RURAL RESILIENCE AND THE ROLE OF SOCIAL CAPITAL AMONG FARMERS IN KIRUNDO PROVINCE, NORTHERN BURUNDI

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Abstract: In Burundi, more than 90% of the active population is engaged in family agriculture, which plays a vital role in food production and constitutes more than 50% of the GDP. Before the civil war of 1993, Kirundo was deemed the "breadbasket of the country", as the region fed many parts of Burundi through growing particular foods such as legumes and cereals. Family farming was market-oriented. Kirundo alone includes 8 lakes which offer opportunities for field irrigation. Today, this region is the first province in Burundi which shows a high rate of malnutrition, as poverty has increased and a sharp 53.9 % decline in agricultural production has been witnessed between 1996 and 2009. The aim of this article is to analyse the role of social capital through the local association network in improving family agriculture and the resilience to climate change and conflict crisis. In this study, 73 farmers were surveyed in Kirundo province through means of a questionnaire, and the study was completed by collecting secondary data. Analysis of the data reveals that, despite recurrent droughts in that region which caused deaths due to famines and displacement of people to neighbouring countries such as Rwanda and Tanzania, 44% of the farmers who were surveyed were shown to have resilience to climate change. The analysis of data shows that these farmers were members of well organised local associations, and had learned about specific topics such as financial management, processing and storage of agricultural products and livestock. The social capital network positively influences their income and their resilience to climate change and conflict crisis.

Key words: Rural resilience, social capital, family agriculture, Kirundo Province, Burundi

1. Introduction

In the course of the last century, the number of local associations in Burundi has continued to grow worldwide and their nature and functions have continued to evolve. In Kirundo Province, most local associations have been formed as a response to the various crises brought by drought and cyclical famines in that region. Social networks are therefore of value (Putnam 2000), as they are the very basis of all social interactions and transactions, an idea that is captured by the term "social capital". The concept can be roughly defined as "institutions, relationships, attitudes, and values that govern interactions among people and contribute to economic and social development" (Grootaert and Van Bastelaer 2002). Furthermore, Rose (2000) defines social capital as follows: "Social capital consists of informal social networks and formal organizations used by individuals and households to produce goods and services for their own consumption, exchange or sale". In general, informal social networks comprise face-to-face relationships between a limited number of individuals who know each other and are bound together by kinship, friendship, or propinquity. Informal networks are 'institutions' in the sociological sense of having patterned and recurring interaction. However, they lack legal recognition, employed staff, written rules and own funds. In general, they are not formally structured as there is no principal but rather a platform for agents to exchange information, goods and services. On the other hand, formal organisations are legally registered, and hence have a legal personality. They are rule-bound and have to follow formal procedures in their management. In general, they have a secured annual budget which might be made up by its members, the market and / or the state. A formal organisation's membership can be made up of individuals and/or other organisations. In this respect,

an organisation is a corporate actor who, as a principal, co-ordinates its agents activities and benefits from the activities of the agents (Rose 2000).

The early work of Putnam *et al.* (1993) on the relationship between social capital and the functioning of regional governments in Italy is perhaps the most well-known and influential contribution to the discussion about the relationship between social capital and economic growth. The main finding of the authors is that regionally dispersed patterns of association membership, trust, and cooperation, form an important tool of facilitation for governance efficacy and economic prosperity. The Italian study was based on two decades of empirical data collection, in order to find explanations for the different functioning of regional governments in northern and southern Italy, and economic differences between the regions. As resilient communities can better cope with shocks, sudden change will not disrupt their development as much as in less resilient ones. Hence, development in communities that are characterised, amongst other things, by high levels of bridging social capital, and thus higher resilience, is likely to be more sustainable than in communities with lower levels of (social) resilience. Thus, DFID (2011) defines resilience as "the ability of countries, communities, and households to manage change, by maintaining or transforming living standards in the face of shocks or stresses, such as earthquakes, drought, and violent conflict without compromising their long-term prospects".

