporting requirements

Grant beneficiaries are required to submit half-yearly progress reports on time, through their supervisors, to allow close monitoring by RUFORUM Secretariat.

Time frame

The foreseen time frame for the award process is as follows:

- i. The deadline for receiving applications at RUFORUM Secretariat is **15th February 2019** 5.00 pm Uganda time.
- ii. Administrative check/compliance review and feedback to applicants by **30 February 2019**
- iii. Shortlisted proposals sent out for review by Technical Committee by **7th March 2019**
- iv. Review of Proposals by Technical Committee and Sentinel project scientists and selection completed by **20th March 2019**
- v. Successful applicants informed electronically by **30th March 2019**
- vi. RUFORUM Secretariat sends out Scholarship Award letters by **15th April 2019** scholarships funds disbursed by **1st May 2019**

Proposal Submission

How to apply for a scholarship via RUFORUM Information Management System (RIMS)

1. Open this website link: <http://rims.ruforum.org/>
2. If you don't have an account, you will be asked to register here: <http://rims.ruforum.org/contacts/register/>
3. After registering successfully, you will be taken to your dashboard. What you see on your dashboard depends on the permissions that you have been assigned by the RIMS Administrator.
4. If you happen to have captured your email in RIMS, the system might tell you that your account already exists. If this is the case then follow the steps related to resetting your password/forgotten your password

What to do if you have forgotten your password or need to reset your password

1. Open this website link: <http://rims.ruforum.org/>
2. Instead of logging in, Click "Forgot Password"
3. You will be asked to enter your email address and then click reset password
4. The link to enable you to reset your password will be sent to your email address. Please also check for this link in your spam folder in case it is delivered to your spam. Follow the instructions to reset your password
5. Use your email and the new password to log into RIMS
6. After successfully logging on you will be taken to your dashboard. What you see on your dashboard depends on the permissions that you have been assigned by the RIMS Administrator

How to log on if you have an existing account

1. Open this website link: <http://rims.ruforum.org/>
2. Click to log into RIMS by entering your email as the username and your password

After successfully logging on you will be taken to your dashboard. What you see on your dashboard depends on the permissions that you have been assigned by the RIMS Administrator.

How to submit a scholarship application via RIMS

1. After successfully logging on click 'Apply for a Scholarship'
2. Choose correct call ID which is **RU/2018/GTA/DRG/03**
3. Complete the online application form

Help Line: For help during online submission and more information please contact David Ekepu – Project Technical Specialist (d.ekepu@ruforum.org) or Ms. Molly Akello – Technical Specialist Staff Development and Academic Mobility (m.akello@ruforum.org)

Annex 1: SENTINEL research questions and proposed PhD topics

The SENTINEL research questions/ proposed PhD topics are provided below. Detailed information on each of the topics can be provided as needed.

Theme 1: Understanding the dynamics of agricultural expansion into forest habitats in Zambia, Ethiopia and Ghana

1.1 What have been the main drivers for agricultural expansion in the past, and how have they changed over time?

- Could consider macro-level drivers – climate change, demographics, land shortage, demand for food and cash crops – or micro-level drivers that are about how these macro-level drivers' impact on decision-making at household or farm level.
- At the farm level: Could be analysed from a Cost-Benefit Analysis (CBA) angle, to assess what the costs and benefits are to land owners associated with land sparing/sharing.
- Could include characterising the food system behind agricultural expansion in terms of its actors, their activities, their drivers and the outcomes – considering the interactions and relationships between actors and their activities, and drivers of their actions that have contributed to agricultural expansion in the past and how these interactions might have to change to deal with expansion.

1.2 Where has agricultural expansion happened in the past?

- This question would have to deal with the extent of agricultural expansion by generating some statistics on the changes and go further to examine the types of agricultural practices that have contributed to the expansion

1.3 (Related to 1.1 – farm-level issues): What determines the values local communities place on adjacent natural lands?

