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policy analysis on growth and employment



Canada



The Gender Gap in Smallholder Agricultural Productivity: The Case of Cameroon

Theme 4: Productive Employment in Rural Farm and Non-farm Sectors – Increasing Labour Productivity and Reducing Factor Market Imperfections

REVISED RESEARCH PROPOSAL

Presented to

Partnership for Economic Policy (PEP)

By

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Cameroon

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Before you begin

Please make sure you carefully review and understand the following:

- Webpage – for priority themes, eligibility criteria and application procedures
- Guidelines – for designing a research project proposal (in scientific terms - section III)
- PEP requirements and strategy for policy engagement and research communication (section IV)

Please note that:

- This template is mandatory
- Plagiarism is strictly forbidden – see note on “references and plagiarism” at the end of this document/template. PEP will be using a software program to detect cases of plagiarism.
- PEP encourages applicant research teams to submit proposals in English, but content (in text boxes below) may also be written in French or Spanish.

There are three main dimensions to all PEP-supported projects: **capacity building, research and policy engagement**. Each dimension must be considered with due care and attention as they will be assessed individually and concurrently to determine the overall quality of a proposal.

The PEP proposal template is structured in five sections:

1. Project overview and objectives
2. Capacity building – team composition and experience
3. Research – literature review, method and data
4. Informing policy - context, relevance, process and dissemination
5. Other considerations

SECTION I – PROJECT OVERVIEW & OBJECTIVES

1.1. Abstract (100 to 250 words)

State the main research question, the context and its relevance in terms of evidence-informed policymaking, in relation to PAGE priority issues. Complete with a brief description of the method and data that will be used.

Promoting smallholder agriculture is a crucial component of any strategy towards agricultural development in Africa. Africa’s agriculture is dominated by women, but female plots are less productive than male plots. Understanding the extent and correlates of this gender gap is of great interest to policy makers. Using plot-level data from Cameroon, OLS and decomposition techniques, this research project investigates (1) how the different gender indicators – female household head, *de jure* female household head, *de facto* female household head, female plot owner, and female plot manager – affect the magnitude and drivers of the gender differences in small-scale agricultural productivity, and (2) how the results vary spatially i.e. across agro-ecological zones. The research project uses data set from a multi-crop survey of smallholder household farmers undertaken by the Cameroonian Institute of Agricultural Research for Development (IRAD) in 2009. The sample consists of 1,200 households and 3,075 plots in 125 villages across the three major agro-ecological regions e.g. the Sahel, western highlands, and bimodal humid rain forest.

1.2. Main research questions (max 500 words)

Explain the focus (or key questions), including the gender-sensitive aspect, of your research and its relevance for policy.

Conventional wisdom holds that in sub-Saharan Africa (Africa), nearly 75% of the extreme poor reside in rural areas and agriculture constitutes their main occupation. Africa's agriculture has three main characteristics: it is grossly fragmented into a myriad of small-scale farms, dominated by female labour, and productivity is generally low, and even lower for female farmers compared to their male counterparts (FAO, 2009, 2011; Kilic et al., 2015; Ali et al., 2016).¹ Against this backdrop, it is widely agreed that smallholder-led agricultural growth would contribute most to improved food security and reduced poverty across the continent. Further, women play a key role in food security on smallholder farms (Quisumbing et al., 2014). Therefore, a better understanding of gender differentials in smallholder agricultural productivity is crucial for designing effective policies to close the gender gap while sustainably enhancing small-scale farm productivity.

Across Africa, a range of empirical studies have examined the magnitude and drivers of gender gap in agricultural productivity using the sex of the household head as the gender indicator (Chavas et al., 2005). The bulk of evidence from this strand of literature is mixed for many reasons e.g. the nuances of different typologies of households, implicit assumption of a Pareto-efficient intra-household decision-making on the allocation of resources e.g. land, inputs, etc. (Udry, 1996; Quisumbing, 1996; Doss, 2001; Peterman et al., 2011).

The plot-level analysis appears to capture more of the gender productivity gap (Kazinaga and Wahhaj, 2013; Doss, 2018). In this context, a number of studies have been conducted across the continent but mostly in East, Southern, and West African settings (Udry et al., 1995; Akresh, 2005; Alene et al., 2008; Goldstein and Udry, 2008; Aguilar et al., 2015; Oseni et al., 2015; Slavchevska, 2015; Kilic et al., 2015; Ali et al., 2016; Theriault et al., 2017). To our knowledge, the evidence in the Central-African context is rather limited. Moreover, the gender indicator varies across past studies at plot-level, ranging from household headship to the gender of the plot manager, and the plot holder, while the plot owner is the least common approach due to the scarcity of sex-disaggregated data on land ownership. The use of different gender indicators allows the identification of how gender and decision-making of different household members affect agricultural productivity. In addition to household headship as well as *de jure* and *de facto* headships, our sample distinguishes between the plot owner and the person that actually farms it; this allows the identification of which household member's decisions need to be enhanced to increase productivity. In the analysis of the gender productivity gap, the agro-ecological zones where farmers operate matter i.e. they may lead to pronounced regional differences in agricultural productivity between male and female plots (Akresh, 2005; Slavchevska, 2015). That is, the male-female differences in agricultural productivity may vary significantly between regions with heterogeneous climatic and ecological conditions as well as differences in gender cultural norms and traditions.

This project explores the following two research questions.

- Does the use of different indicators affect the magnitude of the gender gap in agricultural productivity and its underlying factors? The gender variables to be used in the study include female household head, *de jure* female household head, *de facto* female household head, female plot owner, and female plot manager.
- Do the extent and correlates of gender gap in agricultural productivity differ for farmers living in different agro-ecological regions of the country?

¹ For example, FAO (2009, 2011) note that in Africa, women comprise 50% of the agricultural labour force and manage plots that are 20-30% less productive than male-managed plots.

The Cameroonian case is of particular interest. Given, the underrepresentation of studies on gender differences in agricultural productivity in the Central African setting, the current research project is a valuable contribution. The country's economy relies heavily on agriculture, the most employer of the active population, contributor to GDP, and provider of budgetary resources (Njikam and Alhadji, 2017). Like many other countries in Africa, agriculture in Cameroon is dominated by subsistence farming where small-scale farmers make up the majority of producers, and is crucial for the livelihood of most rural households (Yengoh, 2012). Given the country's challenges of feeding an increasing population and empowering the vulnerable and socio-economically backward segment of the population e.g. the rural female farmers, it is of critical importance to inform how gender inequalities are associated with lower productivity.

1.3. Main contributions (max 500 words)

Describe why and how you expect this research/evidence to contribute to addressing important knowledge gaps, both in terms of scientific contributions* and to inform policymaking.

For the gender-sensitive aspect, explain the potential usefulness of your work for gender-oriented policy.

