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policy analysis on growth and employment



## **Rural non-farm engagement and agriculture commercialization in Ghana: complements or competitors?**

### **RESEARCH PROPOSAL**

Presented to

**Partnership for Economic Policy (PEP)**

By

**Paul Kwame Nkegbe**

**Hamdiyah Alhassan**

**Benjamin Musah Abu**

**Yazidu Ustarz**

**Edinam Dope Setsoafia**

**&**

**Shamsia Abdul-Wahab**

**Ghana**

May, 2017

## Before you begin

Please consult the following webpages/documents regarding PEP's expectations in terms of:

- [Specific policy issues to be addressed \(and conditions to be met\) by projects supported under this call](#)
- [Scientific content of eligible research project proposals](#)
- [PEP requirements in terms of policy engagement and research communication](#)

Please note that :

- This template is mandatory for proposals of projects submitted under the [PMMA](#) and [MPIA](#) groups, i.e. that do not involve data collection
- 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 (and will be accepted given proper justification of language barrier).

There are three main areas/dimensions to all PEP-supported projects: research, capacity building and policy engagement/impact. The PEP proposal template is structured around these three dimensions. Each section must be completed with due care and attention, as they are reviewed individually and concurrently to assess the overall quality of a proposal.

## SECTION I – RESEARCH

### 1.1. Abstract (100 to 250 words)

The abstract should state the main research question, the context and its relevance in terms of policy issues/needs in relation to PAGE thematic foci, complete with a brief description of the methodology(ies) and the data that will be used.

The effect of the non-farm economy on agriculture has been evaluated at various levels in the literature. However, examining the link between the non-farm sector and agricultural market engagements has remained grey. The literature tends to implicitly assume that the contribution of the non-farm sector to increased output and farm investments would naturally trickle down to market engagements. Thus, no empirical investigation has been conducted to examine the effect of non-farm engagement on market participation. This study aims to employ bivariate probit and endogenous switching regressions to provide empirical evidence on the effect of non-farm engagement on market participation of smallholder farmers in Ghana. We propose to use the Ghana Living Standards Survey Round 6 (GLSS6) to achieve the goal of the study. We expect to uncover factors linking these two concepts and on the basis, provide the needed evidence to inform policy in Ghana.

## 1.2. Main research questions and contributions

Explain the focus (or key questions) of your research and its policy relevance.

Explain why you think this is an interesting research question and what the potential value added of your work might be (knowledge gaps). You might want to explain whether or not this question has been addressed before in this context (including key references), and if so, what do you wish to achieve (in addition) by examining the question again?

Ghana is largely an agrarian economy with the business of agriculture significantly dominated by smallholder farmers who are predominantly rural dwellers (GSS, 2014). Majority of the population in developing countries is rural (IFAD, 2011; UNCTAD, 2015) and at the same time, the predominant livelihood activities of these rural dwellers is farming. Efforts therefore to lift these households from poverty and set them up on the pathway of development has been narrowed to the policy measure of promoting the development of agriculture (UNCTAD, 2015; Ellis & Biggs, 2001; Haggblade, 2007). While this view is not entirely flawed, especially in the past decades, it is becoming obsolete in the advent of a fast developing rural non-farm economy (RNFE) in recent times. UNCTAD (2015) notes that most rural households engage in a range of economic activities other than just farming. Some studies (e.g., de Janvry & Sadoulet, 2001; Buchenrieder et al., 2010) have attributed the growth of the RNFE to decreasing access to farmlands and the need for diversification of risks. In addition, agricultural shocks emanating from poor yields due to climate change and decline in land fertility are reasons for the rapid growth of the RNFE. These reasons are summarized by UNCTAD (2015) with their terminology of entrepreneurship by choice, by necessity and risk management. Other literature (see, for example, Barrett et al., 2001; Reardon et al., 2007) have coined the terms demand-pull and distress-push as way of describing the diversification of farm households into non-farm economic activities.

Given that the bulk of agriculture is dominated by smallholders, the rapid transformation of the agricultural sector due to the rising importance of RNFE should be a major concern to policy makers, scholars and development institutions. This is borne out of the fact that though the RNFE is usurping the role of agriculture especially in the agenda of economic transformation of the rural economy, agriculture still remains important (UNCTAD, 2015). In response to this, the area of farm and non-farm sectors have received and gained wide currency, manifesting, for example, in the depths of empirical studies on the linkage of these two sectors.

The extant literature has demonstrated the linkage of rural farm and non-farm sectors in a number of sub-themes. First, we have such studies linking non-farm activities to income inequality, poverty reduction and welfare (see, for example, Reardon & Taylor, 1996; Reardon et al., 1998; Mollers & Buchenrieder, 2011; Senadza, 2011; Dirven, 2011; Dzanku & Sarpong, 2014). The results have not been very robust and consistent. Second, there is literature linking non-farm activities to productivity, efficiency and cost complementarity (see, for example, Anríquez & Daidone, 2010). A third class of studies link non-farm activities to expenditures on agricultural inputs, food crop investments and food security (see, e.g., Dedehouanou et al., 2016; Babatunde & Qaim, 2010; Smale et al., 2016).

Despite these contributions in the farm-non-farm discourse, the area is still evolving. One area that is surprisingly under-developed (if not missing) is exploring non-farm and farm linkages from the perspective of market participation and agricultural commercialization. Yet, the subject matter of

market participation has been identified as one of the growth poles of rural poor households. As a result, this has generated policy interests among individuals and institutions. Emphasising the importance of market participation, and realizing that the literature is shy of its link to non-farm sector exposes an unmistakable gap.

