SPILLOVERS FROM SELF-EMPLOYMENT OPPORTUNITIES IN RURAL NIGER

RESEARCH PROPOSAL

Presented to

Partnership for Economic Policy (PEP)

By

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SECTION A – For all projects

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 data that will be used.

We examine whether increasing self-employment opportunities for rural households benefit or not the smallholder farm sector through investment linkages in Niger. Off-farm activities are viewed as an important source of cash income, which can potentially improve farm productivity if it is used for farm input purchase. There is the argument that, negative externalities might however result from the expansion of off-farm activities through the existence of factors that are share across farm and off-farm activities. We first examine factors that determine farm households' decisions to involve into self-employment activities and then analyse the impact of that decision on farm households' agricultural production, on agricultural inputs used and on food security. Many studies in a similar context as in Niger have stressed the importance of understanding the constraints face by the rural non-farm sector and its implications. Yet in Niger there is little knowledge if not any on the determinant of low-skilled off-farm employment and the nature of the linkage between the farm and the non-farm sector resulting from the increasing of such non-earned work. We use the data from the Enquête Nationale sur les Conditions de Vie des Ménages et l'Agriculture de 2011(ECVM/A-2011), available online in the World Bank site. The ECVM/A is implemented by the Niger Institut National de la Statistique (INS) and is nationally representative. We make use of the endogenous switching regression model (ES) accounting for the argument of technical interdependencies or jointness between on- and off-farm activities, and for the potential endogeneity of self-employment involvement.

2. Main research questions and contributions

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

2.1. 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?

In Niger 90% of the population live in the rural area and depend on agriculture. Farm households face constraint in terms of agricultural factors that may hinder agricultural production and threaten food security. In 2005, Niger coped with a food crisis that hit more than 1.5 million of persons including 800000 children. A study of the Mondial Food Program reports that 47.7% of the

population was affected by food insecurity in 2010 (ALI, 2011). One of the causes of vulnerability put forward is generally the lack of diversification of revenues of farm households and their concentration on agricultural production. A potential alternative in risk management strategies of a large numbers of rural households is thus their involvement in the rural non-farm economy. As an important route out of poverty, there is a new interest in promoting the development of the rural non-farm economy as a source of growth in agricultural-based countries (IFAD, 2011). Indeed the policy attention regarding development issues is usually distributed evenly between rural and urban areas in many development countries. The employment policy receives more attention in urban zones while agricultural policy focusing on farm incomes is mainly a concern in the rural area (Ruben and Van den Berg, 2001).

Non-farm sector is perceived as having a potential in absorbing a growing rural labor force, in slowing rural–urban migration, in contributing to national income growth, and in promoting a more equitable distribution of income (Lanjouw and Lanjouw, 2001). However there is uncertainty on what policies to be introduced to make non-farm income opportunities available for broad removal of rural poverty (Holden et al., 2004). As rural households become more diversified by involving in the non-farm sector, market imperfections may cause interdependencies between farm and off-farm activities and may lead to spillovers effect. According to the literature on the linkage between farm and off-farm activities, labour market imperfections may cause the linkages to be negative while credit market imperfections may lead them to be positive. In this case, policy implications in rural area derived from models that consider farm and off farm decisions as independent may be misleading.

In this study, we ask whether and how spillover effect result from self-employment opportunities in rural Niger. Off-farm activities are viewed as an important source of cash income, which can potentially improve farm productivity if it is used for farm input purchase or longer-term capital investments purposes (Reardon et al., 1994). Some studies focusing on the linkages between farm and off-farm activities find that off-farm income contributes to alleviate capital and credit constraint providing the necessary cash for farm expenses (Haggblade et al., 1989; Davis et al., 2002; Maertens, 2009; Asfaw et al., 2011). For example evidence from developing countries show that off-farm income affects the adoption of an expensive package of animal traction equipment (Savadogo et al., 1994) and contributes to higher input used (Oseni and Winters, 2009; Anriquez and Daidone, 2010;

Stampini and Davis, 2008; Ruben and Van Der Berg, 2001) that enables farmer to improve yield and productivity (Woldehanna, 2000). Also Income earned off the farm might not be used for agricultural production, but rather, to increase consumption, finance investments in non-agricultural production or education, or migrate out of the rural sector entirely (Pfeiffer et al., 2009).

There is also the argument that, negative externalities might however result from the expansion of off-farm activities through the existence of factors that are share across farm and off-farm activities (Ravallion, 2003). Family labor allocation between farm and off-farm activities is one example highlighted in the literature. For example it is argued that increasing off-farm employment opportunities may contribute to labor transfers out of farming and to a reduction in the time available for farm management (McNally, 2002; Gedikoglu et al., 2011). This might lead to a reduction of the adoption of time-intensive farming techniques (Phimister and Roberts, 2006), farming inefficiency (Goodwin and Mishra, 2004) and farm production and productivity loss (Low, 1981).