*The literature review shall be detailed under "Research" (section III), not in this section.

In the context of evaluating differences in agricultural production as well as the underlying factors along gender lines, a number of studies have been conducted across Africa using household headship as the gender indicator. Conclusions from this literature are mixed. Further, the use of headship in gender analysis is problematic because its definition is not clear. It is acknowledged that plot-level approach is more appropriate in analyzing gender differences in agricultural productivity (Doss, 2018). In this context, the choice of the gender indicator matters i.e. it significantly affects the study results.

The current research project also uses plot-level data. In contrast to previous studies our analysis applies various gender variables of choice i.e. (i) female head of household, (ii) *de jure* female head of household, (iii) *de facto* female head of household, (iv) female plot owner, and (v) female plot manager. This allows us to understand how the magnitude and underlying factors of the gender productivity gap vary along the gender indicator, and to obtain more robust results. Likewise, most previous studies in Africa did not examine how the gender productivity gap varies spatially, failing so to account for the impact of agro-ecological conditions as well as differences in gender norms in the gender-productivity gap nexus. In consideration of this, we also contribute to the literature by examining whether estimates vary across agro-ecological regions of Cameroon.² Finally, a number of studies on gender differences in productivity have been conducted across Africa but mostly in the case of East, Southern, and West African context. It would therefore be an interesting research to examine the gender gap for Central African countries like Cameroon while utilizing plot-level information.

There is mounting evidence that reducing the gap in productivity between male and female plots plays a significant role in poverty reduction and improved nutritional outcomes. Hence, addressing the issue of gender gap using different gender indicators may offer guidance to policy makers. For example, providing the evidence on the size and drivers of the gender productivity gap can help policy makers to decide where efforts are most needed e.g. making current agricultural policies more gender responsive or designing new agricultural policies that are gender targeted. Further, the findings using different indicators can help in the design of policies intended at increasing agricultural productivity and reducing

² For example, the dry ecology may burden women with additional activities, e.g. fetching firewood and water that reduce the time spent on farming activities thereby reducing their productivity. Likewise, the production costs may be higher in the dry ecology relative to other agro-ecological zones. For example, because of higher costs of irrigation in the dry ecology area, men and women may have greater needs for fertilizers and herbicides. In this context, women, who often face gender-specific serious constraints in accessing productive resources may experience lower productivity.

gender inequalities in agriculture. Finally, because estimates are likely to vary across agro-ecological regions and hence by cultural context, better gender targeted agricultural policies can be designed with more geographically focused results.

SECTION II – CAPACITY BUILDING

2.1. Team composition and experience

For each team member, please indicate (using the following tables – one per member):

1. **Age, sex, and relevant training, experience and/or expertise** (start with team leader).

Note that:

- Teams must be composed of both **researchers** and **government officials/officers**:
 - Four (4) **researchers** - including one senior/experienced researcher, acting as team leader and at least two researchers aged under 30 - with a sufficient academic and/or professional background in economic policy analysis. In particular, having a master’s degree/diploma or being currently enrolled in a master’s program is considered a minimum requirement (generally, team leaders should have a doctoral degree/diploma or be currently enrolled in a doctoral program). These members should describe their relevant training and experience in the issues and research techniques involved.
 - Two (2) government officials/officers from (and with their involvement sanctioned by) the institution in charge of the policy/program that the research aims to inform. These **government-affiliated members** must have a good understanding of the relevant policy processes and priorities but are not required to have research experience.
- Applicant teams must be gender mixed, with female members representing at least 50% of all members (including the team leader) and contributing substantively to the project. PEP encourages teams with a female leader.
- All members of applicant teams must be African nationals (and reside in Africa for the duration of the project).
- Priority is given to projects in low-income economies, and/or fragile or conflict-affected situations (LIE/FCS) but proposals are welcomed from all African countries (including North Africa).
- A researcher can be funded as a team member a maximum of three times by PEP (no more than twice as team leader) and should show marked progression over time.
- A researcher who is already involved in a funded project is not eligible to submit a new proposal before the approval of the final report of the currently funded project.
- Each listed member must post an up-to-date CV in their profile on the PEP website – refer to “How to submit a proposal” and the eligibility criteria on the call [webpage](#).

2. **Benchmark and expected capacity building:**

- Describe the capacities that each team member (and potentially her/his affiliated institutions) is expected to build through their participation in this project. This is an important aspect in the evaluation of proposals and should be presented in detail.
 - What techniques, practices, literature, theories, tools, etc. will each team member and her/his institutions learn (acquire in practice) or deepen her/his knowledge of?

- How will these skills help each team member in their career (development) and/or professional responsibilities?
 - What is each team member's current state of knowledge with regard to the project you are proposing?
3. **Task and contributions to project:** Indicate the specific tasks each team member would carry out in executing the project.

Note that, in this particular initiative, while all outputs should be focused on the research-policy nexus and produced through a collective and coordinated effort, PEP will provide more specific training/support for:

- *Researcher* team members to take the lead in developing a high-quality scientific research paper (i.e. reporting the process of and results from methodological applications).
- *Government-affiliated* members to take the lead in developing a “policy paper” (i.e. positioning the research and findings within the country's broader policy contexts and strategies).

Team leader

Name	Age	Sex (M/F)	Highest degree/diploma
Ousmanou Njikam	52	M	Ph.D. in Economics
Training and experience	Ph.D. in Economics (International Economics), Senior Lecturer, Faculty of Economics & Management, University of Yaoundé II, Cameroon. Expertise: Microeconomic Modelling of Cross-Section and Panel Data, International Trade, Microeconomic Analysis of Firm Data, Household Data, Poverty and Inequality.		
Expected capacity building	Deepen knowledge and practice of applied microeconomic techniques, decomposition techniques, and data. Deepen knowledge of literature on gender analysis. Deepen experience in organizing conferences bringing together academia and policy makers. Also, this research project constitutes an excellent opportunity to build up my leadership and organizational skills. The project is also expected to enrich Mr. Njikam research skill to a great extent. For example, the training programs and research network offered by PEP will undoubtedly be an empowering experience.		
Contribution to project	Guide the younger members of the research team. Mr. Njikam other prime responsibilities will be (i) to write the report, (ii) conduct the literature review, (iii) finalize the methodology, (iv) supervise the econometric analysis, (v) finalise the analysis, and (vi) write the article to be published in a review. In sum, I will take the lead role in implementing this research project, and will be the focal person.		