We note that some of the above literature exploring the effect of non-farm engagement on productivity, efficiency and agricultural investments/expenditures draw an implicit weak conclusion: gains in agriculture (through these dimensions) lead to market participation. But this assumption might not be tenable. To address this lacuna, this study aims to provide response to the following questions:

1. Does non-farm engagement by farm households promote selling of their farm output (market participation), and how?
2. How does non-farm engagement influence the quantity offered for sale (level of commercialization)?

We believe that responding to these questions has policy implications for Ghana and developing economies as a whole. Though the agricultural sector is declining in importance, its contributions to the economy in terms of GDP and employment cannot be written off. Thus, appropriate policy measures are needed from findings germane to the goal of this study. Evidence of the relationship between non-farm engagement and market participation, and the level of commercialization are key microeconomic policy ingredients that can play into sound and evidence-based policy in the area of the ever expanding farm-non-farm nexus.

The specific contribution of this study thus rests on taking a departure from the previous literature by exploring the relationship between farm and non-farm sectors from the perspective of decision to sell and the quantity offered for sale (level of commercialization). The specific objectives are thus to estimate the effect of non-farm engagement on decision to sell and the level of commercialization. Notable empirical evidence in the farm-non-farm linkage in Ghana are the studies of Anríquez and Daidone (2010), Dzanku and Sarpong (2014), Osarfo et al. (2016), Senadza (2011), and Owusu et al. (2011). However, as noted earlier, none of these studies has taken a dimension in the spirit of this current study. For example, Anríquez and Daidone (2010) employed a consistent stochastic distance function approach to examine the effect of non-farm engagement on input demands, production efficiency and cost complementarities. Dzanku and Sarpong (2014) focused on the effect of non-farm activities on two proxies of welfare: wealth and food security.

### **1.3. Methodology**

Presentation of 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).

We borrow the idea from most microeconomic household modelling that stipulates the challenges in empirical estimations due to potential sources of bias. One such challenge is catalogued by Smale et al. (2016) and Dedehouanou et al. (2016) who note the non-randomness of the discrete decision of farm households to participate in the RNFE. For example, households that are closer to towns are

more likely to have the opportunity to engage in non-farm activities and to also sell their produce. Again, households with financial capability can easily travel to towns to engage in non-farm activities or to sell their produce. The implication of all these is the introduction of bias in modelling the farm-non-farm nexus. We propose to exploit natural experiment conditions employing a number of estimation procedures as a way of overcoming these potential biases. These procedures are presented in the following sections in line with the objectives of the current study.

### **1.3.1 Effect of non-farm engagement on market participation**

In our first estimation of the link between non-farm engagement and market participation we posit that the decision to engage in non-farm activity and the decision to sell are potentially endogenous. Farm households may engage in non-farm activities to raise income for investments in farm activities such as purchase of inputs that could culminate in producing beyond consumption needs to participate in markets. Dedehouanou et al. (2016), Babatunde and Qaim (2010) and Smale et al. (2016) confirm this assertion. Due to the potential simultaneous nature, modelling these two decision processes with univariate probit models would lead to biased and inconsistent estimates.

To overcome this bias, we employ the bivariate probit model with the assumption that the error terms of the non-farm engagement model is correlated with the error term of the market participation model. Representing the non-farm decision process as  $NFE$  (which is a dummy equal to 1 if a household is engaged in the non-farm sector and 0 otherwise) and the market participation decision as  $MP$  (which is a dummy equal to 1 if a household sold a particular crop and 0 otherwise), the assumption of correlated normally distributed error terms leads to:

$$\begin{cases} NFE^* = X_1' \beta_1 + \gamma MP + e_1, NFE = 1 \text{ if } NFE^* > 0, \text{ and } 0 \text{ otherwise} \\ MP^* = X_2' \beta_2 + \delta NFE + e_2, MP = 1 \text{ if } MP^* > 0, \text{ and } 0 \text{ otherwise} \end{cases} \quad (1)$$

where  $e_1$  is the normally distributed error term,  $E[e_1|X_1, X_2] = E[e_2|X_1, X_2] = 0$ ,  $Var[e_1|X_1, X_2] = Var[e_2|X_1, X_2] = 1$  and  $Cov[e_1, e_2|X_1, X_2] = \rho$ .

The introduction of  $NFE$  in the  $MP$  model is meant to directly capture its effect on market participation. However, since there is a possibility of a reverse causality (i.e.,  $MP$  also influencing  $NFE$ ), we introduce  $MP$  in the  $NFE$  model to estimate it as a simultaneous system<sup>1</sup>. The significance of  $\delta$  would indicate that non-farm engagement influences market participation decisions, and the significance of  $\gamma$  would confirm reverse causality. Notably, variables entering the  $NFE$  model as  $X_1$  would include at least two variables (e.g., general economic activity in a community and industry of employment of a household) that are not in the  $MP$  model and those entering the  $MP$  model as  $X_2$  would also include at least two variables (e.g., existence of community market, membership of farmer based organization and membership of agricultural cooperatives) that are not in the  $NFE$  model to serve as exclusion restriction variables. These exclusion restriction variables are meant to appropriately identify the models.

<sup>1</sup> The rationale is to derive consistent and unbiased estimates. Otherwise the interest is in the effect of NFE on MP not the other way round.

### 1.3.2 Effect of non-farm engagement on agricultural commercialization

To model the effect of non-farm engagement on commercialization, we specify the following model:

$$HCI_i = f(X_i, NFE_i) \quad (2)$$

where  $HCI$  is level of commercialization of the  $i^{th}$  household measured by the ratio of the gross value of crop sales to the gross value of all crops produced by the same household as proposed by Govereh et al. (2009) and Strasberg et al. (2009);  $NFE$  is as defined before;  $X$  is a vector of household specific characteristics hypothesized to influence commercialization.