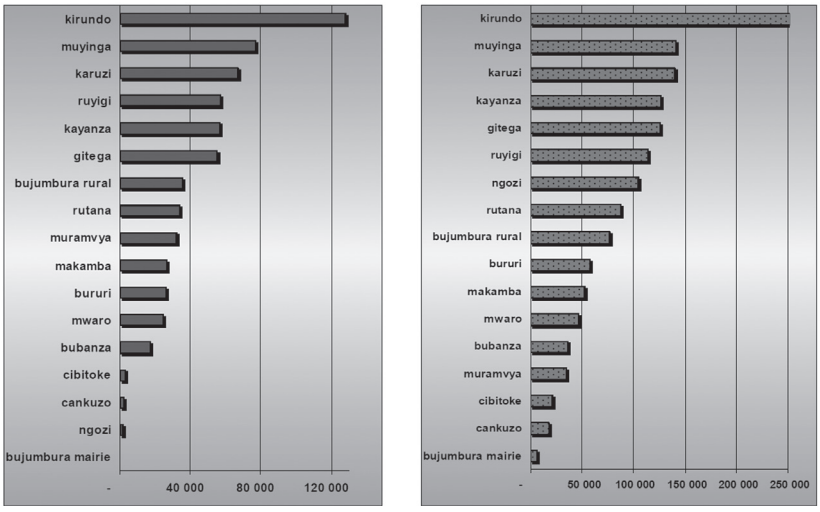

Figure 1. Provincial distribution of slices of the poorest population in Burundi
Source: (IMF 2010)

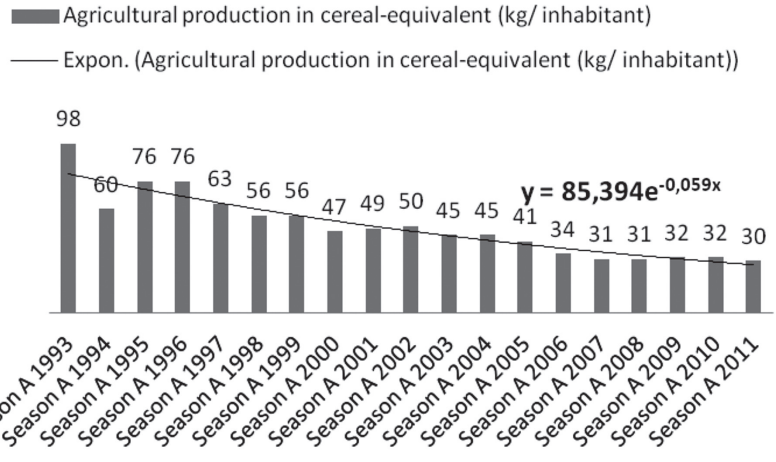

Figure 2. Agricultural production in cereal-equivalent (kg/inhabitant) from 1993 to 2011
Source: Author's calculations from data from Burundi Agriculture and Livestock Ministry

Before the civil war of 1993, agricultural production was sufficient to ensure food security for Burundi's population. Agriculture, livestock and more generally the development of rural areas play a vital role in any strategy to reduce poverty. Indeed, 90% of Burundi's population and 69% of the country's poor live and work in rural areas (figure 1). In those areas, food production is insufficient to ensure the food security of rural populations and malnutrition rates are particularly high (IMF 2010, p.16).

Burundi agricultural production declines (figure 2) from 98 kg of cereal-equivalent per inhabitant harvested in season A of 1993 to 30 kg of cereal-equivalent per inhabitant in season A of 2011, while the annual demographic rate is growing to 2.4 % (MININTER 2011). During the civil war from 1993 to 2005, many socio-economic infrastructures were destroyed and the well-being of the population has declined, the GDP per capita having dropped from $250 per capita before the civil war (1993) to $110 per capita in 2010 (IMF, 2010). Many people therefore live in food insecurity and a high rate of malnutrition exists for children under 5 years.