Researcher #2

Name	Age	Sex (M/F)	Highest degree/diploma
Therese Zogo Elomo	33	F	Ph.D. in Economics
Training and experience	Ms. Elomo holds a Ph.D. in Economics from the Faculty of Economics & Management University of Cheikh Anta Diop (UCAD) Dakar, Senegal where she received a rigorous academic training. She was involved in several research projects funded by AERC, and is		

	actively involved in various other research activities. So, she has an excellent expertise in the analysis of development economic problems facing the developing countries, the use of most econometric software.
Expected capacity building	Because of the small number of female researchers in Economics in Cameroon, this research project constitutes a great opportunity to build the capacity of female researchers. As a fresh graduate, this research project will help to further develop her research capacity. For example, through this research project, Ms. Elomo will be able to gain experience in the theoretical and empirical aspects of regression-based decomposition methods, gender analysis, and Agricultural Economics related literature. Acquire experience with policy consultation and engagement with relevant stakeholders and organizing outreach activities. Gain experience in communicating results to wider audiences.
Contribution to project	The specific tasks of Ms. Elomo will include: guide and monitor the data and gender variables of choice construction; guide and supervise empirical estimations; contribute in writing the final.

Researcher #3

Name	Age	Sex (M/F)	Highest degree/diploma
Coralie Paloma Mbengono	29	F	M.Sc in Economics
Training and experience	She holds an M.Sc in Agricultural Economics from the Faculty of Economics & Management University of Yaoundé II in Cameroon. She has experience in the field of trade and agricultural economics.		
Expected capacity building	Through this research project, she will be able to enrich her knowledge and strengthen her research capacity; she could acquire experience working with survey data, acquire conceptual experience learning techniques related to the regression-based decomposition methods. Last but not the least, this research project will be extremely beneficial in the accomplishment of her thesis.		
Contribution to project	Ms. Mbengono will collaborate in creating the datasets; she will prepare tables of descriptive statistics and perform descriptive analysis; she will collaborate on estimations as well as gender decomposition; she will prepare the power point presentations for technical and general audience; she will assist in coordinating the policy engagement and communication strategy.		

Researcher #4

Name	Age	Sex (M/F)	Highest degree/diploma
Ingride Phalone Douma Aboosolo	29	F	Master in Business Economics
Training and experience	Accounting, Human resource management.		
Expected capacity building	Acquire experience working with survey data. Acquire conceptual experience learning econometric models as well as practical experience decomposing gender differentials in a determined outcome e.g. agricultural productivity. Ms. Aboosolo will have the scope to		

	work under experienced researchers, and this will help in the development of her research capacity as a Ph.D. student.
Contribution to project	Ms. Abossolo will conduct an extensive updated literature review on the choice of the gender indicator, and the analysis of gender gap in agricultural production. She will construct the datasets and prepare tables of descriptive statistics for the different agro-ecological zones. She will estimate cross-section data models to evaluate the effects of gender indicators as well as other covariates across agro-ecological regions. She will prepare tables of regression results for the different agro-ecological regions to include in the final report.

Government official/officer #1

Name	Age	Sex (M/F)	Highest degree/diploma
Nkoa Francois Colin	51	M	Ph.D. in Economics
Training and experience	Microeconomics, Game theory		
Expected capacity building	Linking theories to practice		
Contribution to project	Dissemination of results to policy makers.		

Government official/officer #2

Name	Age	Sex (M/F)	Highest degree/diploma
Okouda Barnabe	52	M	MSc in Statistics
Training and experience	Statistics & Mathematics		
Expected capacity building	Linking theories to practice		
Contribution to project	Dissemination of results to policy makers.		

2.2. List of past, current or pending (non-PEP) projects in related areas involving team members, including resulting publications (If any)

Indicate the funding institution, the title of the project and related publications, and list the team members involved.

Name of funding institutions	Title of projects and related publications (link)	Team member(s) involved
<i>United Nation Development Fund for Women-UNIFEM.</i>	<i>Title: Women in Informal Cross-border Trade: Empirical Evidence from Cameroon.</i>	<i>Ousmanou Njikam</i>
	<i>Publication (reference): International Journal of Economic & Finance 3(3), 2011, 202-213.</i>	
<i>IDRC, Canada</i>	<i>Title: Trade Liberalization, Labour Market Regulations and Labour Demand in Cameroon.</i>	<i>Ousmanou Njikam</i>
	<i>Publication (reference): International Review of Economics & Finance 43 (2016), 525-541.</i>	
<i>African Economic Research Consortium (AERC)</i>	<i>Title: Financial Liberalization and Growth in African Economies: The Role of Policy Complementarities.</i>	<i>Ousmanou Njikam</i>

	<i>Publication (reference): Review of Development Finance (2017) 7, 73-83.</i>	
<i>African Economic Research Consortium (AERC)</i>	<i>Title: Productivity Spillovers through Backward Linkages: The Role of the Origin of Investors and Absorptive Capacity of Domestic Firms (2019)</i>	<i>Ousmanou Njikam</i>
	<i>Publication (reference): Review of Development Economics 23(2), 2019, 677-701.</i>	
	<i>Title:</i>	
	<i>Publication (reference):</i>	
	<i>Title:</i>	
	<i>Publication (reference):</i>	

2.3. List of past or current PEP-supported projects involving team members, including resulting publications

Project code (e.g. PMMA-12345)	Title of project and related external (non-PEP) publications, if any	Team member(s) involved
	<i>Title:</i>	
	<i>Publication (reference):</i>	
	<i>Title:</i>	
	<i>Publication (reference):</i>	
	<i>Title:</i>	
	<i>Publication (reference):</i>	
	<i>Title:</i>	
	<i>Publication (reference):</i>	
	<i>Title:</i>	
	<i>Publication (reference):</i>	

SECTION III – RESEARCH, METHOD AND DATA

This section should be completed by the team leader and/or research members

3.1. Literature review (1000 to 1500 words)

Explain the specific gaps in the existing literature that your research aims to fill. You might want to explain whether this question has been previously addressed in this context (including key references), and if so, what you intend to achieve by examining the question again. Be sure to include literature that provides conceptual foundations for the gender analysis to be undertaken in your research.

Existing studies in agricultural explain the male-female differences in productivity by gender differences in endowments e.g. (i) access to land and agricultural inputs, (ii) tenure security and related investments in land and improved technologies, (iii) market and credit access, (iv) human and physical capital, and (v) informal and institutional constraints affecting farm/plot management and marketing of agricultural produce (Peterman et al., 2011; Croppenstedt et al., 2013).
 In conducting gender productivity gap analysis, the selection of the appropriate unit of analysis matters. In Africa, the studies evaluating the male-female agricultural productivity differences run the analysis either at the household or plot level. Studies at the household level use a dummy variable identifying

the sex of the household head as the gender indicator (see e.g. Chavas et al., 2005; Horell and Krishnan, 2007). The bulk of evidence from this strand of literature is mixed. As Quisumbing (1996) rightly point out, the biggest shortfall in this literature is that it implicitly assumes Pareto-efficient intra-household input allocation (i.e. the household consists of cooperative individuals with a single set of preference). Moreover, the use of household headship as the gender indicator is problematic because the indicator does not indicate who makes decisions in agriculture or who owns land, crops, or trees i.e. it is not clear how headship is defined (Doss, 2001).