Ordinary least squares (OLS) cannot be used to model (2) since there is possibility of selection bias when a household chooses not to engage in non-farm activity. If unobservable characteristics determine household's engagement status, the covariance of  $NFE$  and the error term in (2) would not be zero violating an assumption of OLS. An empirical framework for analyzing (2) is the widely used quasi-experimental design or impact evaluation approaches. The most widely applied in the literature is the propensity score matching (PSM) proposed by Rosenbaum and Rubin (1983). The PSM assumes, among other things, conditional independence which basically states that non-farm engagement by farm households and commercialization are not endogenous. This assumption is untenable given the earlier submission of the potential endogenous nature of non-farm engagement and market participation by producers. Hence, the PSM is not considered.

Following Dedehouanou et al. (2016), we propose to implement the endogenous switching regression (ESR) which takes care of this potential endogeneity and offers the opportunity to predict actual expected levels of commercialization and their counterfactual counterparts.<sup>2</sup> The ESR assumes that there is a switch in the level of commercialization such that households are partitioned into two regimes based on commercialization of participants in non-farm activities and non-participants. Further, it assumes that non-farm engagement and market participation are endogenous. With these assumptions, we specify the ESR as:

$$\text{Regime 1: } HCI_{0i} = \beta_0 X_{0i} + u_{0i} \quad \text{if } \alpha X_i + e_i > 0 \quad (3)$$

$$\text{Regime 2: } HCI_{1i} = \beta_1 X_{1i} + u_{1i} \quad \text{if } \alpha X_i + e_i \leq 0 \quad (4)$$

$$\begin{cases} NFE_i = 1 \text{ if } \alpha X_i + e_i > 0 \\ NFE_i = 0 \text{ if } \alpha X_i + e_i \leq 0 \end{cases} \quad (5)$$

where  $HCI_{0i}$  and  $HCI_{1i}$  are commercialization indices of non-participants and participants of non-farm activities respectively;  $X_i, \alpha, \beta$  are parameters to be estimated;  $u_{0i}, u_{1i}, e_i$  are respective error terms. These are assumed to have a trivariate normal distribution with mean zero and covariance matrix as:

$$\phi = \begin{bmatrix} \sigma_1^2 & \sigma_{12} & \sigma_{1e} \\ \sigma_{12} & \sigma_2^2 & \sigma_{2e} \\ \sigma_{1e} & \sigma_{2e} & 1 \end{bmatrix}$$

<sup>2</sup> Estimating the ESR is a derived activity in this case: we cannot predict the outcomes and the counterfactuals to evaluate the effect of NFE on levels of commercialization without first estimating the parameters of the ESR. Thus, it is a painfully worthwhile exercise to present the theoretical layout of the ESR.

The “*movestay*” command proposed by Lokshin and Sajaia (2004) would be used for the estimation. The command implements a full information maximum likelihood (FIML) simultaneous estimation of (3), (4) and (5) which yields consistent standard errors. The advantage of this over single estimation approach (e.g., using two-step least square or maximum likelihood estimation) is its ability to correct for selectivity bias in commercialization estimates (Lokshin & Sajaia, 2004).

After estimating (3), (4) and (5), we will predict actual expected outcomes in the sample defined as:

$$E(HCI_{1i}|NFE_i = 1) \text{ and } E(HCI_{0i}|NFE_i = 0)$$

and the counterfactual counterparts:

$$E(HCI_{0i}|NFE_i = 1) \text{ and } E(HCI_{1i}|NFE_i = 0)$$

Finally, we will predict the desired treatment effects as:

$$ATT = E(HCI_{1i}|NFE_i = 1) - E(HCI_{0i}|NFE_i = 1) = X_{1i}(\beta_1 - \beta_0) + (\sigma_{1u} - \sigma_{0u})\lambda_{1i} \quad (6)$$

$$ATU = E(HCI_{1i}|NFE_i = 0) - E(HCI_{0i}|NFE_i = 0) = X_{0i}(\beta_1 - \beta_0) + (\sigma_{1u} - \sigma_{0u})\lambda_{0i} \quad (7)$$

where  $\lambda_{1i}$  and  $\lambda_{0i}$  are inverse mills ratio.

#### 1.4. Data requirements and sources

This is a critical part of the proposal. The key issue is to explain the reason for the use of the particular data. You must establish that they are ideal for the question you wish to address 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.

The study will use the Ghana Living Standards Survey Round 6 (GLSS6) household-level dataset. This dataset was collected by the Ghana Statistical Service (GSS) between October 2012 and October 2013. The purpose of the survey is to generate information on living conditions in the country. It used a questionnaire adapted from the World Bank’s Living Standards Measurement Survey and covers a stratified and nationally representative, random sample of 16,772 households in 1,200 enumeration areas. The GLSS6 focuses on the household as the key socio-economic unit. Detailed information was collected on the demographic characteristics of households, education, health, employment, migration and tourism, housing conditions, household agriculture, household expenditure, income and their components and access to financial services, credit and assets. Other modules administered as part of the survey were the non-farm household enterprises, household access to financial services and governance, peace and security.

The GLSS6 has emerged as one of the important and richest dataset on Ghana as it presents a comprehensive, reliable and up-to-date statistics and indicators to monitor and evaluate the impact of development policies and programmes on the living conditions of Ghanaians. This is the primary justification for the use of this dataset. It is capable of meeting the objectives of this study. It has a broad section on non-farm engagements and agricultural production. Further, an earlier version of this dataset (that is GLSS4) has been used by some studies to investigate farm-non-farm linkages (see, for example, Anríquez & Daidone, 2010). The dataset is readily available and has already been procured from the Ghana Statistical Service (GSS).

## SECTION II – CAPACITY BUILDING

### 2.1. List of team members

For all team members, please indicate the age sex, as well as relevant/prior training and experience in the issues and research techniques involved (start with team/project leader).

