

## CONSTRAINTS ANALYSIS OF FAMILY AGRICULTURE IN KIRUNDO PROVINCE NORTHERN OF BURUNDI

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### Abstract

In Burundi, family agriculture occupies more than 90% of the active population. That sector accounts more than 50% of GDP. Before the civil war of 1993, Kirundo province was deemed "breadbasket of the country" because the family farming was market-oriented. Today, this region is the first province in Burundi who accuses a high rate of householders who live in food insecurity. In order to conduct this study, 355 randomly selected farmers were surveyed in all municipalities of the province. This preliminary study revealed that the farmers had as major constraints: the small and land conflicts. The study case had identified 73 farmers among them who had not farmland and/ or land conflicts as constraints of agricultural productivity. Two groups emerged: 42 farmers who were not able to fully exploit their land and another group of 32 farmers with a high agricultural productivity. Results from this study show that the major problems in the first group were: lack of applying soil protection techniques, illiteracy, lack of credit which leads farmers to contract moneylenders, lack of improved seed, etc. Moreover, the main strategy used by the second group to boost their income is the practice of non-agricultural activities which influences whole production system.

**Key words:** Family agriculture, rural economy, pluriactivity, Kirundo, Burundi

### Introduction

Cycles food shortages facing Africa have forced governments and donors to seek more effective strategies for rural and agricultural development. In Burundi, food prices have doubled or even tripled. For example, the price of rice increased from 600 BIF in 2005 to 1700 BIF in 2012; the price of beans was from 380 BIF in 2005 to 1200 BIF in 2012 (Paridaens et al., 2012). Increasing imports of foodstuffs to bridge the growing gap between demand and domestic production can not continue for a long term. Mellor and Johnston (1984) say that there is a broad consensus on the advantages of agricultural strategies that lead to progressive modernization of small farms in economies where 50 to 80% of the total populations depend on family agriculture. Agriculture and livestock play a vital role in any strategy to reduce poverty. Indeed, 90% of Burundi's population and 69% of the poor live and work in rural areas. In most areas, food production is insufficient to ensure the food security of rural populations and malnutrition rates are particularly high (IMF, 2010). In a very unstable as the prevailing climate in Burundi, the diversity of cultures is the guarantee of a minimum production to sustain the family (MINAGRIE, 2011).

Kirundo province before the civil war of 1993 was "the granary of the country" for the simple reason that region fed many parts of Burundi in particular food legumes (beans and peanuts) and grains (sorghum and maize), therefore a family farm was market-oriented and the number of people who live under poverty line was 28 % (UNDP, 1997). Moreover, food production of these crops are declined to 53,9% from 1996 to 2009 (ISTEEBU, 2010) and

83 % of people live under poverty line (IMF, 2010).

The objective of this study is to analyze main constraints of family farming and propose the main strategy for boosting rural economy.

## Materials and Methodology

### Area description

Kirundo is located in Northern Burundi. It is bordered at the North and West by the Republic of Rwanda and Ngozi Province, in the South and East by Muyinga province. Its area is 1,703.34 km<sup>2</sup>. This province accounts 626,355 inhabitants (MININTER, 2011) with population density equivalent to 368 inhabitants/ km<sup>2</sup> (figure 1). In terms of topography, the province has altitude which is between 1,500 and 2,000 m. and is characterized by temperatures between 14.8 and 27.1 ° C and average annual rainfall is between 800 and 1200 mm (URAM, 2007). The rural economy is based on the family farming oriented to the consumption (bananas, sweet potatoes, beans, sorghum, maize, cassava, etc) and livestock which is also traditional with local races such as: cows, goats, pigs, chickens, rabbits, etc.