The now-established fact is that household is not a monolithic unit represented by one utility function of all members within the household i.e. household members have different, sometimes competing preferences (Alderman et al., 1995; Kleinjans, 2013). In this context, plot-level analysis of gender as a source of agricultural productivity differences between men and women is more appropriate in capturing the gender productivity differentials.

A number of studies at the plot level have been conducted across Africa, thanks to the availability of appropriate data. These studies link plot-level outcomes to individual managers and /or owners within study households; the magnitude and statistical significance of the estimates on the gender of the plot manager/owner allow the identification of the gender productivity gap. In West Africa, for example, Udry et al. (1995) used detailed plot-level agronomic data from Burkina Faso and find striking evidence of substantial allocative inefficiencies within 150 households in six villages. In the same vein, Udry (1996) found productivity differences between male- and female-managed plots; for the same area Akresh (2005) confirmed these results, while Kazianga and Wahhaj (2013) later attributed the gap to headship management of collective plots, and found no difference between individual male- and female-managed plots. Using dataset from Nigeria and Uganda, Peterman et al. (2011) investigate gender gap in agricultural productivity and find persistent lower productivity on female-owned plots and among female-headed households. Oseni et al. (2015) assume that gender relationships differ across the North and South of Nigeria i.e. the agro-ecological and socioeconomic conditions differ substantially across both regions that gender gap is also likely to vary; using plot-level data, they find that female managers are less productive than their male counterparts in the North and no significant difference in the productivity of male and female plot managers in the South.

Several recent studies have also used plot-level data from East and Southern African countries to explore the extent and correlates of gender differences in productivity. Aguilar et al. (2015) find clear evidence that nonmarried female managers are on average less productive than the average male in Ethiopia. Palacio-Lopez and Lopez (2015), Kilic et al. (2015) look at the gender gap in agricultural productivity in Malawi, providing some evidence that female-managed plots are less productive mainly because of differences in labour market access, credit access, high-value crop cultivation, and household adult male labour input. Slavchevska (2015) finds that output values are lower on female-managed plots compared to male-managed plots in Tanzania; further, the different levels of resources e.g. land area and female family labour decrease the gap, while different levels of male family labour widen the gender gap.

Finally, in Uganda, the analysis of Ali et al. (2016) suggests that greater child care responsibility is the largest driver of the gender gap in agricultural productivity while smaller drivers are differential uptake of cash crops, differential uptake and return to improved seeds and pesticides, and differential returns to male-owned assets. Still in Uganda, De La O Campos et al. (2016) use three gender indicators e.g. female head of household, female plot holder, and female plot manager to investigate how the choice of the gender indicator affect the calculation of the gender gap. They obtained different results depending on the gender variable of choice. Our study is in line with La O Campos et al. (2016); but our data allows us to use more gender variables of choice - female household head, *de jure* female household head, *de facto* female household head, female plot owner, and female plot manager – and so to obtain more robust results. Moreover, with the exception of Oseni et al. (2015) and Slavchevska

(2015), none of the previous studies investigate the spatial heterogeneity in gender productivity differentials. Yet, the variety of climatic and agro-ecological conditions as well as potential differences in gender norms across the agro-ecological areas may lead to pronounced regional differences in agricultural productivity between men and women. A second contribution of our study is that we explore how gender differences in agricultural productivity vary spatially i.e. across agro-ecological zones with heterogeneous agro-climatic and socioeconomic conditions.³ Finally, none of the previous papers examine gender differences in agricultural productivity for Central African countries. That is, thus far research has been skewed towards Western, Eastern, and Southern African countries. As Kilic et al. (2015) point out, ‘*Another limitation observed in the relevant literature is the disproportional focus on West Africa. It is important to investigate the extent and correlates of the gender gap in alternative sub-Saharan African setting with different sets of rights and obligations that differently affect the distribution of productive resources across men and women*’. So, we use a different setting e.g. the Central Africa with potential different sets of cultural norms, rights and obligations within households compared to Western, Eastern, and Southern African settings e.g. individualization of decision-making power in Western Africa, jointly decision-making power in most parts of Eastern and Southern Africa, and a mix of both in most parts of the Central Africa.

In sum, we hypothesize:

H1: The gender productivity differences are sensitive to the choice of gender indicator.

H2: The gender productivity differentials vary by the agro-ecological zone where the farmer resides.

3.2. Methodology (1200 to 1600 words)

Present the specific techniques that will be used to answer the research questions and how exactly they will be used to do so.

- Explain whether you will use a particular technique normally used in other contexts or whether you intend to extend a particular method and how you will do so.
- Explain if these methods have already been used in the context you are interested in (including key references).
- Explain how these methods incorporate and/or are appropriate for addressing gender considerations in your research.
- **For PMMA (microeconomic analysis) proposals only:** It is generally expected that the proposed methodology aims to empirically estimate a causal relationship. In such a case, you should explain potential sources of endogeneity in the context of your research and how the proposed technique(s) would allow the identification of the relevant parameters. You are strongly encouraged to discuss the potential impact mechanisms i.e., the channel(s) through which the “treatment” impacts on your outcome(s). Also, make sure you clearly present the outcome(s), the “treatment” and the sample used in the analysis.

Our analysis follows past studies (e.g. Kilic et al., 2015; Slavchevska, 2015; De La O Campos et al., 2016) and consists of sets of pooled and separate sample regressions for each type of male and female plot according to the gender variable of choice; this allows to determine whether there is a gender gap in smallholder agricultural productivity. Hence, these regressions provide the basis for the decomposition methods. Specifically, to get an idea for the quantitative importance of the factors that

³ Regarding the religious and cultural norms, women in agro-ecological zones mostly Islamic where polygamy is common may be at a further disadvantage in terms of productivity because some Islamic cultural norms are intertwined with access to land, legal provisions surrounding women’s property rights, etc.

explain the gender gap, we proceed with the Oaxaca-Blinder (OB)-type decomposition. Also, we extend the decomposition approach using a recentered influence function (RIF) decomposition to check for gender differences across the agricultural productivity distribution.

