

## Econometric modeling of farm household land allocation in the municipality of Banikoara in Northern Benin

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### ABSTRACT

This article aims at understanding the driving forces that determine the decision making on land allocation within the West African farms, giving evidence of farms in the Municipality of Banikoara in Northern Benin. Using a semi-structured one-on-one questionnaire, primary data were collected from a sample of 210 farmers randomly selected in two villages. Agricultural lands are mainly allocated among cereal, legume and cash crops. The seemingly unrelated regression of land allocated among these three categories of crops revealed that socio-economic and demographic characteristics, institutional arrangements on land and access to production factors (labor and capital for instance) explained 33–58% of the variations observed in land allocation. The findings highlight at different levels of significance – 1%, 5%, and 10% – that the main determinants of land allocation are the location (village), the household head characteristics (sex, off-farm income activities, group membership, farming experience), the household size, the number of household's members working in agriculture, the agricultural wage labor use, the household's capital, and the access to credit. Compared to cereal and legume crops, land allocated to cash crops is determined by access to credit in addition to household's capital. Consequently agricultural policy has to focus on enhancing household's capital. This could be done by facilitating the access to credit. In line with this, requirements and conditions for accessing credit should be reviewed. Moreover, support and advice from extension service needs to be enhanced in order to improve farmers' skills.

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### Introduction

In many developing countries, agriculture is the dominant form of land management (Dale and Polasky, 2007). Globally, 38% of lands are in agricultural uses (FAO, 2004), and excluding boreal lands, desert, rock and ice, this amount rises to 50% (Tilman et al., 2001). However different problems are compromising its development and its capability to feed the growing world population. Consequently food security became an issue of great and growing concern in many countries, particularly in Africa (Kokoye et al., in press). The failure of agriculture to provide food and secure livelihoods is considered as a major factor contributing to rural poverty

(Chileshe, 2005). Climate change, deforestation, decline of soil fertility and unsustainable land management are cited as some of the causes of this situation.

In Benin, a West African country, agriculture is still based mainly on traditional farming systems – shifting cultivation for instance – in which subsistence with low capital inputs, like traditional tools and little use of fertilizers or irrigation is predominant (Igué et al., 2004; Mulindabigwi, 2006). The agricultural sector contributed to about 39% of GDP and employed about 80% of the population in 2002 (UNDP, 2003; Kokoye et al., in press). Cotton is the main cash crop in this sector and contributes to about 64% of export income, 90% of agricultural revenue and 24% of state revenue (OBEPAB, 2002; Kokoye et al., op.cit). However the country is among the poorest countries in the world with a per capita income of around 370 US\$ (UNDP, 2003). Moreover, more than 33% of households are unable to meet their minimum food needs despite the high prevalence of food expenditures (70%) regarding the global households' expenditures (PSRSA, 2010). As a result, the country faces huge food items importation. Actions toward the increase of agricultural production – food crops – and diversification of agriculture

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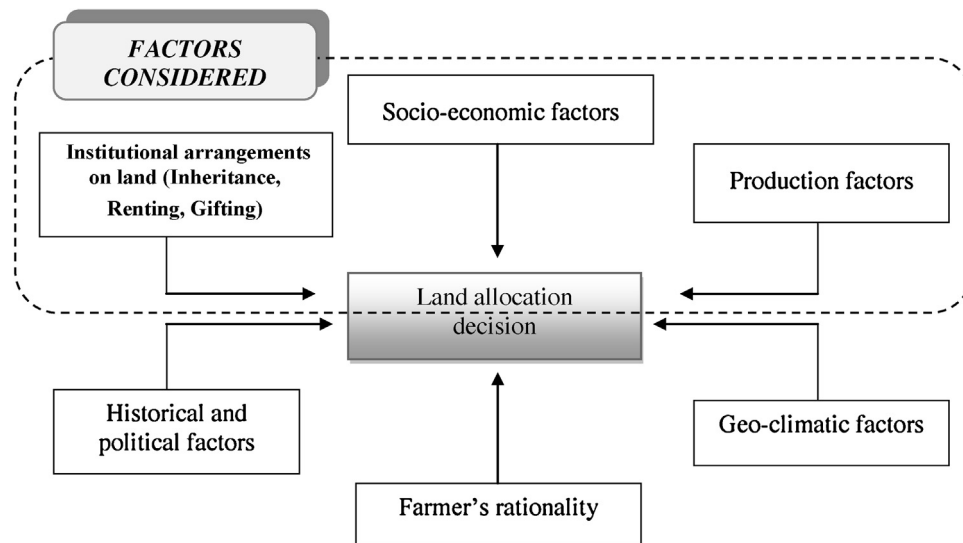