Our research objectives in this study are double: (a) we first examine factors that determine farm households' decisions to involve into self-employment activities and (b) We then analyse the impact of that decision on farm households' agricultural production, on agricultural inputs used and on food security. Many studies (see above) in a similar context as in Niger have stressed the importance of understanding the constraints face by the rural non-farm sector and its implications. Yet there is little knowledge if not any on the determinant of low-skilled off-farm employment and the nature of the linkage between the farm and the non-farm sector resulting from the increasing of such non-earned work.

The issue of the relation between the farm and the non-farm sector in rural Niger is of interest in the context of unemployment, lack of resources, low agricultural productivity, high population growth and food insecurity. A report from the world Bank on Niger shows that 50% of the population suffers from some form of food insecurity; that two thirds of daily caloric consumption comes from cereal production and that safety net programs are small and receive limited government funding (WB Report, 2009). Also the National Employment Promotion Agency shows that unemployed people still struggle to integrate the labor market and attribute reasons for unemployment to the absence of good linkage between the labor market, vocational training, and policy to support entrepreneurship (IMF Country Report, 2013). The low-skilled off-farm self-employment continues to be the most accessible off-farm opportunities to households in rural Niger. In our case study, more than 92% of

rural households are involved in non-salaried employment and this is more likely in the future as a result of the rural farm household's livelihoods strategy to diversify their income.

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2.2. Describe the specific policy issues/needs that your research aims to address; how your potential outcomes/findings may be used in policy making?

- Justify timing of your research in terms of policy and socioeconomic needs/context – e.g. reference to existing/planned/potential policies at the national level.
- Evidence of previous consultation with potential users (e.g. policymakers and key stakeholders) to help define your research question is strongly encouraged. Include a list of names, institutions and email addresses when possible.

Agriculture is potentially a sector that draws more attention in many developing countries and particularly in rural areas where poverty is more pronounced. For the policy perspective, it is unlikely to increase agricultural growth and incomes of farmers without make them access to adequate resources. An improvement of farmers' performance might induce high agricultural production and contribute to alleviate food insecurity and poverty through consumption and revenue gain. It has been argued that policies and programs that improve access to credit would in turn lead to more efficient allocation of resources and increased production. Such policies must be designed to ease the market imperfections (Fletschner, 2008).

Related to this, the proposed research is pertinent in the Niger case. First, Niger is characterized by a context of scarce resources, imperfect factors markets and food insecurity. A recent report from IMF (2013) shows that Nigerien agriculture is basically subsistence-level food farming dominated by rainfed production of grains. Faced with accelerated desertification, degraded land and water resources, illegal felling of trees, climate change, and their adverse effects on the environment, the

country's response capacity is generally weak.

Second, according to the National Employment Promotion Agency (ANPE), unemployment among rural young people is associated with the shortage of gainful employment and the effect of food crises that force them to migrate to urban centers, where they face a precarious situation. The shortage of decent work due to the predominance of informal employment, particularly in rural areas and in the agricultural sector, among others limits the ability to improve living standards and create a climate of social peace. The reasons for unemployment and precarious employment are associated in particular with the absence of good linkage between the labor market, vocational training, and policy to support entrepreneurship. The IMF report (2013) emphasizes that in terms of the constraints identified, the principal challenge associated with promoting employment and decent work will be to successfully develop comparative advantages in order to create jobs in the sectors that drive economic growth (such as agriculture), while encouraging entrepreneurship.

As such, the way to enhance agricultural production and improve food security while at the same time increase employment is still an important policy question in rural Niger. Our proposal seeks whether there is not a conflicting objective in rural agricultural areas where interdependencies between farm and off farm activities are most likely. There is a lack of formal and decent wage employment in the rural zone resulting to rural exodus, mainly for young people. However low skilled self-employment is evolving and the main challenges for policy interventions is to promote this type of off-farm employment without threatening agricultural production.

Our research will provide more understanding on the causes (objective 1) and consequences (objective 2) of off-farm self-employment in rural area to inform policy actors. They may be interested for example to know the nature of the interdependency between the farm and the non-farm sector in the rural zone, i.e. whether the promotion of off-farm self-employment results in less (more) productive and efficient use of farm resources and decreases (increase) food security. This information could be exploited to develop complementary employment programs related to safety net programs by stimulating factors that contribute to a positive linkage between the farm and the non-farm sector and removing constraints to self-employment opportunities that hinder the development of such linkage. This would be a strategy to improve livelihood and food security for rural households in Niger.