1. Gender differentials in smallholder agricultural productivity

Our analysis starts with the following pooled regression,

$$\ln Y_{ijz} = \beta_0 + \beta_1 PL_{ijz} + \beta_2 PD_{ijz} + \beta_3 IC_{ijz} + \beta_4 HC_{ijz} + G_{ijz} + \nu_v + \nu_z + \nu_{ijz} \quad (1)$$

where $\ln Y$ is the natural logarithm of crop production per hectare on plot i in household j from agro-ecological zone z . PL is a vector of plot-level characteristics and inputs (ownership, log plot size, dummies for soil richness, irrigation, remoteness of the plot, fertilizer and pesticide use, and dummies for male, female and child family labour as well as hired labour). PD is the plot-level crop production decisions i.e. dummies for main crops as well as for associated crops, and duration of fallow period. IC is a vector of individual characteristics describing the gender variable of choice associated with plot (age, years of schooling, years of farming experience, civil status). HC is a vector of household characteristics related to family labour, skills, and wealth (number of household adult members, child dependency ratio, agricultural training, and a household assets wealth index). G is the dummy variable for the gender variable of choice. ν_v is a village-level fixed effects capturing heterogeneity in agricultural potential, cultural norms, etc. ν_z is the agro-ecological-level fixed effects capturing the variety of climatic and agro-ecological conditions; and ν_{ijz} is the error term. The respective factor coefficients are β_1 and β_2 , with the latter representing male-female differences in productivity.

The pooled regression Equation (1) assumes that the same technology is available to both male and female farmers (Quisumbing, 1996) and may ignore potential endogeneity resulting on household allocation of plots and crops to male and female plots. Therefore, we then separate regressions of the female and male samples according to the gender indicators,

$$\ln Y_{ijzF} = \beta_0 + \beta_1 PL_{ijzF} + \beta_2 PD_{ijzF} + \beta_3 IC_{ijzF} + \beta_4 HC_{ijzF} + G_{ijzF} + \nu_{vF} + \nu_{zF} + \nu_{ijzF} \quad (2)$$

$$\ln Y_{ijzM} = \beta_0 + \beta_1 PL_{ijzM} + \beta_2 PD_{ijzM} + \beta_3 IC_{ijzM} + \beta_4 HC_{ijzM} + G_{ijzM} + \nu_{vM} + \nu_{zM} + \nu_{ijzM} \quad (3)$$

where F and M index the female and male gender category of plot i 's household head, *de facto* household head, *de jure* household head, owner, or manager.

Land/crop allocation is not random i.e. men often cultivate more profitable crops/plots while women cultivate less profitable ones. Such factors could bear influence on gendered productivity levels. Therefore, we will check the robustness of the results using pooled crop-/soil richness-sample regressions. That is, we will run separate pooled regressions across three main crops e.g. rice, maize, and groundnuts as well as across plots with poor/rich soil.⁴ The coefficients of Equations (1)-(3) will be the basis to identify the quantitative contribution of each factor to the gender gap through decomposition methods.

2. Understanding the mechanism through decomposition

We estimate the gap between male and female plots (headed, held, managed, *de facto* headed, *de jure* headed) in agricultural productivity using the Oaxaca-Blinder (OB) regression-based mean decomposition approach (see Oaxaca, 1973; Blinder, 1973).⁵ The gender productivity, D , can be expressed as the difference in average outcomes between groups based on the linear estimation of the log of agricultural productivity using Equations (1)-(3),

$$D = E(\ln Y_M) - E(\ln Y_F) = E(X_M)' \beta_M - E(X_F)' \beta_F \quad (4)$$

because

⁴ The soil quality is defined base on the farmer perception e.g. very rich, rich, average rich, poor, and very poor.

⁵ For the OB-type decomposition, we will use the Stata base command '*oaxaca*'.

$$E(\ln Y_g) = E(X'_g \beta_g + \epsilon_g) = E(X'_g \beta_g) + E(\epsilon_g) = E(X'_g) \beta_g \quad (5)$$

where $\beta_g \in \{F, M\}$, β_g is inclusive of a constant term, $E(\epsilon_g) = 0$ and $E(\beta_g) = 0$ by assumption.

Following Kilic et al. (2015), from Equation (1) we can obtain the aggregate decomposition equation,

$$D = \text{Endowment Effects} = [E(X_M) - E(X_F)] \beta^* \\ \text{Male Structural Advantage} = E(X_M) (\beta_M - \beta^*) \quad (6)$$

$$\text{Female Structural Disadvantage} = E(X_F) (\beta_F - \beta^*)$$

where β^* is the vector of coefficients estimated from the pooled regression Equation (1) of agricultural productivity in which the gender variable of choice is identified. The endowment effect represents the extent of the productivity gap that can be attributed to differences between male and female plots in terms of the observed covariates. Conversely, the structural effect describes the share of the gap that is sourced in unequal returns to the observed covariates. This effect is subdivided into the male advantage and female disadvantage, which are calculated based on the deviation of the respective group coefficients from the pooled estimates.

In addition to understanding the factors that influence the difference in gender productivity at the means, we will also look at how the results vary across the agricultural productivity distribution. To do so, we will use the recentered influence function (RIF) developed by Fipiro et al. (2009) to expand the OB decomposition by identifying differences by gender at various percentiles of the productivity distribution.⁶ The RIF regression is similar to the OLS regression, but the dependent variable, Y , is replaced by the RIF of the distributional statistic of interest. The RIF is given by,

$$RIF(Y; \nu) = \nu(F_Y) + IF(Y, \nu) \quad (7)$$

where Y is the dependent variable of interest (log harvest value per hectare), $\nu(F_Y)$ is the distributional statistics of interest and $IF(Y, \nu)$ is the influence function corresponding to an observed agricultural productivity Y for the distributional statistics $\nu(F_Y)$. The conditional expectations of RIF is assumed to be a linear function of X ,

$$E[RIF(Y; \nu) | X] = X \beta + \epsilon \quad (8)$$

In the case of quantiles, the RIF is defined as,

$$RIF(Y; Q_T) = Q_T + \frac{(T-1) \{Y - Q_T\}}{f_Y(Q_T)} \quad (9)$$

where Q_T is the population T-quantile of the unconditional distribution of Y , $\frac{(T-1) \{Y - Q_T\}}{f_Y(Q_T)}$ is the influence function; $1\{\cdot\}$ is the indicator function, and $f_Y(Q_T)$ is the density of the marginal distribution of Y .

To estimate RIF, the sample quantile, \hat{Q}_T , and the density at that point are calculated. The density is

obtained using kernel methods (see Fortin et al., 2011). Using the estimates \hat{Q}_T and $\widehat{f}(\hat{Q}_T)$ and plugging them in Equation (9), we get estimates of RIF for each observation. Once we obtain the RIF estimates, we can implement an OB-type decomposition using the estimates of RIF as the dependent variable, rather than Y . The estimates of RIF are regressed on the same set of explanatory variable as in the

⁶ As Kilic et al. (2015) pointed out, ‘... going beyond the ‘average’ farmer and understanding the heterogeneity in constraints faced by farmers with different gender and productivity profiles is crucial for the design and implementation of better targeted interventions aimed at bridging the gap’. We will use the Stata module ‘oaxaca_rif’ to compute the RIF.

traditional OB decomposition previously described. The vector β^* obtained from a pooled regression with a group membership indicator is used for both the aggregate and the detailed decomposition.