- This would provide some insights into whether communities see value for themselves in areas of natural habitat being protected from agricultural expansion, students would have to consider appropriate valuation methodologies

1.4 How has agricultural expansion happened in the past / what has been the nature of the expansion – i.e. what is the agricultural system that has replaced the forest/ natural habitat?

- Expansion by whom (family farms, investors, agribusinesses, etc) and does agricultural expansion differ when led by women or men?
- Using what agricultural practices (including whether local varieties or improved, local crops or others, fallow cycles), resulting in which different land-use intensities that change over time?
- Resulting in what sort of farming system and landscape?

1.5 Is future agricultural expansion likely to differ from historic expansion? If yes, how and why? (this is again about the nature of the expansion – see 1.4)

- To consider also new driving forces of expansion and how they relate to the wider food system in each country (consider demand side changes/dietary shifts, trade issues, cultural change, etc.)

1.6 Where is agricultural expansion most likely to happen in the future? Why? Where is agriculture viable in each of the three focal countries?

- This question could be answered using GIS modelling to determine areas likely to change in the future. Special attention should be placed on forest fringes that are often encroached upon. Land use suitability analysis is certainly appropriate for determining suitable areas for possible agricultural expansion into forest areas. It is however, unlikely to experience much changes in protected areas of high biodiversity unless law enforcement is weak.
- This could involve a spatial analysis of land-use and land cover that would enable a PhD student to identify relationships between yield and land-use/land cover type. Then, they could determine whether there are areas that are not 'priority' trade-off/conservation areas as they are not viable for agricultural development.

1.7 (Related to 1.6): How can foresight methods be used to inform current decisions that drive agricultural expansion and what are their pros and cons?

- This could be a chapter in a dissertation about why and how thinking about the future and exploring future uncertainties can inform decision making by different actors in a complex system such as the food and agriculture system.

1.8 What might the extent of that agricultural expansion be (under national food self-sufficiency objectives)?

- This question is formulated to explore the impact of changes in the food system on agricultural expansion. One could also look at it the other way around – “What are the implications of agricultural expansion on food supply, demand and nutrition?”

1.9 Does protection protect natural areas? To what extent have governments been successful in preventing agricultural expansion into protected areas?

- Protected areas (PAs) includes forest reserves which seem to have been generally more effected that wildlife parks and reserves. The research could explore, where expansion into PAs has occurred, why protection failed (lack of resources for enforcement, weak governance etc.), etc.
- Links to, "where has agricultural expansion happened in the past/where is it likely to in the future", "what have been the impacts", "how do institutional and governance arrangements constrain or support ... "
- This could be approached from a number of different angles – using both a quantitative approach and a qualitative approach. This is about where agriculture expands into non-agricultural land and whether governments have been able to control that expansion through the use of protected areas. There is quite a large literature on this in the environmental economics literature.
- Quantitatively one might employ something like propensity score matching or difference in difference to determine whether the presence of protection slows expansion. To determine "protection" would require perhaps the IUCN classification of land, and then a more detailed look at enforcement budgets.

1.10 Where do areas of likely agricultural expansion and high biodiversity / ecosystem functions and services currently overlap?

- Overlap of agriculture with areas of high biodiversity and ecosystem services may have to focus on investigating forest fragmentation as most high biodiversity landscapes are protected areas that may not experience extensive deforestation/degradation but pockets of losses. In this case the study methodologies may have to focus on forest fragmentation.
- This question could enable a PhD student to explore how agriculture and biodiversity can/cannot coexist and whether there are conditions that appear to promote this (that we could include in future predictions/scenarios). For example, the student might find that a given soil type, precipitation level, or other factor might be shared in areas that are high biodiversity and also used for agriculture.

Theme 2: Understanding the impacts of agricultural expansion into forest habitats in Zambia, Ethiopia and Ghana

2.1 How has agricultural expansion impacted on food production and food security at national level?

- Probably not a full PhD research question, but more of a scene-setting for a 'bigger' question. Should be relatively easy to answer – by looking at area of expansion and what crops are grown there (if we have land-use maps).