Our research is somewhat in line with the 3N Initiative, "Nigeriens Nourishing Nigeriens.", as the general guidelines on food security and sustainable agricultural development are provided by this Initiative. The objective of the 3N Initiative is to "strengthen the national capacity for food production, a steady supply chain, and resilience in the face of food crises and natural disasters." This initiative focuses on creating conditions conducive to dealing with all risks to food and nutrition security, especially in a situation of strong population growth, and to ensuring that the agricultural sector is the vehicle for social transformation and economic growth (IMF, 2013).

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 consider one treatment variable and three outcomes variables according to the research objectives. The treatment (binary) variable is the decision of a household to work off farm, namely household involvement in self-employment activities. Outcomes variables are either the value of agricultural production, input demand, i.e. the demand for family labor and purchased inputs - hired labor, fertilizers, pesticides, and machinery – and food security.

We make use of the endogenous switching regression model (ES) in order to estimate factors influencing household decision to participate in off-farm self-employment (objective 1) and the differential impact of this decision on agricultural activities and on food security (objective 2). The ES model has been recently used in a similar context of farm household decisions such as adaptation to climate change and adoption to new crop in Ethiopia (Negash and Swinnen, 2012, Di Falco et al., 2011), under technology adoption decisions in northern Nigeria (ALene and Manyong, 2007) or Participation in supermarket channels in Kenya (Rao and Qaim, 2011).

In our case study of Niger, we adapt the specification in Lokshin and Sajaia (2004) accounting for the argument of technical interdependencies or jointness between on- and off-farm activities that is specific to many developing countries. We consider that off-farm self-employment decision and agricultural decisions - such as the intensity of agricultural input use - are made simultaneously.

Household off-farm decisions are modelled as follows :

$$D_i^* = Z_i'\alpha + u_i \qquad (1)$$

$$\text{With } D_i = \begin{cases} 1 & \text{if } D_i^* > 0 \\ 0 & \text{otherwise} \end{cases} \qquad (2)$$

D_i is the observed binary variable of whether the household i is involved in off-farm self-employment activities. The equation (1) implies that a household participates in off-farm activities under the condition that the difference –the latent variable D_i^* - between the marginal net benefits of involving in self-employment activities and not involving in these activities is positive(see ALene and Manyong, 2007).

As regards to outcome variables, households face two regimes :

$$\text{Regime 1: } Y_{1i} = X_i'\beta_1 + \varepsilon_{i1} \text{ if } D_i = 1 \qquad (3)$$

$$\text{Regime 2: } Y_{2i} = X_i'\beta_2 + \varepsilon_{i2} \text{ if } D_i = 0 \qquad (4)$$

Where Y_i is one of the outcomes variables as defined above, in the different regimes.

The estimation of the ES model - equations (1) to (4) - is subject to an endogeneity problem. The participation in off-farm activities is likely to be non-random. For example, some unobserved household characteristics such as entrepreneurial ability can influence both agricultural decisions and off-farm activities (Pfeiffer et al., 2009). More motivated households might also combine farm and off-farm activities while more constrained households might decide to engage more in off-farm activities such as self-employment. In such cases, the estimated coefficients may be biased and inconsistent in standard regression models if unobserved factors in the error terms ε_i are correlated with those affecting the involvement (of self-employment) process.

In order to correct for or at least reduce the bias from the potential endogeneity of self-employment involvement, the ES model is estimated simultaneously by full information maximum likelihood (FIML) method (Lokshin and Sajaia, 2004). In the selection (probit) equation (1) and the outcome equations (3 and 4), the vectors Zi and Xi include observable covariates that might affect household decision making, namely factors that influence the relative return and risk of agricultural production and factors that determine the capacity to participate in non-farm activities (de Janvry et al., 2005; Oseni Winters, 2009; Ruben and Van Den Berg, 2001). These variables are human capital endowments such as age

and education of the household head (or the average number of years of schooling of household members and its square term), social capital such as the membership of an organization, or idiosyncratic factors such as the gender of the household head and the ethnicity of the household. To control for relative labor endowments or labor allocation among family members, we also include the ratio of female adults to male adults and the dependency ratio of children to adults. Agricultural landholdings and whether the household uses an irrigation system and household non-agricultural wealth index are additional factors controlling for household access to resources. Dummies for regional or agro ecological zones are also included in Xi to account for environmental or geographic conditions.