3. *Estimates by agro-ecological zone*

Past studies (e.g. Udry, 1996; Akresh, 2005) underlined the importance of spatial differences in agricultural productivity. For example, there may be pronounced regional differences in agricultural productivity between male and female plots because of the variety of climate and agro-ecological conditions, potential differences in gender norms across the country, etc. The research project will also provide estimates of spatial heterogeneity in gender productivity differentials across the three agro-ecological zones in Cameroon e.g. the Sahel, western highlands, and bimodal humid rain forest zones, respectively. To this end, we explore how the magnitude and drivers of gender productivity gap differ across agro-ecological regions by introducing interaction terms i.e. using the dummy variable for each agro-ecological region. As a sensitivity analysis we will also run separate regressions for the three agro-ecological zones.

3.3. Data requirements and sources (1000 to 1300 words)

This is a critical part of the proposal. Explain the reason for your choice of particular databases. You must establish that they are ideal for the policy question you wish to address (including in terms of gender analysis) and that you have or will have access to these data before your project begins. Please consult the [“Guide for designing a research project proposals”](#) for more detail.

3. Data

The study makes use of plot-level data from the IRAD,⁷ a survey of smallholder multi-crop farmers conducted between April-December 2009. The data were collected using a structured questionnaire administered to farmers and include information necessary for productivity analysis at the plot level. There are three modules in the survey: household, producer, and complementary modules. One of the advantages of the producer modules is that they allow us to identify the manager (person in charge of the plot) as well as the owner of each individual plot farmed by the household. When combined with the information in the household modules, we are able to determine the gender and socioeconomic characteristics of each plot manager/owner.

The initial sample consists of 1,488 households farming 4,026 plots across 166 villages. We restrict our sample to plots for which non-zero crop harvest was reported. We also consider plots for which none of our independent variables are missing. Our final sample includes 1,200 household farmers and 3,075 plots in 125 villages across all three agro-ecological zones. This final sample contains 1,712 plot managers (1,104 males and 608 females), 1,057 plot owners (644 males and 413 females), 146 *de jure* plots (71 males and 75 females), and 1,394 *de facto* plots (856 males and 538 females).

Production and productivity. Following Owens et al. (2003), Peterman et al. (2011), and Ragasa et al. (2015), the gross revenues from crop production are calculated by multiplying the harvest quantities (in kilograms) by their unit price.⁸ Unit prices are calculated for each plot by dividing total sales value by the quantity sold. In case a farmer does not sell any of the crops, his/her total yield is multiplied by the median price received by farmers in that specific village. The agricultural productivity is measured as

⁷ Research and development (R&D) of various crops in Cameroon is undertaken by IRAD. It is also a repository of the seed breeding and production, and support technology transfer while ensuring a strong linkage among the various stakeholders, farmers, extension workers, and private sector. We thank Mrs Dorothy Malaa for making the data available.

⁸ The value of production is used because the majority of the plots are intercropped and area estimates for each crop are difficult to calculate.

the natural logarithm of the gross value of output (in franc CFA, the local currency) produced per hectare of land; this will be our dependent variable.

Gender indicators. One of the advantages in the IRAD's survey is that it allows us to identify the holder and manager of each individual plot farmed by the household. In addition to the gender of the head of household as well as *de jure* (e.g. households with widowed or divorced heads) and *de facto* (e.g. migrant household head), we draw upon questions of the survey to construct two additional gender variables e.g. plot owner and plot manager. For the former, the agricultural landownership was collected at the plot level with the question 'Land tenure?'. Responses of (1) owner, (2) tenant, (3) temporary transfer, (4) donation, and (5) other were recorded. So, the survey separates between those plots owned and those in which the reported individual has use rights e.g. renting. Regarding the latter, the survey asked the respondent 'Person in charge of the plot?' allowing the identification of the gender of plot manager (i.e. the person responsible for growing the crops and making day-to-day decision on the crop management e.g. type of crop, when to plant, which inputs to use, etc.). It is worth noting that for *de facto* headship, the question used is the following: 'Is the farmer a native of the village?'

Control variables. They are divided into three groups: (i) household characteristics, (ii) plot characteristics, and (iii) labour and inputs. Household characteristics include age, education, and experience in farming measured in years of the household head, marital status, household size (number of household members e.g. household male and female adults size), child dependency (number of household members aged below 15 and above 64 over those in the labour force i.e. 15-64 years, inclusive), non-farm income, livestock, and the household's wealth position.⁹ The plot's characteristics include land area in hectares, soil richness, costs of irrigation, duration of fallow period, dummy variables for main crops as well as intercropping system, plot distance to home (km), plot distance to tarred road (km), plot distance to the nearest market (km), dummies for access to extension (e.g. access to credit). Finally, labour and inputs include average duration of a working day (hours), family labour, hired labour, use of (in)organic fertilizer, agricultural training, and non-labour inputs e.g. livestock, and agricultural tools index.¹⁰

SECTION IV – INFORMING POLICY

This section should be completed by the government-affiliated members, and validated by the head of their institution (to be confirmed in the required acknowledgement letter).

4.1. Government affiliation

a) Name the government institution at which you are employed, and describe its general mandate N.B. This does not engage the institution itself to sanction, take part in and/or sponsor the proposed research project, other than authorizing the employees identified in section 2.1 (and below) to take part in the related work on a personal basis.

1) *Ministry of Agriculture and Rural Development.* Mandate: (i) Agricultural development, (ii) rural development, (iii) support to agricultural holdings, etc.

⁹ Following past studies e.g. Filmer and Pritchett (2001), Fisher and Kandiwa (2014), the wealth level variable is measured with an index created using principal component analysis (PCA), based on components reflecting household ownership of physical assets (bath tub, mirror, library, cabinet/drawers, bucket, radio-cassette, drum or barrel, sofa, spoon/fork, bed sheet, jerry can, vehicle, pots, broom, straw mattress, radio, motorcycle, stockpots, rifle, TV, bed, bike, modern mattress, mat, stools, chairs, plates, basins, and moped).

¹⁰ The agricultural tools index is also constructed by PCA and captures farmer access to agricultural machinery such as knife, machete, agricultural stores, pick axe, watering can, wheelbarrow, shovel, rake, hatchet, motor cultivator, file, plough, sewing machine, cart, sprayers, disk harrow/harrow, ox for farm work, donkeys, hoes, and tractors.

2) *Cameroon Policy Analysis and Research Center (CAMERCAP-PARC)*. Mandate: (i) assist the government in the formulation and analysis of economic and social policies, (ii) develop managerial capacities in the public administration, the private sector and civil society for the implementation and monitoring and evaluation of public policies, (iii) reinforce youth employment support mechanisms, private entrepreneurship and innovative mechanisms, and (iv) encourage dialogue between the state and non-state actors.

b) What is/are your specific role(s)(as employees) in the institution

Government official/officer #1	
Name	Nkoa François Colin
Title/position	Technical Adviser No2 (fcnkoa@yahoo.com ; Tel. +237 669961915)
Role/responsibilities	Provide technical advice to the Minister of agriculture and rural development on issues pertaining to agricultural development, rural development, promotion of agricultural holdings, etc.