2.2 What have been the socio-economic / livelihood impacts of agricultural expansion (disaggregated by gender, age, ethnicity, wealth status)? Who gains and loses with agricultural expansion?

- Impacts on (1) those individuals / communities expanding into natural habitats / forests and (2) on those depending on these habitats for their livelihood and food security
 - i. Could look at the extent of resource use of rural households, covering more tangible (i.e. wood stocks/crops) and un-tangible (i.e. pollinator/pest control) aspects.
- How does agricultural expansion affect households' access to non-farm food, fibre, and fuel?
 - ii. Qualitatively or quantitatively one might study communities living near to protected areas - how do they interact if at all with the protected area. If we can find an example of where a government has actively tried to increase protection, how has that affected communities with regard to access to agricultural land/NTFPs including fuelwood/fodder, etc. Or, if we can find examples where agricultural expansion has occurred, how communities have benefited (from additional agricultural land) or been harmed. Can communities detect losses, or do we need to go to the science for that?
- How does agricultural expansion into natural habitats affect local communities? (Links to RQ above, but could also look in a more qualitative approach, such as using individual histories etc. through case studies of different communities)

2.3 How men, women, and children are affected by agricultural expansion and are socioeconomic impacts different among these different groups? Do women and children benefit more from conservation measures than from agricultural expansion?

- Links to / overlaps with 2.2

- Agricultural expansion will affect different social groups in the population differently. This research topic will investigate how policies, processes and outcomes relating to agricultural expansion have different impacts on men and women, youth and other social groups, including the marginalised. It will look at how formal and informal institutions, policies and social norms interact with processes of agricultural expansion to create these impacts.
- The particular focus of this social impact assessment (with an emphasis on equity and justice considerations) will depend on the context of agricultural expansion in specific countries and localities – whether social difference is primarily around gender, age, ethnicity, wealth status or category of resource user (smallholder farmer, pastoralist, communal land user, commercial producer), acknowledging the intersections among these. Equity aspects relate to access to opportunities and rights to agricultural land and natural resources and resulting outcomes for poverty and social differentiation in terms of incomes and influence.
- To what extent are notions of equity and social justice articulated in national level policy documents, problem analysis and policy statements. What weight or importance is given to equity vs. environmental and productivity issues. Who are considered morally significant actors - who counts and whose rights are paramount? What forms of differentiation are recognised?
- What level of coherence is there among agricultural and non-agricultural policies and programmes concerning different social groups (e.g., agricultural development opportunities, migration, social safety nets, gender, livelihoods, urban development, investment plans, social safety nets, poverty reduction targets, etc.)?
- What capacity is there among decision makers to understand equity and its different forms and intersections? Does local knowledge count in policy processes? Does experiential and contextual evidence count? Are there mechanisms and networks through which voices of different groups can be heard?
- In selected location(s) of past or current agricultural expansion (forest, wetlands, other - depending on country), what are the patterns and trends in social differentiation and equity, including distribution of access, capabilities and power which enable or constrain opportunities for specific social groups in agriculture and shape forms of discrimination in rural societies?
 - How are land and resource rights of different groups and the formal rules and customary norms that govern them affected by agricultural expansion?
 - How has agricultural expansion affected wealth-based differentiation (i.e. poorer farmers versus better off, and identity-based differentiation, e.g. spatial, ethnic, racial, age related, gender, disability, sexuality etc. and their intersections)?
 - What have been the social consequences for different groups? (e.g., dispossession, eviction, migration, social conflict, food insecurity, nutritional deficiency, homelessness, unemployment, destitution in old age, etc., or positive impacts such as profitable commercial production, market access, increased income and livelihood benefits)
- Analysis of equity and gender will inform broader analysis of trade-offs between different development pathways. It will expose the consequences of choices and the ethical dilemmas of choosing between different categories of winners and losers.