Although no exclusion restrictions are needed to identify the switch model, Zi include most of variables which do not belong to Xi to make the estimates more robust. In the ES model, endogeneity (that can be tested) is modelled through the correlation between the error terms ε_i and u_i that are assumed to have a trivariate normal distribution, with a mean vector zero and a covariance matrix.

The estimation of the parameter α allows answering the first research question. The differential impact of participating in self-employment on the outcomes variables (second research question) is calculated through the parameters β. With the ES model, we follow (Di Falco et al., 2011) and calculate using the expected outcomes :

(a) the effect of the treatment on the treated (TT) i.e. the effect of self-employment involvement on outcomes variables of the households that actually involve in this off-farm activity: E(Y1i|Di =1) − E(Y2i|Di =1);

(b) the effect of the treatment on the untreated (TU) for the households that actually did not involve in self-employment activities: E(Y1i|Di =0) − E(Y2i|Di =0);

(c) the effect of base heterogeneity" for the group of households that decided to involve in off-farm activity. This account for the differential impact in outcomes for the two groups of households regardless of the fact that they decided to involve but because of unobservable characteristics: BHj =E(Yji|Di =1) − E(Yji|Di =0), j=1,2;

(d) the "transitional heterogeneity" (TH), that is whether the effect of involvement is larger or smaller for households that actually involved in off-farm activity or for households that actually did not

involve in the counterfactual case that they did involve: TT - TU.

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. Please consult the "**Guide for designing a research project proposals**" for more detail.

We use the data from the Enquête Nationale sur les Conditions de Vie des Ménages et l'Agriculture de 2011(ECVM/A-2011), available online for downloading free of charge in the World Bank site. The ECVM/A is implemented by the Niger Institut National de la Statistique (INS). The sample includes approximately 4,000 households and is nationally representative. The sample is also representative of three ecological zones - agricultural zones, agro-pastoral zones, and pastoral zones. The survey includes three instruments: the household questionnaire, the agriculture questionnaire and the community questionnaire.

For the purpose of our analysis we restrict the sample to the rural area (N=2430). Households are smallholder farmers and hence derive their income from agricultural activities. Households seem also to complement their income with revenues from off-farm activities. They differentiated into diverse off-farm activities such as wage and non-wage labor with more than 92% into the latter. One or several households have members involved either in salaried, non-salaried work or both types of off-farm employment. As such we restrict further our analysis to a sample of households that involved only and only to off-farm self-employment (the treatment sample) and those that did not involve in any kind of off-farm employment (the reference sample). This leads to a total sample of 1077 households with 69.55% of households involving in off-farm self-employment.

Data on demographic characteristics and on different types of activities that allow calculating household farm expenses and food security were also collected. These are information on household expenses for farm inputs including expenses for seeds, chemicals, fertilizers, irrigation water and fuel, household expenses for hired farm labor and consumption expenditures.

5. Policy influence plan (or research communication strategy)

- Identify potential users of your research findings, including policymakers 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 institution
- How, in the elaboration and execution of your project (from design to dissemination), will you consult/communicate with these users to both gather their inputs and keep them informed of your project (expected contributions and uses), in order to increase chances of your findings to be taken-up into policymaking?

You can refer to **PEP's research communications strategy and guidance** to have a better idea of what is expected in terms of activities for policy outreach and dissemination.

Institution	Contact	Target
Agence de Régulation du secteur de la Microfinance	TEL : 20 35 04 92 / 93 - FAX : 20 35 04 89	Director
Ministère de l'agriculture		Ministry
Ministère de l'Emploi, du Travail et de la Sécurité Sociale		Ministry
Institut National de la Statistique	82, Rue de la SIRBA BP 13416 Niamey- Niger , Tel: +227- 20 72 35 60	Director
Université Abou Moumouni Niamey	BP10586 Niamey - Niger Tél / fax: (00227) 96 25 59 52 21792201	Researchers
Aide-Action-Développement	Tél. : +22721769145/ +22796886508	President
Care International' Niger	Avenue des Djermakoye BP. 10105 Tél. : +22720740213	The coordonnateur
Genre et Développement Rural	BP. 10135 Niamey, Niger Tél.: +22720724809/ +22720736775	President
'Switzerland Niger'	BP. 2892 Niamey, Niger	Programme Agent