The main objective of this study is to analyse the role of social capital through the local association network in improving family agriculture and resilience to the climate change and conflict crisis

Through this study, we will compare three groups: (i) Group A with members in well organised local associations which are registered by the government and have experimented with training in a variety of different sectors (economy, agronomy, environment, etc.); (ii) Group B, whose members are part of local associations which are registered by the government, but are poorly organised, have undertaken little or no experimentation with trainings, and have a rather opportunist character when they see funders, and, (iii) Group C, those farmers who are not members of any local association and do not receive any help from financial institution.

2. Area description and methods

2.1. Area description

Kirundo Province is one of the 17 provinces of Burundi, and is located in the Northern Burundi. Kirundo Province has a surface area of 1703.34 km², with a population of 628256 inhabitants (UNDP 2005, p.14). The province is divided into 7 communes (Bugabira, Busoni, Bwambarangwe, Gitobe, Kirundo, Ntega and Vumbi).

Kirundo Province is bordered by Rwanda to the North, Ngozi Province to the South and Muyinga Province to the East. This is a province that straddles two natural regions, Bugesera and Bweru. Bugesera region includes the municipalities of Busoni, Kirundo Bugabira, Ntega and much of Bwambarangwe and Gitobe. It is a region with a very long dry season, with rainfall between 800 and 1200 mm. Bweru region meanwhile includes communes Vumbi, Southern Gitobe and a small party of Bwambarangwe. It is watered with rainfall exceeding 1200 mm. Kirundo province has over 5 lakes (Rweru, Rwihinda, Cohoha, Kanzigiri, Gacamirindi, etc.) which cover an area of 16, 000 ha. Many wetlands, mostly undeveloped, are occupied by rice cultivation. Since the year 2000, agricultural activities have often been paralysed by prolonged drought. The consequences of that situation are a continuous reduction in production and a population struck by famine. To remedy this, many stakeholders, NGOs, projects and local state structures are trying to help people through the financial or technical support such as improved seeds, mineral fertilisers, training in new agricultural techniques, etc which boost agricultural production and rural economy. This intervention approach has led many people to create local associations, most of them being opportunistic with the immediate aim of receiving available funding but sometimes lacking the organisation with which to create a sustainable network.