Government official/officer #2	
Name	Okouda Barnabé
Title/position	Executive Director (barnabe_okouda@yahoo.fr / okoudabarne@gmail.com Tel: +237 699934330 / 222225858. Fax: +237 22223421)
Role/responsibilities	Oversee administration, programs and strategic plan of CAMERCAP-PARC. Other responsibilities include marketing, and community outreach.

4.2. Describe the policy context and needs

- a) Describe the specific policy issue(s), questions or needs faced by your institution and that the research project aims to inform - both in terms of socioeconomic outcomes (identify the target/beneficiary population), and the related policy processes (whether it is at the stage of debate, decision, design, implementation, review, reform, etc.).

Explain why the evidence to be produced with this research is important/useful to inform decision-making, especially **with regard to your institution's specific mandate and strategies**.

Cameroonian policy makers have been aware for decades that policies are needed to promote women's empowerment. Despite achieving significant progress in terms of economic growth, and reduction of poverty, there are still increasing concerns in Cameroon about the alleviation of poverty to a socially acceptable level, the rural-urban poverty divergence, the country's ability to meet the food needs of its population, the gender divide, etc. Agriculture is the backbone of Cameroon's economy. A very diverse group of smallholders dominate Cameroonian agriculture, with female farmers dominating and playing an indispensable role in food production. Further, the productivity of female farmers is lower compared to male farmers because of constraints in their access to food production resources (e.g. physical, financial, cultural, and legal).

In order to support its growing population, combat poverty and reduce the gender gap in agricultural production, Cameroon needs to produce more food. With the assessment of the extent and drivers of the gender gap in smallholder agricultural production, strategies aiming at reducing gender differences in agricultural productivity are expected to have significant consequences towards poverty reduction, food security, and women empowerment.

- b) What are the **current policy options/scenarios**, faced by (or available to) decision-makers - in terms of potential interventions, approaches, etc. - in relation to this particular issue?

If possible, also provide a **brief history** of policy initiatives (and related reforms, if any) implemented in the past to address the issue, indicating generally what worked and what didn't (i.e., why is this still an issue?).

Policy makers in Cameroon recognize the critical role of agricultural development in the economic development process of the country. Therefore, various agricultural policies have been implemented. First, the government indirectly assists farmers in the agricultural sector through the provision of scientific, technical, and business information. For example, in conjunction with international organizations e.g. the World Bank and the African Development Bank, government structures (e.g. National Project for Extension Work and Agricultural Training, Support for Peasant Strategies and Professionalism in Agriculture) were set up; these government structures aim providing farmers with economic, business, scientific, and technical information.

Second, in order to increase agricultural productivity, the government actively promoted and provided subsidized inputs to farmers. It is within the framework of this input policy that the National Fertilizer Program was set up in the 1960s and replaced in 1980 by the National Rural Development Fund (FONADER). However, those monopolies proved ineffective in distributing the inputs and increasingly became costly to the treasury (Ingco et al., 2003). In the early 1990s, a new strategy seeks to liberalize and privatize the fertilizer sector through an efficient and sustainable program for the import, distribution, and use of fertilizers.

Third, the improved seed quality policy is also at the center of the government efforts to enhance farmers' access to better quality seeds (MINADER, 2006) – good quality seeds have proven to be instrumental in yield improvements. Hence, in 2005 the government put forward the Support Program for Production and Distribution of Seeds and Planting Materials. Within this framework, the government trains and provides materials in order to stimulate local interest in producing and selling high-quality seeds at affordable prices to smallholder farmers; further, such a seed production is not only a source of income to rural households producing seeds, but also encourages the use of higher quality seeds by food crop farmers. However, in addition to bad governance, funds mobilized remain far below the needs of farmers. In 2006, and in conjunction with the European Union, the government introduced the '*C2D Project*',¹¹ which targets among others improvements in fertilizer use, crop production, and yields among smallholder farmers.

Finally, recognizing that (i) poverty in rural areas remains high and households engaged in agriculture are the poorest, and (ii) there is gender disparity in agricultural productivity, and this gap varies widely across regions and socioeconomic status, efforts have been made to create policies, strategies and programs that benefit women, and work towards eliminating all types of gender discrimination. For example, in order to fix the gender situation within the small-scale farming systems, a number of projects in the National Strategy for the Development of Agriculture and the Rural Sector were created. Thus, for example, the Cameroonian government attempted to address elements of gender inequality in access to resources for agricultural development (e.g. access to land rights, agricultural inputs and investment opportunities) by creating projects such as the Support Program for Agricultural Organizations (PAOPA), and the Project for Capacity Building of Communities (PRCCOM). Both projects aim (i) increasing women's access to a number of inputs that would otherwise not have been available to them, and (ii) revitalize local-level cooperation between women within their common initiative groups and cooperatives. Likewise, the '*C2 Project*' includes provisions to fix the gender bias in small-scale farming. For example, in the sampling procedure, farmers' associations with more than 30% of female and vulnerable farmers were selected from community across the country.¹²

¹¹ '*C2D*' means contract for debt relief and development (contrat de désendettement et développement, in French).

¹² The groups of vulnerable farmers include widow headed households, households with chronic food insecurity, young and HIV/AIDS infested headed households.

However, relatively less attention has been paid by policy makers to access to landed property and titles where the gender imbalance still prevails, especially in rural areas.

c) How do you expect this **evidence will be used/assimilated** effectively into the relevant policy decision/advisory processes? Be as precise as possible, indicating the specific decisions or recommendations that have to be made by your institution.

Are you aware of any cost- or **budget-related considerations** that should be taken into account in the context of these policy decision/advisory processes?

Also, justify the timing of the proposed research project - how does it fit with the **calendar** of the related policy decision/advisory processes?

The evaluation of the extent and the underlying factors of the differentials in agricultural productivity between male and female farmers has important policy relevance.

Firstly, this research proposal can inform the discussion on the gender gap in agricultural productivity by revealing whether the gender variable of choice influences a determined outcome, in our case, smallholder agricultural productivity. The research proposal can also help determine effective interventions to increase smallholder agricultural productivity and reduce gender inequalities in agriculture between male and female farmers. Specifically, the empirical evidence from the current research project will be a key factor in identifying possible levers for policy intervention to improve the productivity of smallholders and reduce the gender gap.

Secondly, the research proposal can help determine additional factors associated with lower agricultural productivity which can be addressed by agricultural and social policies.