	Tél.: +22796972008	
Initiatives Locales d'Actions en faveur des Femmes	BP. 13246 Niamey, Niger Tél.: +22721766495/ +22796482519	The coordonnateur
Association des Femmes pour la Promotion de l'Elevage au Niger	BP. 6 Niamey, Niger Tél.: +22720722625	President
Institut de recherche pour le Développement (IRD)	276 avenue Maradi BP 11416 Niamey Niger Tel : (227) 20 75 31 15 / 26 10 - (227) 20 75 25 30	Representant
LASDEL (Laboratoire d'Etudes et de Recherche sur les Dynamiques Sociales et le Développement Local)	BP : 12901 Niamey Niger rue du Plateau, à côté de la direction de la Nigelec, Tél : (227)20723780	Researchers
RECA, Réseau National des Chambres d'Agriculture du Niger	Quartier Plateau - Niamey BP 686 Niamey Tel : (+227) 21 76 72 94	Director

Policy actors will be consulted during all stages of the research. First At the beginning of the research, contacts will be made with important policy actors to inform about the research objective and discussions. During the data analysis we will also work in collaboration with the Niger Institut National de la Statistique (INS). This would help to manage correctly data as results will depend on the way the data will analyze. We will organize a seminar with policy actors to discuss about the preliminary results. Final results will be discussed with policy actors again during a seminar. A final workshop is planned to share the final report with a large audience (media, researchers, policy actors). The presentation of the research in several conferences, workshops, the publication of the research in peer review journals and some policy briefs are also expected.

6. List of team members

Indicating their age (or whether they are under 30), sex, as well as relevant/prior training and experience in the issues and research techniques involved (start with lead researcher).

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** 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
Sènakpon F. A. Dedehouanou	More than 30	M	PhD in Development Economics obtained at KU Leuven, Belgium. He is lecturer and researcher at the Faculty of Business and Economics, University of Abomey Calavi in Benin. He has been involved in several research projects on agri food supply chains in rural Senegal (and led some of them). He has already published several papers in his short career. For his research he focused on micro-economic issues of development, but he was always very interested in macro-economic issues as well. He has strong quantitative skills and he has a thorough understanding of econometric techniques. He is a researcher network member of institutions such as the Economic Research Consortium (AERC), The Global Development (GDN) and the Partnership for African Social and Governance Research (PASGR), and has undertaken several studies with these institutions. He has presented research works in several international conferences.
Aichatou Ousseini	More than 30	F	The researcher holds a Doctorat in Economics from Université de Cocody-Abidjan (Côte d'Ivoire). She participated on Economics policy course, Scientific writing, data analysis, Modelling. She also teach economics courses.
Adamou Soumana Halimatou Saadia	26	F	She is currently a master student in rural economy and agricultural policy in Université Cheikh Anta Diop. She holds an advanced master in microfinance.
Laouali Harouna	26	M	He holds an advanced master in statistics and

Abdoulaziz			econometrics and also in policy negotiation of internal trade. He has an experience on survey, data cleaning and data analysis.

7. Expected capacity building

Description of 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 in some 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? Also indicate which specific tasks each team member would carry out in executing the project.

Name	Task
Sènakpon F. A. Dedehouanou	In this project, he will be in charge of data collection, data cleaning and data analysis. He will focus also on the literature review and the policy implication from the results. This project will help him to develop more skills in policy engagement and leading research.
Aichatou Ousseini	The researcher will contribute in the analysis of results and the report writing. She will also help in contacting policy actors and organizing meetings with them. This project will help her to improve her skills in Research Methods, policy brief Writing, and to reinforce her capacity in policy engagement.
Adamou Soumana Halimatou Saadia	Literature review and results analysis. This project will help her to improve her skills in Research Methods, Proposal Writing and Structure Policy engagement
Laouali Harouna Abdoulaziz	He will be in charge of data cleaning and data analysis. The project will help him to enhance his capacities in micro econometric analysis and in written and presentation skills for example.

8. 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

Name of funding institution	Title of project	Team members involved
Centre for Institutions and economic performance (LICOS), KU Leuven	High-Value Supply Chains, Food Standards and Rural Households in Senegal	Sènakpon F. A. Dedehouanou
Partnership for African Social	The Role of Governance in	Sènakpon F. A. Dedehouanou

and Governance Research (PASGR)	Explaining Performance of Non-State Social Protection Services in Senegal	
African Economic Research Consortium (AERC)	Institutional Arrangements and Education Service Delivery in Primary Schools in Mali	Sènakpon F. A. Dedehouanou
African Economic Research Consortium (AERC)	Are high-value agri-food supply chains participants better insulated from shocks? Evidence from Senegal	Sènakpon F. A. Dedehouanou
African Economic Research Consortium (AERC)	Asymmetric Shocks and Adjustment in West African Monetary Union	Sènakpon F. A. Dedehouanou
The Global Development (GDN)	Effect of Governance on Public Service Delivery in the Water Sectors in Senegal	Sènakpon F. A. Dedehouanou

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