Farm transformation process of the groundnut basin and perceptions of farmers linked to the climate change issue

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Abstract
Family farms of groundnut basin bear the brunt of the effects of climate change and experience severe mutations face changes in their social, cultural and technical. Agriculture, main activity, has less and less importance due to the deterioration of the means of production. In response, it is imperative to identify the constraints and risks affecting farms. Farmers have focused on structural constraints such as lack of inputs and farm equipment and climatic hazards with insufficient rainfall. The analysis of the forms of risk shows that there is a large spatial and temporal variability of rainfall with different drought that ended up impacting negatively on farming activities. These incidences have increased the vulnerability of farms in addition to the low level of adoption of technology, and the low level of market integration. The indicators related to the means and factors of production are behind the vulnerability of farms.

1. Introduction

Family farming is linked indissociably to the national and global food security. In developing countries as in developed countries, it is the main form of agriculture in the food production sector (FAO, 2014). It corresponds to a form of production that is characterized by the particular structural link between economic activities and family structure. It sustains 2.6 billion people and provides work for 40% of the global workforce (Agropolis International, 2014). It ensures at least 56% of agricultural production (FAO, 2014). In sub-Saharan Africa, most of the farms are family (nearly 80%) and the sector employs nearly 75% of the workforce (www.repaoc.org).

Family farms of groundnut basin bear the brunt of the effects of climate change and experience severe mutations face changes in their social, cultural and technical. Agriculture, main activity, has less and less importance due to the deterioration of the means of production. In response, it is imperative to identify the constraints and risks affecting farms. The risks (natural, agricultural, economic) are felt most acutely accentuating vulnerability. Understanding vulnerability, conceptualized through the exposure, sensitivity and adaptive capacity is therefore essential to study the potential effects of risks

2. Methodology

The complexity and heterogeneity of the targeted family farms and the extent of the study area has led us to adopt a sampling method known as "multi-stage". The first step is the identification of the study areas with a reasoned choice based on the acquired various projects involved in the field. The second step is a reasoned choice on representative villages in these areas. The last stage involves the random selection of family farms in the selected villages. For the Basin area, we selected 200 family farms (100 per zone). Several questionnaires on sociodemographic and

structural data, on the risks were administered to farms. For the typology, we took only the area surface as a discriminatory criterion. We divided our sample according to the typology proposed by the last global census of population, housing, agriculture and livestock (RGPHAE, 2013),

Quantitative vulnerability assessment is performed by the development of a "vulnerability index" resulting from different types of vulnerability indicators related to farming. These indicators are variables (quantitative or qualitative) that must reflect the exposure, sensitivity and adaptive capacity of the farms face risks, To standardize these indicators, we used the Human Development Index (HDI) of the UNDP (ICRISAT, 2009) that allows us to get free data units so that all values are between 0 and 1.

3. Results and conclusions

The analysis of the forms of risk shows that there is a large spatial and temporal variability of rainfall with different drought that ended up impacting negatively on farming activities. Farmers have focused on structural constraints such as lack of inputs and farm equipment before emphasis on the climatic conditions with insufficient rainfall (table1). These risks have very different implications through time and spatially but also on socio-economic factors in the different types of farms. For exposure, the variables taken into account are the rainfall and temperature. The main activities (agriculture and livestock) are not viable without the presence of water and are highly impact by temperature due to existing production systems in the Basin, For sensitivity, we have focused on the key factors of production are land, labor, inputs and farm equipment's, Most of these variables have relatively important clues showing their role in farm vulnerability, For adaptive capacity, variables concerned the provisions of farms in relation to markets, education, income, relationships with organizational and financial institutions. These indicators allow us to appreciate the dynamism among farm members and the sources of income or financing.

The vulnerability index at farm level is relatively high (0.66). The indicators related to adaptive capacity and sensitivity are the most important. These incidences have increased the vulnerability of farms in addition to the low level of adoption of technology, and the low level of market integration. The indicators related to the means and factors of production are behind the vulnerability of farms. Thus, it is in the understanding of these issues that we can find the political options for securing livelihoods in order to establish a sustainable production and living environment.

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