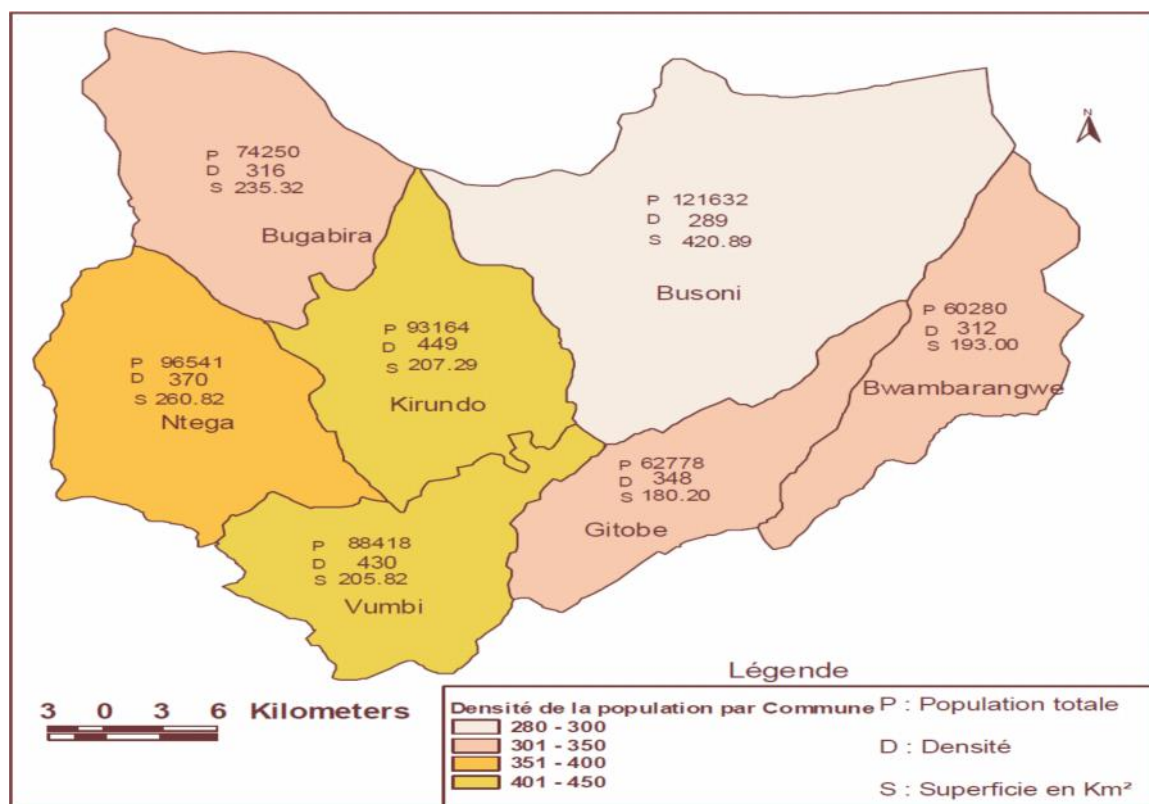


Figure 1. Demographic density in Kirundo province (UNDP, 2006)

### Methodology

To conduct this study, a first survey was carried out among 355 farmers who were randomly selected in seven communes of the province of Kirundo (Bugabira, Busoni, Bwambarangwe, Gitobe, Kirundo, Ntega and Vumbi) in 2010. The second survey was concerning the case study which has identified 73 farmers among the first survey (355 farmers) who had not a small farmland and land conflict as constraints of agricultural productivity. Two groups emerged: group of 42 farmers exploiting partially their land and another group of 32 farmers who gets a high agricultural productivity. Those farmers were followed during one year from 2011 to 2012. This second survey was completed by analysis secondary data from reports of the Government, Non Government Organisations, etc. To analyze our data, SPSS 16.0 and MINITAB 16.0 were used.

### Results and discussion

The results from the first study show that 54% of farmers have small land (<0.5 ha), 25% of farmers possess an area between 0.5-0.99 ha; therefore, we observe 21 % of farmers who possess than 1 ha of the land (tableau 1). The small farmland is a major constraint to increase agricultural production in that province of Kirundo. These results corroborate with those carried out by the IMF (2009) and (2010) which show that the depletion of land is a major handicap for the development of family farming in Burundi.

**Table 1. Size of farmland in Kirundo province (ha)**

Interval	Average of farmland in hectare by household (ha)	Number of farmers	Percent (%)
< 0,49 ha	0,235	191	54
0,5 -0,99 ha	0,678	89	25
1-2 ha	1,18	58	16
2,01- 5 ha	3,135	13	4
> 5 ha	10,48	4	1
Total/average	0,74	355	100

Source : Our Survey 2010

During the period from 2009 to 2012, the results show that land disputes are respectively 32% and 34% of pending cases (civil and criminal cases) the in court of residence of communes and the High Court of Kirundo. Considering only civil cases, this percentage rises up to 41% in the courts of residence and 70% in the high court (table 2). The land situation is currently in crisis due to the multiple consequences, including crisis characterized by the failure of the current system of land management. This crisis can be summarized in main points, namely: (i) the land issue is a central issue, especially since agriculture now accounts for over 90% of economic activity, (ii) land pressure is growing, leading to the fragmentation of cultivable land and exacerbating land disputes, and (iii) the procedures for registration and changes of land ownership before the Land Code 2011 were inadequate and could not cover the entire national territory (MEATT, 2008).