Note that PEP favors gender-balanced teams, composed of one senior (or experienced) researcher supervising a group of junior researchers, including **at least 50% female researchers**, all contributing substantively to the research project. PEP also seeks gender balance in team leaders and thus positively encourages female-led research teams. (Each listed member must post an up-to-date CV in their profile on the PEP website – refer to “[How to submit a proposal](#)”)

Name	Age	Sex (M,F)	Training and experience
Paul Kwame Nkegbe	38	M	<p><b>Training:</b></p> <ol style="list-style-type: none"> <li><b>Policy Evaluation Methods.</b> A course organized by the Centre for Microdata Methods and Practice (CEMMAP), Institute for Fiscal Studies, UCL London. Tutor: Dr. Barbara Sianesi, IFS. Nov. 30 to Dec. 03 2010.</li> <li><b>Discrete Choice Modelling.</b> A course organized by the Centre for Microdata Methods and Practice (CEMMAP), Institute for Fiscal Studies, UCL London. Tutor: Prof. William Greene, NYU. Jan. 13 to Jan. 15 2010.</li> <li><b>Econometric Estimation of Frontier Functions and Economic Efficiency.</b> A course organized by the Centre for Microdata Methods and Practice (CEMMAP), Institute for Fiscal Studies, UCL London. Tutor: Prof. William Greene, NYU. Feb. 26 to Feb. 27 2009.</li> </ol> <p><b>Education:</b></p> <ol style="list-style-type: none"> <li>University of Reading, PhD Agricultural &amp; Food Economics. Awarded in October 2011.</li> <li>University of Ghana, Legon. MPhil Agricultural Economics. Awarded in December 2005.</li> <li>University for Development Studies, Tamale. BSc Agric Tech. (Agric Econ &amp; Extension Option), First Class Honours. Conferred in October 2002.</li> </ol> <p><b>Experience:</b></p> <ol style="list-style-type: none"> <li>Feb. 2014 -: Head, Department of Economics &amp; Entrepreneurship Development, <i>University for Development Studies</i>, Wa, Ghana.</li> </ol>

			<p>2. Jan. 2014 -: Senior Lecturer, Department of Economics &amp; Entrepreneurship Development, <i>University for Development Studies</i>, Wa, Ghana.</p> <p>3. July 2007 to Dec. 2013: Lecturer, Department of Economics &amp; Entrepreneurship Development, <i>University for Development Studies</i>, Wa, Ghana.</p> <p>4. Oct. 2003 to June 2007: Senior Research Assistant, Department of Economics &amp; Entrepreneurship Development, <i>University for Development Studies</i>, Wa, Ghana.</p> <p><b>Journal Articles (selected):</b></p> <p>1. Abu, B. M., Issahaku, H. and <b>Nkegbe, P. K.</b> (2016). Farmgate versus market centre sales: a multi-crop approach. <i>Agricultural and Food Economics</i>, 4:21. doi: 10.1186/s40100-016-0065-6.</p> <p>2. <b>Nkegbe, P. K.</b> and Ustarz, Y. (2015). Banks performance in Ghana: trends and determinants. <i>Ghana Journal of Development Studies</i>, 12(1&amp;2): 33-52.</p> <p>3. <b>Nkegbe, P. K.</b> and Shankar, B. (2014). Adoption intensity of soil and water conservation practices by smallholders: evidence from northern Ghana. <i>Bio-based and Applied Economics</i>, 3(2): 159-174.</p> <p>4. <b>Nkegbe, P. K.</b> and Abdul Mumin, Y. (2014). Inflation and interest rate movements in Ghana: trends and possible causal links. <i>International Journal of Economics and Business Research</i>, 8(3): 272-295.</p> <p>5. Sekyi, S., <b>Nkegbe, P. K.</b> and Kuunibe, N. (2014). Participation in the credit market by small scale enterprises in Ghana: evidence from Wa Municipality. <i>African Journal of Business Management</i>, 8(9): 292-299.</p> <p>6. Donkoh, S. A., Alhassan, A., and <b>Nkegbe, P. K.</b> (2014). Food expenditure and household welfare in Ghana. <i>African Journal of Food Science</i>, 8(3): 164-175.</p> <p>7. Abdulai, S., <b>Nkegbe, P. K.</b> and Donkoh, S. A. (2013). Technical efficiency of maize production in northern Ghana. <i>African Journal of Agricultural Research</i>, 8(43): 5251-5259.</p>
Hamdiyah Alhassan	37	F	<b>Training:</b> Trained in economics and development

