



## Call for Application for PhD Candidates in Integrated Agriculture Productions under the UR-Sweden Research Training Partnership Programme 2019-2024

### 1. Background

The University of Rwanda – The College of Agriculture, Animal Sciences, and Veterinary Medicine (CAVM- UR) - in collaboration with the Swedish University of Agricultural Sciences (SLU), Sweden through the Research Training Partnership Programme, Rwanda (2019/24) has received funding from the Swedish International Development Agency (SIDA), Sweden, to implement a research and training programme entitled: **Integrated Agriculture Productions (IAP)**. The programme integrates three broad thematic areas: 1/ Integrated farming systems, 2/ Climate smart agriculture production systems; and 3/ Healthy and nutritious agriculture production systems. The major outputs will be 7 PhD holders (2 sandwich PhDs at SLU and 5 local PhDs at UR-CAVM). The major outcomes will be the promotion of quality, multidisciplinary and impactful research; further development of supervising skills for CAVM staff; an enhanced culture of publication and scientific exchange; collaboration with farmers, the private and public sectors and policy-makers; and administrative/academic structures and systems supporting innovation and promoting a vibrant research environment.

The University of Rwanda is inviting committed potential candidates to apply for two Sandwich based PhD positions in Integrated Agriculture Productions starting January 2020. The PhD students will be registered at SLU, Sweden but field research will take place in Rwanda. According to the Sandwich PhD training model, students are expected to spend 6-7 months per year in Sweden and carrying their research activities at UR, Rwanda for the remaining period of the year. The students will be jointly supervised by professors and senior researchers from both SLU and UR.

### 2. Research themes/ areas for the Sandwich programme

The proposed sandwich research training under the IPA program will focus on two areas:

1. Integration of urban organic waste stream into integrated agriculture systems (under **Climate smart agriculture production systems**)
2. Strategies for improving the impacts of Eucalyptus tree planting on crops and water resources in rainfed agriculture (under **Integrated Farming Systems**)

### **Research area 1: Integration of urban organic waste stream into integrated agriculture** **Background and Rationale:**

Solid waste management in many low-income countries often have a great proportion of recycling of valuable fractions, e.g. metal, hard plastics. However, the organic waste is not considered to be valuable and therefore often end up at landfills. In a study performed in Uganda, over 90% of the waste taken to landfills was demonstrated to be biodegradable (Komakech et al. 2014). At the same time there is a lack protein to be used for fish feed and plant nutrients to fertilise the fields. Treating the organic waste, including agricultural waste, with invertebrates have the potential of solving these two problems.







In the invertebrate assisted waste management, using either earthworms or fly larvae, highly valuable products are generated: treatment residue that can be used as fertiliser and animal biomass that can be used as animal feed (Lalander et al. 2015a; b). Generating high-value products introduce a shift in the organic waste value-chain and the increased revenue permit a reduced total cost of treatment.

**Actions:** 1) Identification of potential waste streams eligibly for invertebrate assisted treatment in urban and peri-urban Rwanda. 2) Evaluation the efficiency of process parameters and schemes for improved recovery of plant nutrients and proteins in the biodegradable urban and agricultural waste. 3) Evaluation of risk in terms of disease transmission within the recovery system. 4) Evaluate product quality of the generated products as feed and fertiliser.

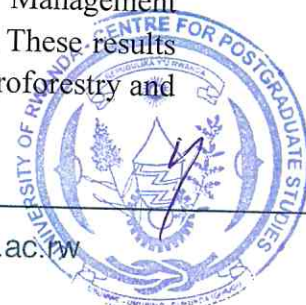
**Expected results:** 1) Identification of potential waste streams; 2) Proposed treatment systems for productive waste management for local production of sustainable feed and fertilisers; 3). Evaluation of the potential hygienic and environmental risks associated to the proposed invertebrate assisted waste management strategy.

**Research area 2: *Strategies for improving the impacts of Eucalyptus tree planting on crops and water resources in rainfed agriculture.***

**Background and Rationale:** *Eucalyptus* species are widely used in Rwanda (Ndayambaje and Mohren 2011) and across the tropics (Paquette and Messier 2010) because of their exceptional wood production. They are used both in industrial plantations and by small holders in wood lots or scattered among crops and is increasingly an important source of fuel wood and income for farmers. However, the use of Eucalypts is controversial because they are said to deplete water resources, compete with crops and suppress biodiversity. Despite the widespread use of Eucalypt by small farmers, most studies on water and nutrient use of Eucalypt come from industrial monoculture plantations (Jackson et al. 2005). Recent studies indicate that trees may have positive effects on soil and ground waters when at intermediate tree covers (Ilstedt et al. 2016). We have little knowledge on water use and competition with other trees and crops in mixed-species plantations which limits our ability to predict water use on the field and over catchments.

