



PhD Topic 1: Understanding and exploiting farm- household heterogeneity to strengthen agricultural and rural development

An increasing number of scientific studies documents heterogeneity across farmers in relation to the impact of agricultural and rural development programs. The landscape of smallholder farmers is diverse, and one needs to move away from one-size-fits-all type of policies and programs to support rural development, poverty reduction and food security. The critical question in development research is moving from ‘What works best?’ to ‘What works best for who?’ The science of farm-household typology as well as the inclusion of heterogeneity in impact evaluation have made significant advances in the last decade and can help address this question. However, using the knowledge of typologies and impact heterogeneity in guiding and optimising public and private sector investment and development initiatives is still very limited. In the framework of the Sustainable Development Goals, where multiple objectives are targeted simultaneously, translating this contextual knowledge into action is even more important to achieve meaningful development outcomes and impact for different groups of farmers.

The overall objective of this PhD is to investigate whether and how knowledge on farm-household typology and impact heterogeneity can increase efficiency and return on investment from public and private sector development initiatives in food and agriculture. The PhD will focus on (i) understanding heterogeneity in smallholder banana- and cassava-based agrifood systems in Central Africa, and (ii) experimenting with how approaches that exploit this heterogeneity contribute to better development outcomes. This project will have an initial focus on Rwanda.

Starting research questions include:

- What are meaningful tangible (e.g. farm size, resource endowment) and intangible (e.g. willingness to experiment, ability to take risks) characteristics to better understand the heterogeneity in farmers’ adoption, use and impact of agricultural innovations (e.g. use of fertilizer, planting practices)?
- How may these farmer characteristics be different in relation to different types of innovations (e.g. how important is land ownership when proposing innovations in perennial versus seasonal cropping systems)?
- What are the actual value and benefits (e.g. for food, income or nutrition security) of agricultural technologies for different types of farm-households;
- How to best develop a farm-household typology to guide development program design and implementation? What determines heterogeneous impacts and matters most for adoption and profitability of specific agricultural innovations?



- How can government, public and private development organizations use this information to better target their programs? How much diversity can practically be handled in large-scale development programs?
- What are the various advantages (e.g. increase in return on investment?) and disadvantages (e.g. larger initial investment? Increased program complexity?) when using a client-tailored approach instead of a 'one-size-fits-all' approach?

Institutional context and supervision

- The PhD student will be enrolled in the PhD program at the Catholic University of Leuven (KU Leuven) in Belgium on a sandwich PhD scholarship. The total duration of the PhD is 4 years, of which 18 to 24 months in total will be spent in Belgium.
- CIALCA provides so-called 'sandwich' PhD scholarship. The 'sandwich' modality implies that PhD candidates receive a stipend when in Belgium, and that their Rwandese academic or research institute provides salary when the PhD candidate is conducting fieldwork in their respective country. The PhD scholarship covers all operational costs related to the implementation of the research.
- The PhD candidate is expected to spend 100% of his/ her time on the PhD assignment during the 4 years, which implies that are exempted from their ongoing duties and responsibilities in their institute.
- Professor Miet Maertens from KU Leuven and Professor Marijke D'Haese from Ghent University will serve as promoter and co-promoter.
- The project is part of the CIALCA consortium and network and will be co-supervised by researchers from CGIAR centres IITA and Bioversity International, as well as with national research and development partners.

Who is our ideal candidate?

Required for this position:

- Enthusiasm for research in general and for agriculture and environment in particular;
- Holder of an EU MSc degree in Bioscience Engineering, Agricultural Engineering, Agricultural Economics, Development Economics, Natural Resources Economics or another relevant field of Applied Economics or Bioscience Engineering and having obtained at least a distinction (cum laude);
- Candidate has published at least one publication In an ISI Thompson Journal (preferably as first author);
- Research and analytical skills that provide a starting point for completing the above-described PhD project;
- Proficiency in data management, quantitative data analysis and statistics (econometrics), and experience with statistical packages;
- Having previously completed at least one individual research project (e.g. a MSc thesis);
- Proficiency in English;
- Good verbal and written communication and collaborative skills;
- Good skills on scientific paper writing;
- Be currently employed by a national agricultural research institution or local university in Rwanda;



- Have Rwandese nationality.

Desirable for this position:

- Experience with public or private sector development initiatives.
- Proficiency in French

Application procedure:

- Applicants are to submit a concise letter of motivation, a detailed CV, the names of at least 3 relevant referees, and copies of BSc and MSc diplomas and transcripts indicating all courses and obtained degrees;
- Applications are to be submitted to Professor Miet Maertens (miet.maertens@kuleuven.be) before 30 June 2018, midnight (Brussels time);
- Only short-listed candidates will be notified;
- Short-listed candidates are subject to an interview and written assessment.