		<p>studies.</p> <p><b>Education:</b></p> <ol style="list-style-type: none"> <li>1. 2013- Present: PhD Candidate, Development Studies, University of Ghana.</li> <li>2. 2008-2010: Master of Philosophy, Economics, University of Ghana.</li> <li>3. 2000-2004: Bachelor of Science with First Class Honours, Civil Engineering, Kwame Nkrumah University of Science and Technology, Kumasi, Ghana.</li> </ol> <p><b>Experience:</b></p> <ol style="list-style-type: none"> <li>1. 2011 -: Lecturer, <i>University for Development Studies</i>, Tamale, Ghana.</li> <li>2. 2011-2013: Tutor, <i>University of Ghana</i>, Distance and Continuous Learning Centre, Tamale, Ghana.</li> </ol> <p><b>Journal Articles:</b></p> <ol style="list-style-type: none"> <li>1. Ehiakpor, D.S, Danso-Abbeam, G., Zutah, J. and <b>Alhassan, H.</b> (2016). Adoption of Farm Management Practices by Smallholder Cocoa Farmers in Prestea Huni-Valley District, Ghana. <i>Russian Journal of Agricultural and Socio-economic Sciences</i>, 9(53), 117-124.</li> <li>2. <b>Alhassan, H.</b>, Frimpong, T. and Asaah, S.M. (2015). Do Ghanaian Rural Consumers Prefer Imported Rice to Local Rice? Evidence from Akuapem North Municipality. <i>Applied Research Journal</i>, 1(3), 24-34.</li> <li>3. <b>Alhassan, H.</b>, and Kwakwa, A.P. (2014). When Water is Scarce: The Perception of Water Quality and Effects on the Vulnerable. <i>Journal of Water, Sanitation and Hygiene for Development</i>, 04(1), 43-50.</li> <li>4. Donkoh, S.A., <b>Alhassan, H.</b>, and Nkegbe, P.K. (2014). Food Expenditure and Household Welfare in Ghana. <i>African Journal of Food Science</i>, 8(3), 164-175.</li> <li>5. Kwakwa, P.A., Wiafe, E.D., and <b>Alhassan, H.</b> (2013). Household Energy Choice in Ghana. <i>Journal of Empirical Economics</i>, 1(3), 96-103.</li> <li>6. Kwakwa, P.A., and <b>Alhassan, H.</b> (2012). Schooling and Working, Working and Schooling: A Descriptive Study of the Challenges. <i>International Journal of Academic</i></li> </ol>
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			<p><i>Research in Business and Social Sciences</i>, 2, (6).</p> <p>7. <b>Alhassan, H.</b>, and Kwakwa, P.A. (2012).The Use of Mobile Phones by Small Scale Farmers in Northern Ghana: Benefits and Challenges. <i>Journal of Entrepreneurship and Management (JEM)</i>, 1(3).</p> <p>8. <b>Alhassan, H.</b>, Donkoh, S.A., and Asante, Y. (2012). The Determinants of Long-term Economic Growth in Ghana from 1960-2007. <i>Journal of Research in Economics and International Finance (JREIF)</i>, 1(5), 141-149.</p> <p>9. Donyong, K.K., Donkoh, S.A., and <b>Alhassan, H.</b> (2012). Perceptions of Development in the Northern Region of Ghana. <i>Journal of Research in Economics and International Finance (JREIF)</i>, 1(6), 169-178.</p>
Benjamin Musah Abu	31	M	<p><b>Training:</b> Trained in the area of agricultural economics and development studies.</p> <p><b>Education:</b></p> <ol style="list-style-type: none"> <li>1. 2013 <b>MPhil Agricultural Economics</b> - University of Ghana, Legon, Ghana.</li> <li>2. 2010 <b>BA Integrated Development Studies (Economics and Entrepreneurship Development Option)</b> with First Class Honours – University for Development Studies, Tamale, Ghana.</li> </ol> <p><b>Experience:</b></p> <ol style="list-style-type: none"> <li>1. Sept. 2016 -: Lecturer, Department of Economics and Entrepreneurship Development, <i>University for Development Studies</i>, Wa Campus, Ghana.</li> <li>2. Sept. 2014 – Aug. 2016: Assistant Lecturer, Department of Economics and Entrepreneurship Development, <i>University for Development Studies</i>, Wa Campus, Ghana.</li> <li>3. 2013/2014: Monitoring associate for International Food Policy Research Institute (IFPRI) Ghana in the piloting of the Ghana Agricultural Production Survey (GAPS) for six months. In charge of six districts in the Upper West and Northern regions of Ghana.</li> <li>4. January 2012 to August 2014P: Senior Research Assistant, Department of Economics and Entrepreneurship Development, <i>University for</i></li> </ol>

			<p><i>Development Studies</i>, Wa Campus, Ghana.</p> <p><b>Journal Articles:</b></p> <ol style="list-style-type: none"> <li>1. <b>Abu, B. M.</b>, Issahaku, H. and Nkegbe, P. K. (2016). Farmgate versus market centre sales: a multi-crop approach. <i>Agricultural and Food Economics</i>, 4:21. doi: 10.1186/s40100-016-0065-6.</li> <li>2. Abu, B.M., Osei-Asare, Y.B. and Wayo, S. (2014). Market participation of smallholder maize farmers in the Upper West Region of Ghana. <i>African Journal of Agricultural Research</i>, 9(31): 2427-2435.</li> <li>3. Abu, B.M. (2015). Groundnut market participation in the Upper West Region of Ghana. <i>Ghana Journal of Development Studies</i>, 12(1&amp;2): 106-124.</li> </ol>
Yazidu Ustarz	35	M	<p><b>Training:</b> Trained in development studies and finance.</p> <p><b>Education:</b></p> <ol style="list-style-type: none"> <li>1. 2010-2012: M.Phil. Business Administration Finance, University of Ghana, Legon, Accra.</li> <li>2. 2003-2007: B.A. Integrated Development Studies with Second Class Upper Honours, University for Development Studies, Tamale, Ghana.</li> </ol> <p><b>Experience:</b></p> <ol style="list-style-type: none"> <li>1. May 2016 -: Lecturer, Department of Economics and Entrepreneurship Development, <i>University for Development Studies</i>, Wa Campus, Ghana.</li> <li>2. Feb. 2014 - April 2016: Assistant Lecturer, Department of Economics and Entrepreneurship Development, <i>University for Development Studies</i>, Wa Campus, Ghana.</li> <li>3. Dec. 2008 - Jan. 2014: Senior Research Assistant, Department of Economics and Entrepreneurship Development, <i>University for Development Studies</i>, Wa Campus, Ghana.</li> </ol> <p><b>Journal Articles:</b></p> <ol style="list-style-type: none"> <li>1. Mustapha, S., Abdulai, I.A. and <b>Ustarz, Y.</b> (2016). Evaluating the Determinants of Access to Ghana Fertilizer Subsidy Program. <i>Asian</i></li> </ol>