**Table 2. Land conflicts in Kirundo province**

Type of cases recorded from 2009 to 2010	Case registered from 2009 to 2012 on residence tribunal		Case registered from 2009 to 2012 on residence tribunal	
	Number (n)	(%)	Number (n)	(%)
Conflict cases	2 599	32	1 359	34
Familial cases	1 707	21	256	6
Other type of civil cases	2 008	25	340	8
Criminal cases	1 894	23	2 075	52
Total cases (criminal and civil cases)	8 208	100	4 030	100

Source: Our calculation from residence tribunal and high court data from 2009 to 2012

The impact of land conflicts is numerous: we note that 7 772.5 tons of bananas per year (22% of total banana production at provincial level) are lost because of land disputes. The banana is the main crop which provides much income to rural households. Farmers lose also a significant production estimated at 2.573,3 tones (17 % of total coffee cherries

production at Kirundo province level), main industrial crop for export which permits to farmers to get a lot of income to households and also currency for country. Sorghum provides significant income for farmers in the region. It can be used for the production of beer also for food consumption. That's why to lose 1168.9 tons of sorghum per year (6% of the total sorghum production at the provincial level) is enormous for poor farmers. The main crop in Kirundo region is bean which plays a main role for food and nutrition diet, and procures a lot of income to rural households. However, we observe 7 729.2 tons per year at the provincial level (25% of total bean production at provincial level) lost because of land disputes. Farmers lose also 667.7 tons of cassava per year (31% of total cassava production at the provincial level).

The results from the case study show that the level of education is higher among farmers with high agricultural productivity (6% only of head households are illiterate) than a group of farmers with exploiting partially their land (41% of head households are illiterate). It appears from these results that education level influences significantly the production system, and whole rural economy. Indeed, Lau et al. (1991) found that increasing 10% of education level generated 0.3% of additional economic growth in Sub-Saharan African countries, 1.7% in Latin America and 1.3% in East of Asia, Also the studies carried out by Orivel (2001) confirmed those findings, and showed that farmers who completed four years in primary school had 7.4% higher productivity than their counterparts who do not have attended primary school. Therefore, the increasing of human development capital can improve the technical and managerial practices of farmers and offered to them their chances of success (Gurgand, 2003; Barrett et al, 2001.).

Table 3. Main socio-economic parameters considered

Variables	Farmers with high agricultural productivity	Farmer with partial land exploited
Illiteracy rate (%)	6	41
Annual man-days per household	221	94
Users of mineral fertilizers	25	5
Tropical Animal Unit/ Household	1,38	0,98
Members of local associations (%)	58	32
Cereal-equivalent by active worker (kg)	728,78	304,84
Households with coffee fields (%)	44	19
Households who resort to moneylenders for credit	0	28
Farm income (thousands in BIF) by active work farm	621	234
Investment rate	14	9

Source: Our survey 2011-2012

The agricultural labor in the group of farmers exploiting partially their land is insufficient and is essentially family, the number of farm assets is low, reaching only 2.22 Agricultural assets per household. The number of man-days used annually is 94 man-days per household (71 man-days from family and 23 man-days employees), which gives an average of 8 man-days per month. With this number of man-days per month, it is almost impossible to plow large areas exceed 0.5 ha, that explains many fields abandoned by farmers without being plowed in that group, and therefore the low agricultural production observed in that group. Moreover, the group of farmers with high productivity uses a higher agricultural labor

work (235 man-days annually with 115 man-days employees and 120 man-days provided by family) which allows to these farmers to plow large areas and to achieve other activities related to environmental protection, non-agricultural activities, fertilization, integrated pests management, etc. The impact of that parameter is to increase labor quality, and therefore the agricultural production.