Fig. 1. Theoretical framework.

are among government policies taken to avoid this situation. In that case land management is a key element to focus on since the land use management appears to be a prerequisite for food security and sustainable livelihoods in developing countries. Efficient land utilization and management practices ensure achievement of farm level objectives in terms of economic viability, food security and risk aversion (Krusemen et al., 1996) and climate change mitigation. Therefore one of the most important issues to be decided on by farmers is: how to allocate the available land among a given numbers of crops. For this reason, the present study aims at understanding the driving forces that determine the land use choice. That is, it explores determinants of the decision making on land allocation within the Northern Benin Farms.

## Theoretical background

Agriculture land use is a cropping pattern which refers to land under net sown area, fallow land and uncultivable land excluded (Todkari et al., 2010). The land use choice is related to decision made by farmers regarding the actual use of land. Considering the neo classical model farmers are rational. They aim at reaching one or many objectives among which: ensure the food security of the households; ensure a cash income in order to satisfy the material needs; minimize the risk or ensure survival; maximize the leisure and related activities time; increase the household's patrimony in order to guarantee the survival during the old age and ensure the well being of family members; access to a certain social class in the community (Adégbidi, 1994).

One of the first production factors on which farmers have to decide on is the land. In this line, the land use design – way for splitting the total amount of land available – is one of the most important issues that farmers have to settle. According to Todkari et al. (2010), the land use decisions – allocation to different crops – are based on geo-climatic, socio-cultural, economic, historical and political factors. Moreover, farmer's appreciation of the available land resources, his responses to these resources as conditioned by the knowledge passed from generation to generation and his appreciation of demand for various agriculture commodities in the market may closely influence land use decision. Land tenure system is critical for rural households in their choice of livelihood activities and strategies (Quan, 1998; Amanor, 1999; Chileshe, 2005) including land allocation decisions.

From these theoretical backgrounds, three types of factors have been considered in the model. Those factors included the institutional arrangements on land, the socio-economic factors and the production factors (Fig. 1).

## Materials and methods

### Study area and data base

The Republic of Benin is located in tropical West Africa, between 6°30' and 12° North Parallels and 1° and 3°40' East Meridians. Data were collected in two villages belonging to the municipality of Banikoara (11°18'0" North and 2°25'60" East), situated in the Northern region of Benin (Fig. 2). The area is considered as the basket of food and cash crops, implying the major role of agriculture in the livelihoods of population in the study zone. This zone has been chosen because of its importance in agriculture in Benin and the problem it faced in term of land use between two categories of crops (food crops and cash crop here cotton).

A two stage sampling technique was used in selecting the respondents. The first stage was a purposeful sampling of two representative village – Kokiborou and Kokey – belonging to two different districts (out of eight districts in the whole municipality), selected with the support of agricultural extension officers following the criteria of the relevance of the subject for the village, the easiest accessibility during the survey time and the availability of financial resources. The second stage of sampling involved the random selection of farming households in the two villages. Therefore, primary data of this study were collected from a sample of 210 farmers randomly carried out after a rapid census of all farmers in the selected villages. In practice, in each village, all farmers were listed and a number was attributed to each of them. Later on, they were selected, using the table of random numbers. The sample size in each village is considered to be satisfactory as it covers at least 10% of the village households' size. Data were collected between July and August 2007 and are related to the farmers' socio-economic and demographic characteristics, access to land, and land allocation to crops during a cropping season 2006–2007. The data collection took place as a field study, using a semi-structured one-on-one questionnaire. The distribution of the respondents in the study area is presented in Table 1.

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