			<p><i>Journal of Agricultural Extension, Economics &amp; Sociology</i>, Vol. 11, No. 3, pp. 1-11.</p> <p>2. Nkegbe, P.K. and <b>Ustarz, Y.</b> (2015). Banks performance in Ghana: trends and determinants. <i>Ghana Journal of Development Studies</i>, 12(1&amp;2): 33-52.</p> <p>3. Mumin, Y.A., <b>Ustarz, Y.</b> and Yakubu, I. (2014). Automated Teller Machine (ATM) Operation Features and Usage in Ghana: Implications for Managerial Decisions. <i>Journal of Business Administration and Education</i>, Volume 5, No.2, pp 137-157.</p> <p>4. <b>Ustarz, Y.</b> and Issahaku, H. (2013). Does Rural Bank Credit Make any Difference in the Income Levels and Community Development Effort of Beneficiaries? <i>Advances in Arts, Social Sciences and Education Research</i>, Volume 3, No. 7, pp. 512 – 519.</p> <p>5. Issahaku, H., <b>Ustarz, Y.</b> and Domanban, P.B. (2013). Macroeconomic Variables and Stock Market Returns in Ghana: Any Causal Link? <i>Asian Economic and Financial Review</i>, Vol 3, No. 8, pp.1044-1062.</p> <p>6. Issahaku, H., Dary, K.S. and <b>Ustarz, Y.</b> (2013). Financial Characteristics and Innovations in Microfinance Institutions in Ghana. <i>American Journal of Rural Development</i>, Vol. 1, No. 3, pp. 40-48.</p>
Edinam Dope Setsoafia	30	F	<p><b>Training:</b> Trained in agribusiness.</p> <p><b>Education:</b></p> <p>1. Sept. 2010–Aug. 2012: MPhil Agribusiness, University of Ghana, Legon, Accra.</p> <p>2. Aug. 2005–Jun. 2009: B Sc. Agriculture (Agribusiness option), University of Ghana, Legon, Accra.</p> <p><b>Experience:</b></p> <p>1. June 2016 –: Lecturer, Department of Agricultural and Resource Economics, <i>University for Development Studies</i>, Tamale, Ghana.</p> <p>2. Feb. 2014–May 2016: Assistant Lecturer, Department of Agricultural and Resource Economics, <i>University for Development Studies</i>, Tamale, Ghana.</p> <p>3. Feb. 2013–Feb. 2014: Senior Research Assistant,</p>

			<p>Department of Agricultural and Resource Economics, <i>University for Development Studies</i>, Tamale, Ghana.</p> <p><b>Journal Articles:</b></p> <ol style="list-style-type: none"> <li>1. <b>Setsoafia E.D.</b>, Sarpong D.B., and Kwadzo G. T. M., (2013). Determinants of Direct Marketing Strategy Adoption by Agro SMEs' in the Greater Accra Region. <i>Asian Journal of Agricultural Extension Economics and Sociology</i>, Vol. 2(2), pp. 105-117.</li> <li>2. Danso Abbeam Gideon, <b>Setsoafia E.D.</b> and Ansah Isaac Gershon Kodwo (2014). Modeling Farmers Investment in Agrochemicals: The Experience of Smallholder Cocoa Farmers in Ghana. <i>Research in Applied Economics</i>, Vol 6 (4).</li> <li>3. Amikuzuno J., <b>Setsoafia E. D.</b> and Seini. A.Y. (2015). Regional Integration in Africa: Why Cross-Border Price Transmission and Integration of Agricultural Markets Matter. <i>UDS International Journal of Development</i>, Vol. 1(1).</li> <li>4. <b>Setsoafia, E.D.</b>, Aboah, J. Danso-Abban, G. (2015). Growth and constraint analysis of micro and small agro enterprises in Accra, Ghana. <i>International Journal of Economics, Commerce and Management</i>, Vol. III, No.3.</li> </ol>
Shamsia Abdul-Wahab	34	F	<p><b>Training:</b> Trained in development studies.</p> <p><b>Education:</b></p> <ol style="list-style-type: none"> <li>1. Sept. 2014 – April, 2017: MPhil in Development Studies, University for Development Studies, Tamale, Ghana.</li> <li>2. Aug. 2012 - Nov. 2013: MA Development Studies, University of Cape Coast, Ghana.</li> <li>3. Sept. 2002 - Dec. 2006: BA Integrated Development Studies with Second Class (Upper Division) Honours, University for Development Studies, Tamale, Ghana.</li> </ol> <p><b>Experience:</b></p> <ol style="list-style-type: none"> <li>1. March 2015 -: Chief Research Assistant, Department of Economics &amp; Entrepreneurship Development, University for Development Studies, Wa Campus, Ghana.</li> </ol>

			2. Sept. 2007 - Feb. 2015: Senior Research Assistant, Department of Economics & Entrepreneurship Development, University for Development Studies, Wa Campus, Ghana.  <b>Journal Articles:</b> nil
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**a. Expected capacity building**

Describe the research capacities that team members (and potentially their affiliated institutions) are expected to build through their participation in this project.

This is an important aspect in the evaluation of proposals and should be presented with detail. What techniques, literature, theories, tools, etc. will the team and their institutions learn (acquire in practice) or deepen their knowledge of? How will these skills help team members in their **career development**? What are the current state of knowledge of each team members in regard to the project you are proposing?