In the group of farmers exploiting partially their land, 5 % only of farmers fertilize their field lands because few farmers possess domestic animal (0.98 Tropical Animal Unit by household) to get organic fertilizer and other are poor to buy mineral fertilizers. Those factors combined with others explain why the low agricultural production obtained by those farmers. Furthermore, the group of farmers with high production gets a higher agricultural productivity because many farmers apply mineral and organic fertilizers in their cultivation lands because they have many domestic animals (1.38 Tropical Livestock Unit by household); they adhere to the local associations in which they follow much training in agriculture, livestock and finance sectors. We observe also 28% of households among farmers exploiting partially their land resort to moneylenders for getting agricultural credit. These moneylenders ask to them a higher interest rate for repayment. Contrariwise, none of member in the group of farmers with high agricultural productivity resorts to moneylenders because their local associations endorse them for accessing to the agricultural credit. Many of farmers among the group with high productivity have coffee fields (44 %) which permit to them getting much income while 19 % only of farmers exploiting partially their lands possess coffee plantations. The group of farmers exploiting partially their land consecrates low percent for investment 9 % while other group allocates 14 % of family income. So, the group of farmers with high productivity gets 728,78 kg of cereal-equivalent and 621 thousands Burundi francs (BIF) by active work farm which are very higher than the agricultural productivity obtained by farmers exploiting partially their land with 304, 84 kg cereal-equivalent and 304 thousands Burundi francs by active work farm. The explanation for that difference within two groups of farmers in production system is given above.

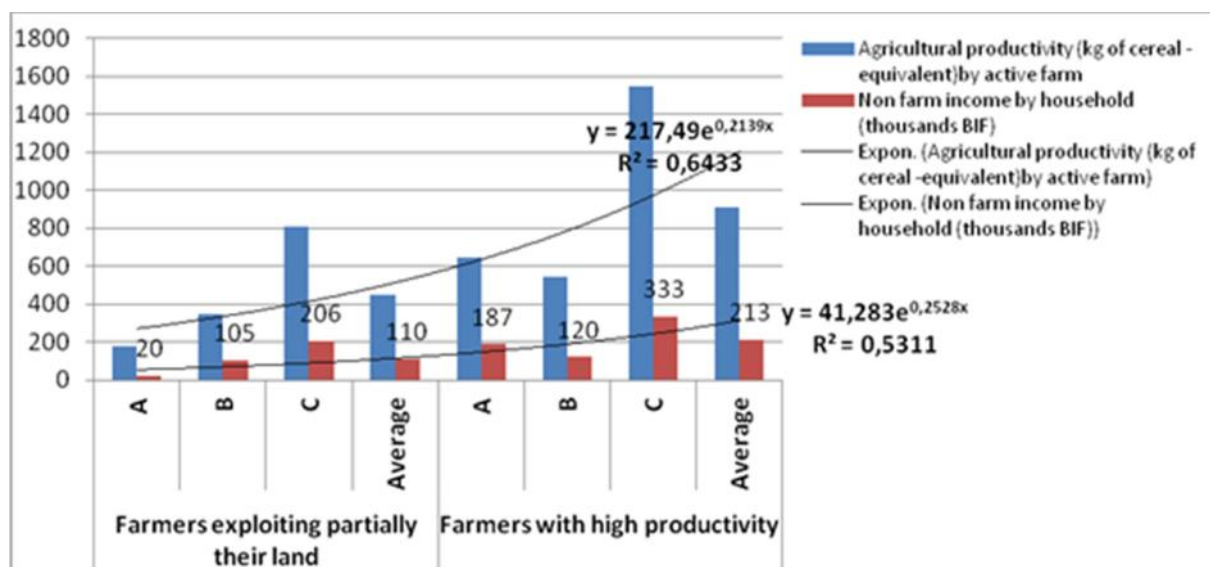


Figure 2. Influence of non farm income on production system (Our survey, 2012)

Typological analysis permits to get three sub-groups for each category of farmers: farmers exploiting partially their lands: 56, 32 and 12 % are classified respectively in A, B, and C sub-groups; farmers with high productivity: 28, 50 and 22 % are also classified in sub-

groups A, B and C. The analysis of data shows that non-farm income influences significantly the agricultural production (figure 2).

### Conclusion

The main constraints of farmers who exploit partially their land to spur family economy are insufficient of workforce, illiteracy, insufficient animals, etc., in other side, the group of farmers with high productivity has non-farm activities which procures to them much revenue, this non farm income is used to pay salaries, to get organic and mineral fertilizers, improved seeds, etc., and enhances rural economy.

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