**Actions:** Study water use of Eucalypts and the spatial effects on soil water resources and soil/plant interactions along a gradient of tree densities in agroforests and mixed species plantations. Test management strategies for degreasing the negative effects on competition and water use, while maintaining economic values for small holders.

**Expected results:** The negative effects on water use and crop interactions previously seen in intensively managed industrial Eucalyptus plantations is negligible or positive when planted at appropriate densities in agroforestry systems or mixed tree plantations. Management interventions such as pruning will further decrease competition and water use. These results will improve management and policy recommendations and improve present agroforestry and watershed models.







### 3. Funding

The funding for these PhD positions will be supported by Sida through UR Sweden Program for Research, Higher education, and Institutional Advancement.

### 4. Admission

The two potential PhD Candidates are expected to express their motivation and interest to undertake the PhD programme in the area of Integrated Agriculture Productions for a maximum period of four years from date of registration. Applicants must qualify and meet the admission criteria and conditions both at UR and SLU. The following are key eligibility criteria:

#### 4.1. Eligibility Criteria

- Be a Rwanda Citizen;
- Hold a Masters Degree in agriculture and allied sciences;
- Candidates from collaborating Rwandan government Institutions (e.g., RAB, NAEB) are eligible and invited to apply, provided UR has reached an agreement with these institutions on the future mutually beneficial use of the acquired expertise. Such candidates shall have to produce commitment letters from their respective institutions to release them to undertake the PhD on Sandwich model;
- Readiness to adhere to UR capacity building policies and regulations;
- Readiness and ability to conduct research in a collaborative way;
- Proof of English proficiency (i.e., TOEFL or equivalent);
- Interest and passion for integrated agriculture production systems;
- Priority is given to UR and women staff all other things being equal in order to bridge the gender gap and promote research capacity of UR;
- Predisposition to listening and learning

#### 4.2. Key documents to support the application

**The following documents are required to support your application:**

- Application letter addressed to the Ag. Director of the Centre of Postgraduate Studies of the University of Rwanda [Max: 1 page];
- Certified copy of your Masters' degree relevant to this PhD program;
- A cover or motivation letter stating your interest in this programme and the gap to bridge after your PhD research and education [ Max: 2 pages];
- Curriculum Vitae demonstrating your previous experience relevant to this PhD program plus the publication or academic experience [ Max: 3 pages]
- Indicative PhD Project proposal. This should comprise (1) the background, (2) the problem statement demonstrating the research gap and the current art of science in the area of research of interest among the three thematic areas; (3) the methodology and anticipated sources of data to be used, (4) how you intend to make this project successful and what you see as future challenges in undertaking this research, (5) five to ten key references well documented likely to inform this study, (6) other relevant additional statements. [ Max 5 pages].
- Three recommendation letters: one from the current employer, one from your previous supervisor, and the other from any other reference person (former employer or professor).





## 5. Important dates

- Application deadline: **10<sup>th</sup> October, 2019**
- Conduct interviews and selection of the successful PhD candidates: **15-18<sup>th</sup> October, 2019**
- Notification and Appointment of the new PhD candidates to the IAP Program: **25<sup>th</sup> October, 2019**
- Starting period of the PhD program in Sweden: **13<sup>th</sup> January, 2019**

## 6. How to apply

- The hard copy application files shall be submitted to the office the Director of the UR-CPGS at the UR Head-Quarters (Gikondo);
- A soft copy of the application shall be sent to Mrs. Gloriose Umulisa Gashayija, Scholarships Officer at UR-CPGS (email: [gashayijagloriose@gmail.com](mailto:gashayijagloriose@gmail.com)) with Cc to the Subprogramme Team-leader (Dr Guillaume Nyagatare, email: [guillaumenyagatare@gmail.com](mailto:guillaumenyagatare@gmail.com)) and the deputy team leader (Dr Simon Rukera Tabaro; email: [simon.rt@gmail.com](mailto:simon.rt@gmail.com)).
- Eligible applicants will be invited for an interview for the final selection of the candidate

For more information and further clarifications can be addressed to Dr. Simon Rukera Tabaro, Deputy Team Leader of the Programme. E-mail: [simon.rt@gmail.com](mailto:simon.rt@gmail.com).

*Done at Kigali, on 30<sup>th</sup> August 2019*



**Dr Celestin NTIVUGURUZWA**

*Acting Director, University of Rwanda Centre for Postgraduate Studies (UR CPGS)*