<b>Name</b>	<b>Benchmark and expected capacity building</b>
Paul Kwame Nkegbe	Paul has skills in applied microeconomic analysis with focus on technology adoption, efficiency and productivity analysis, household modelling as well as evaluation of policy impacts on smallholder producers, and recently on macroeconomic analysis. The current exercise will seek to further deepen and strengthen his capacity in some of these areas including micro-econometric analysis, especially in labour productivity.
Hamdiyah Alhassan	Hamdiyah is conversant and has skills in microeconomic analysis, poverty and development, and seeks to develop skills in agricultural labour productivity analysis, which the current study aims to achieve.
Benjamin Musah Abu	Benjamin is interested in applied microeconomic analysis and has some level of skills in the area. The current study will thus build and strengthen his capacity in applied microeconomic analysis.
Yazidu Ustarz	Yazidu has skills in macroeconomic analysis and hopes to acquire microeconomic analytical skills in issues relating to labour markets and other factor markets. The current study will thus help build the needed skills to realise an important career objective.
Edinam Dope Setsoafia	Edinam has skills in smallholder agribusiness analysis and hopes to develop advanced skills in microeconomic analysis. The current exercise is therefore expected to help her achieve that.
Shamsia Abdul-Wahab	Shamsia has skills in qualitative analysis and rudimentary skills in quantitative analysis. The current exercise is thus expected to build her skills in quantitative analysis and also help position her to take up an enhanced academic role.

Add comments and describe institutional capacity building if applicable.

Our current state of knowledge in the farm and non-farm linkage is nothing beyond the cursory knowledge of empirical evidence from the literature. We have not implemented any study in this area. Thus, we have theoretical, not empirical knowledge in this area. This project will advance and deepen our current grasp of research in this area. It will strengthen our capacity on econometric methodology to problem solving in general, but specifically in the field of farm and non-farm linkages. One area that should also be pointed out in the capacity building process is that, the project will enable us to come to terms with the current literature not only in the area of this study but also in areas related to the thematic scope of PEP.

The platform to participate in PEP meetings and conferences will facilitate knowledge sharing, network building, and academic and research collaborations which will go a long way to sharpen skills, build capacity and promote interdisciplinary approach to problem solving. These conferences will further expose us to the expanding interaction between the scientific community and institutions that work to better the lives of people. The area of academic and research collaborations are important in building the capacity of our institutions. Undoubtedly, institutions are made up of people. Thus, once our capacities are built on one side, on the other side the capacity of the institution(s) we belong is also built.

We are researchers and we intend to continue to engage in research that would shape policy for the betterment of society. Therefore, the skills to be acquired from running this project will play a crucial role in broadening and deepening our expertise.

Indicate which specific tasks each team member would carry out in executing the project.

- Note that one of the team members must be clearly identified as responsible for coordinating and reporting on the design/implementation of the projects' policy engagement and communication strategy (see section III below). To achieve a more balanced task distribution, PEP advises to select a member other than the project leader.

<b>Name</b>	<b>Task and contribution to the project</b>
Paul Kwame Nkegbe	Paul will serve as the overall supervisor and leader of the project. He will be responsible for providing strategic and technical direction as well as ensuring that high quality standards are met. Econometric modelling and estimations will be spearheaded by him.
Hamdiyah Alhassan	Hamdiyah will play a key role in getting data in usable form, participate in econometric estimations and writing of report.
Benjamin Musah Abu	Benjamin will focus on the preparation of data in usable form to meet the objectives of the study. He will also play a major role in the setting up of econometric procedures and empirical estimations. He will be coordinating and reporting on design/implementation of the study policy engagement and communication strategy.
Yazidu Ustarz	Yazidu will lead the process of theoretical and empirical review of literature. He will also lead the process of presenting estimations in required format and discussion of results. The content of the resulting report will be championed by him.

Edinam Dope Setsoafia	Edinam will participate in organising and preparing data for analysis, participating in data analysis, and assisting in review of empirical literature.
Shamsia Abdul-Wahab	Shamsia will participate in literature search and review, data preparation for analysis, and also be guided to understand the process of analysis.

**b. List of past, current or pending projects in related areas involving team members**

Name of funding institution, title of project, list of team members involved

<b>Name of funding institution</b>	<b>Title of project</b>	<b>Team members involved</b>
Oxfam, Ghana	Renewable energy services and poverty and income inequality reduction in Kpatua in the Garu-Tempene District of the Upper East Region of Ghana	Paul Kwame Nkegbe & Benjamin Musah Abu
Alliance for Green Revolution in Africa (AGRA)/International Initiative for Impact Evaluation (3ie)	An impact evaluation of inoculant usage on farmer yields and farm incomes in Ghana.	Paul Kwame Nkegbe, Yazidu Ustarz & Benjamin Abu Musah
UNU-WIDER	Evaluation of climate effects on household welfare indicators in northern Ghana. A study within UNU-WIDER's "Development under Climate Change" (DUCC) project in collaboration with the Institute of Statistical Social and Economic Research (ISSER), Ghana.	Paul Kwame Nkegbe

## **SECTION III – POLICY ENGAGEMENT**

### **3.1. Policy context and needs**

Describe the specific policy issues or needs that your research aims to address; how your potential outcomes and findings **may be used in policy making**? Please be as precise as possible, indicating specific current or prospective policies and the specific contributions your research would make.

Also, justify **timing** of your research in terms of policy and socioeconomic **needs** and **context** – e.g. reference to existing, planned or potential policies at the national, regional or local level; specific political context; international examples of similar policy problem or solution, etc.

As noted earlier, market participation has been identified as one of the growth poles of rural poor households. As a way of reducing rural poverty, and thus poverty among smallholder farmers, Ghana’s Food and Agriculture Development Policy (FASDEP II), sets out policy strategies to increase farmer participation in markets and thus commercializing agriculture (MoFA, 2007, 2009). Further, Ghana’s agriculture policy aims to promote non-farm employment as a way of diversifying incomes of the rural poor (MoFA, 2009), and ultimately impacting the farm sector positively.