Thirdly, by providing more agro-ecologically focused results, the findings from this research proposal will shed light on whether agricultural policies as well as policies that can help reduce gender inequalities between male and female farmers should vary by region.

Finally, the findings of our research proposal would be timely to provide insights to various government strategies to address the gender imbalance within smallholder farming systems.

4.3. Stakeholder mapping and dissemination

List all other potential stakeholder institutions, i.e., institutions that you consider as potential users of the same research evidence (other than your own). These can include other ministries and government agencies, as well as civil society organizations, NGOs, private sector, etc.

Name of institution/organization #1	Ministry of Economy, Planning and Territory Management
List the key representatives or target research users (policy makers or influencers)	
<ul style="list-style-type: none"> - Prof. Isaac Tamba, Director of Economy - Name, title/position 	
Describe briefly why and how you believe this institution could use the evidence	
This is the ministry in charge of economic issues as well as the management of the Cameroonian territory. The evidence from our research project could play an important role to inform and influence policy directions for regional development, namely the development of rural areas.	

Name of institution/organization #2	Ministry for the Advancement of Women and the Family
List the key representatives or target research users (policy makers or influencers)	

<ul style="list-style-type: none"> - Mr. Theodore Mouben, Deputy Director of Family Promotion - Name, title/position
Describe briefly why and how you believe this institution could use the evidence
The Ministry for the Advancement of Women and the Family is in charge among other of women empowerment. In particular, this ministry seeks to promote women’s rights and contributes to the generation of public policies that promote gender equality. The findings from this research could help in formulating policies based on this research e.g. policies related to the empowerment and wellbeing of rural women.

Name of institution/organization #3	IRAD – Institute of Agriculture Research for Development
List the key representatives or target research users (policy makers or influencers)	
<ul style="list-style-type: none"> - Mrs. Dorothy Malaa, Researcher, Coordinator of C2D Rice Project. - Name, title/position 	
Describe briefly why and how you believe this institution could use the evidence	
IRAD is a key institute of agricultural research working under the Ministry of Agriculture and Rural Development. IRAD often seeks policy advices from academics. Therefore, it is important that the authorities and researchers at IRAD be informed of the outcomes of this project.	

Name of institution/organization #4	World Agroforestry Centre (ICRAF)
List the key representatives or target research users (policy makers or influencers)	
<ul style="list-style-type: none"> - Dr. Ann De Grande, Researcher. - Name, title/position 	
Describe briefly why and how you believe this institution could use the evidence	
According to its mission statement, ICRAF is a centre of science and development excellence that harnesses the benefit of trees for people and the environment. The ICRAF’s activities in the Central Africa region focus on the role that farmer-managed natural regeneration plays in delivering agricultural systems that can improve productivity and livelihoods in the parklands of the Sahel. ICRAF also explores how improved planting materials are affecting the contributions of key tree crops to the GDP of humid countries while delivering benefits for climate change and income. Therefore, ICRAF is a potential ally in the outreach and engagement activities of this research proposal.	

Name of institution/organization #5	Ministry of Higher Education
List the key representatives or target research users (policy makers or influencers)	
<ul style="list-style-type: none"> - Mr. Alain Njike, Computer Scientist. - Name, title/position 	
Describe briefly why and how you believe this institution could use the evidence	
The Ministry of Higher Education has tradition to encourage and support, both technically and financially, its staff to publish their completed research as monographs or books. These publications have been highly recognized and widely circulated among the academia as well as the public. The current research is not an exception. It is expected that the results of this research will be published in the monograph form when it is completed. So, this outlet can help us to disseminate our results to a broader audience.	

4.4. Outline your engagement/dissemination strategy

Describe how you intend to engage with these other stakeholder institutions (listed in 4.3) to ensure that they:

- 1) Contribute to informing the research work (i.e. consultations)
- 2) Are kept informed of the research progress and findings

To ensure evidence-informed policy, policy makers will be involved at all stages in the research process. Early in the research project, and in conjunction with the Cameroon Policy Analysis and Research Center (CAMERCAP-PARC), we will organize a one-day workshop where we invite other researchers as well as the representatives of the previously identified stakeholder institutions. This kick-off workshop will establish a direct line of communication between the research team and key policy stakeholders.

As the preliminary results become available, the research team will present the results at an academic seminar e.g. the monthly seminar at the Faculty of Economics & Management, University of Yaoundé II. In order to maintain an active line of communication throughout the project, the research team will invite persons from the user institutions.

When the final results are available, the research team will organize a seminar in collaboration with CAMERCAP-PARC, to disseminate the results of the project. Authorities from the institutions in section 4.3 will be invited to participate as well as researchers. Policy briefs will be widely distributed during this seminar. The research team also aims to present the results of the project at international conferences e.g. the CSAE conference. The researchers also aim to publish the results of their project in a refereed journal.

Our preliminary dissemination strategy is as follows:

Time frame	Event	Audience	Media coverage
1. Initial stage	Kick-off workshop. Presentation and discussion of, (i) national policy context, (ii) research questions, (iii) methodology, (iv) data, and (v) policy relevance of the project.	Researchers, graduate students, policy markers	Yes
2. Middle stage	Monthly seminar: presentation and discussion on preliminary results.	Researchers, graduate students, policy markers	No
3. Final stage	Final workshop. Presentation and discussion of, (i) final results, and (ii) policy recommendations.	Policymakers, researchers, graduate students.	Yes and distribution of policy briefs to policymakers.

Finally, within the framework of a continuous consultation process, the following two stakeholders are peculiarly prioritized. First, the researchers are currently in close collaboration with the Ministry of Agriculture and Rural Development through its Technical Adviser No2 (*Prof. Nkoa Francois Colin* is aware of the research proposal). Then, the Executive Director of Cameroon Policy Analysis and Research Center (CAMERCAP-PARC), *Mr. Okouda Barnabé* is aware of the research proposal; as already indicated, this is a key think tank of Cameroon. We plan to meet both stakeholders every three months over the course of the project.

SECTION V – OTHER CONSIDERATIONS

5.1. Describe any ethical, social, gender or environmental issues or risks that should be noted in relation to your proposed research project.

No ethical, social, gender or environmental issues or risks to be noted.

5.2. References and plagiarism:

Applicants should be very careful to avoid any appearance of plagiarism. Any text of five or more consecutive words that is borrowed from another source should be carefully contained between quotation marks with a reference to the source (including page number) immediately following the quotation. It is essential that we be able to distinguish what you have written yourself from what you have borrowed from elsewhere.

Note also that copying large extracts (such as several paragraphs) from other texts is not a good practice, and is usually unacceptable. For a fuller description of plagiarism, please refer, for example, to the following website:

- <http://writing.yalecollege.yale.edu/advice-students/using-sources/understanding-and-avoiding-plagiarism>

PEP will be using a software program to detect cases of plagiarism.

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