2.4 What are the likely future socioeconomic impacts of agricultural expansion (under different scenarios)? How do these impacts differ from past impacts? Why?

2.5 How could policies and regulations help to mitigate against negative impacts and enable positive impacts for the poorest / most vulnerable people?

2.6 What have been the environmental impacts of agricultural expansion into natural habitats / forests at different scales (local, landscape, national)?

- Specifically, what have been the impacts on agrobiodiversity, biodiversity overall, and other ecosystem functions and services?
- What have been the impacts on the extent and quality of natural habitats, where extent is area of intact or semi-intact habitat and quality is measured in terms of a) species and/or functional richness and abundance, b) connectivity (i.e. degree of fragmentation and extent to which natural habitats are connected), and c) conservation value (numbers of threatened and endemic species). Species richness and/or abundance can be measured for birds and mammals, major plant groups, major invertebrate groups, or wherever taxonomic knowledge is most complete.
- Could look at the impacts of agricultural expansion on other environmental variables: soil quality, level of pollutants in water systems

2.7 What are the likely future environmental impacts of agricultural expansion (under different scenarios)?

- How do these differ from past impacts and why?

2.8 How could policies and regulations help to mitigate against negative environmental impacts and enable positive impacts?

- How have policies fared in the past (e.g., were they successful, and how do we measure success?) and what does this suggest for the design of future policies?
- Ideally we would want to consider environmental and social impacts (under 2.4 and 2.5) together, not completely separate - and this analysis across potentially competing objectives should not be left until cluster 3.

2.9 How can we best measure the environmental impacts of agricultural expansion?

- A student could compare biodiversity measures (e.g., phylogenetic, functional, and taxonomic) to see whether some measures are more informative in some situations/countries/areas than others
- A student could measure extent and quality of natural habitats (e.g., through analysis of satellite images to investigate degree of fragmentation and connectivity, area of degraded versus intact habitats, plus field biodiversity surveys at different trophic levels, etc.). There are lots of standard ways this could be done.

Theme 3: Understanding the trade-offs within and between social, economic and environmental dimensions of agricultural expansion into forest habitats in Zambia, Ethiopia and Ghana

3.1 What are currently the key trade-offs between food production and reducing deforestation / biodiversity loss?

3.2 What are the factors causing these trade-offs?

- Could include a range of factors, such as (obviously) shortage of land, but also other contributing factors such as shortage of fertiliser which causes people to “nutrient mine”, or shortage of labour, which constrains agroecological practices.

3.3 How would these change over time (under different future pathways of agricultural development that are possible under alternative future scenarios)?

3.4 How can we quantify the trade-offs between food production and biodiversity loss across space and through time?

3.5 How do land-management practices influence the trade-offs between productivity and biodiversity loss?

3.6 How have land policies and land governance contributed to managing these trade-offs in the past? What is the potential for land policies / land governance to do that in the future?

3.7 What are the enabling conditions for better management of trade-offs?

3.8 What is the potential for land-use planning to contribute to managing these trade-offs?

3.9 How do institutional and governance arrangements constrain or support the management of these trade-offs?

3.10 How can we work with different actors on the agricultural and food system to visualize potential trade-offs today and enable a new dialog and decision making around managing the trade-offs differently in the future?

3.11 How does foreign investment shape the future of agricultural development and trade-offs between food production and biodiversity loss?

- The student could use case studies from other countries and determine whether the findings are also applicable to SENTINEL focal countries by comparing the landscapes, crops, markets, etc.

3.12 What are the trade-offs between the social and economic benefits and costs associated with intensive agricultural production and the loss of ecosystem services at different spatial scales?

- The idea would be to explore how agricultural specialisation causes trade-offs between economic benefit and ecosystem functions that vary with the spatial scale of specialization which, in turn, can be influenced by market functioning.