However, evidence in support of these assertions is lacking. The outcome of the proposed study will thus help assess the achievement of these aims. The study will show whether engagement in non-farm employment complements the decision to sell, and whether it ultimately affects agricultural commercialization. This way, evidence-based recommendations will be advanced for targeted policy making.

### 3.2. Consultations to date

List all (past) consultations with potential research users (e.g. policy makers or stakeholders) that have helped define your research question, and/or informed you of the specific policy context described above. Include a list of names, institutions and email addresses (add rows when needed).

Name	Title	Institution	Email
Sagre Bambangi	Deputy Minister, Ministry of Food and Agriculture & MP	Ministry of Food & Agriculture, Ghana	sbambangi.yahoo.co.uk
Saa Dittoh	Professor and Consultant to MoFA on METASIP (previous and ongoing revision)	University for Development Studies, Tamale, Ghana	<a href="mailto:saaditt@gmail.com">saaditt@gmail.com</a>
Luabeya Franck Kapiamba	Country Programme Manager	International Fund for Agricultural Development	<a href="mailto:l.kapiamba@ifad.org">l.kapiamba@ifad.org</a>

### 3.3. Identify target audiences

Identify potential users of your research findings, including policy makers, advisors and other key stakeholders. Provide a list of institutions and, whenever possible, specific individuals to be targeted for effective policy influence. Please also indicate whether you have already made contacts within the institutions (add rows when needed).

Name	Title	Institution	Email
Dr. Sagre Bambangi	Deputy Minister, MoFA (contact made already)	Ministry of Food and Agriculture (MoFA)	sbambangi.yahoo.co.uk
Mr. Joseph Boamah	Ag. Chief Director	Ministry of Food	<a href="mailto:info@mofa.gov.gh">info@mofa.gov.gh</a>

	(contact made already)	and Agriculture (MoFA)	
Prof. Saa Dittoh	Consultant to MoFA on METASIP ongoing revision (contact made already)	University for Development Studies, Tamale, Ghana	<a href="mailto:saaditt@gmail.com">saaditt@gmail.com</a>
Dr. Nii Moi Thompson	Director-General (yet to be contacted)	National Development Planning Commission	<a href="mailto:info@ndpc.gov.gh">info@ndpc.gov.gh</a>
Prof. Seidu Al-hassan	Commissioner (yet to be contacted)	National Development Planning Commission	<a href="mailto:zodaseidu@yahoo.com">zodaseidu@yahoo.com</a>

### 3.4. Define outreach and engagement strategy

How, from proposal design to the dissemination of your research results, will you consult and communicate with these users to both gather their inputs and keep them informed of your project, in order to increase chances of research uptake? You can refer to [PEP requirements in terms of policy engagement and research communication](#) to have a better idea of what is expected in terms of grantees' initiatives in this area

They will be written to occasionally and also periodic meetings scheduled with them for the purpose of briefing them on progress of work and soliciting their inputs. We intend to hold three stakeholder meetings (at the beginning of the study, soon after first draft and just before final draft) for the purpose of keeping them abreast of findings of the study and enhancing possible uptake. We are in constant touch with Prof. Saa Dittoh who has consulted for the Ministry of Food and Agriculture for the purpose of reviewing and updating the Medium Term Agriculture Sector Investment Plan. He has been very instrumental in providing insight on areas of concern to the Ministry.

### 3.5. Outline your preliminary dissemination strategy

Identify potential and relevant communication channels (e.g. direct stakeholder meetings, conferences, media/press, web platforms, etc.) through which you will be able, or attempt, to communicate and disseminate your research and research findings.

Name	Title	Institution	Email

Outline your preliminary dissemination strategy. Note that PEP expects grantees to disseminate information about their research work and (expected) outcomes throughout the project cycle, and not only after publication.

We intend to disseminate the results of the study using multiplicity of channels. We will disseminate our results to officials of three ministries and a commission. These are the Ministry of Food and Agriculture, the Ministry of Employment and Labour Relations, Ministry of Trade and Industry and the National Development Planning Commission. The Ministry of Food and Agriculture is seen as the main government machinery to make use of the outcome of our study, especially because they are now implementing the Medium Term Agriculture Sector Investment Plan II (METASIP II). The results will also be very useful to the National Development Planning Commission (NDPC) as they are also putting together a Forty-Year Development Plan for all sectors in the Ghanaian economy. We will seek the audience of the commissioners of the NDPC at some point in time.

We would organise our own national policy conference at which the stakeholders will be invited. We would also take advantage of other national policy conferences, consultations and seminars organised by the government to disseminate our results to government functionaries, policy makers and the general public. This way, we will solicit their inputs in the form of views and opinions and also keep them informed of the results of our study to enhance the chances of such results informing government policy. Briefs will be produced for the purpose of such meetings.

The University for Development Studies also organises a national Annual Interdisciplinary Conference through its Institute for Interdisciplinary Research and Consultancy Services (IIRaCS), and we hope to use that avenue to inform the University Community and the general public of the outcome of our study. We also intend to keep faculty informed of our study through participation and presentation of reports on preliminary results at regular monthly seminars so we can get their inputs and comments.

Finally, we will seek opportunities to present the results in conferences both at home and abroad. These avenues will include PEP Meetings and Workshops, Annual Conferences of the Royal Economic Society (RES) and the African Association of Agricultural Economists (AAAE), International Association of Agricultural Economists (IAAE) Triennial Conference or Inter-conference Symposium, or at the European Association of Agricultural Economists (EAAE) Congress or Annual Symposium. Besides getting the research report published at the PEP website, we will endeavour to publish the results of the study in renowned journals.

## SECTION IV – OTHER CONSIDERATIONS

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

We intend to use secondary data and do not envisage any such issues or risks.

## 4.2. References and plagiarism:

Applicants should be very careful to avoid any appearance of plagiarism. Any text of three 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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