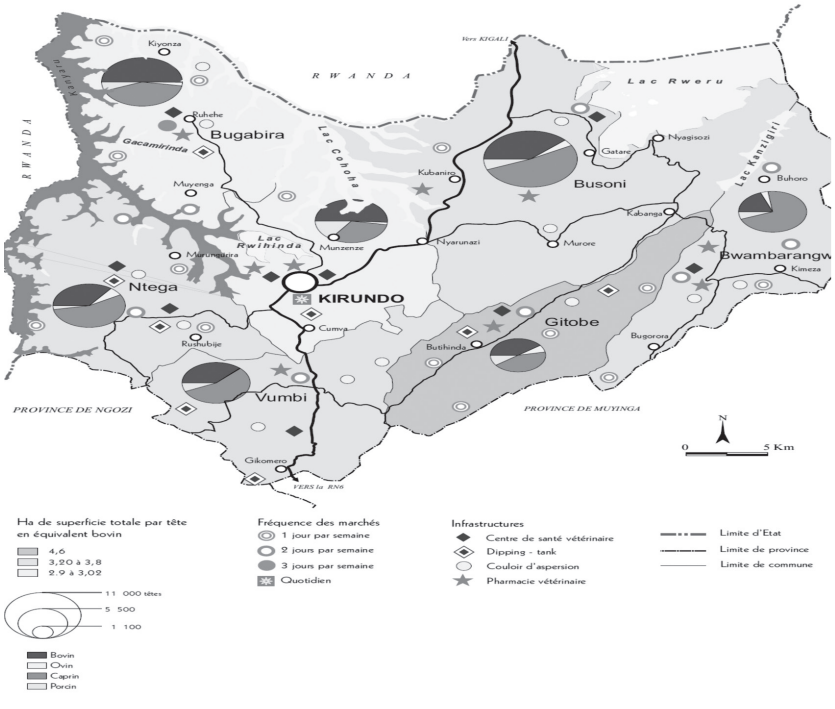

Figure 3. Administrative map of Kirundo Province: Source: URAM 2007

2.2. Methodology

An exploratory survey was conducted in 2010 among 355 farmers who were heads of households, randomly selected in seven communes of Kirundo; 50, 75, 30, 40, 55, 55 and 50 farmers were selected respectively from the communes of Bugabira, Busoni, Bwambarangwe, Gitobe, Kirundo Ntega and Vumbi. This sample was stratified and weighted by the number of agricultural farmers living in each municipality.

According to this survey, a comprehensive study was conducted with 73 farmers in 2011-2012, in order to find out why some farmers are resilient to shocks arising through climate changes and conflict crisis in this province and thus escape famine, and also enjoy high agricultural productivity compared to other farmers. The questionnaire survey technique was used. This study led us to subdivide farmers into three main groups:

Group A represents 32 farmers grouped in different local associations with long experience in the field; they are well organised and have received much training from national or international organisations, have experience in fields including agriculture, livestock, trade, financial management and crafts sectors and have cooperated with other national or international organisations.

Group B includes 15 farmers who are members of various associations, but they are young and inexperienced in the field, poorly organised and have not received training in the various sectors mentioned above, or have not yet received support from donors;

Group C accounts for the 26 farmers who did not work with any local association or have not received training from donors or other national or international organisations.

The research was completed through reference to literature related to the themes which developed. We used SPSS 16.0 to analyse our data, and analysed many parameters including the number of agricultural workers per household, the number of livestock per household, fertilisation, the consumption-sales ratio, agricultural productivity per farm assets, etc.

3. Results and discussion

The results in table 1 show that the farmers from group A have a high level of education compared to other farmers, 59% among them having completed primary school, while 13% completed high school, and the other 28% can at least read and write the local language (Kirundi), no farmer in the group being

illiterate; meanwhile, the farmers from groups B and C include many people who are illiterate: 47 % and 39 % respectively in groups B and C. The illiterate farmers develop a sense of inferiority compared to other farmers who can read or write at least the local language and they frequently differ from others by not joining local associations or participating in training organised by their associations or by donors, especially when this training requires taking notes. It seems that education can improve productivity directly by the quality of work done, by the ability to adapt to change, and by encouraging a state of mind conducive to the adoption of technical and organisational innovations. The development of literacy and numeracy skills can help such farmers to collect and analyse internal and external information on their operations, develop the ability to anticipate necessary, especially when radical changes, and heighten the awareness of the challenges and opportunities of production and non-agricultural activities. Therefore, the increase and development of human capital improve the technical and managerial practices of farmers and offer to them the chances of success (Barrett *et al* 2001).

Table 1. Level of education of farmers surveyed in Kirundo Province

Groups	Level education of farmers (%)				
	Primary	Secondary	Read and written Kirundi	Illiterate	Total
Group A	59	13	28	0	100
Group B	40	0	13	47	100
Group C	42	0	19	39	100

Source: Own survey 2011–2012

Analysis of data from the survey shows that a high percent of farmers for Group A (58%) fertilise crops compared to 20% of Group B and 22% of Group C. The high number of farmers in Group A who fertilise their crops is linked to modern farming techniques learned during the training received from national or international organisations and other inputs through support from donors. To have a positive impact on a highly visible field, donors required that farmers gather in associations. As we will see, these cooperative relationships that have developed between farmers grouped in associations permit a boost in crop production. To establish supportive relationships effectively, it is necessary that local networks are dense, as in this example, but also that external opportunities exist to provide the necessary incentive policies. These results are consistent with those found by Coleman (1988) and Fukuyama (1995), Cramb (2006) and Cramb (2007) who noticed that social capital played the core role in rural development. Farmers in Group A can fight more effectively against erosion than farmers in the other groups for three main reasons: (i) advanced knowledge on erosion control techniques, learned during internships and visits to other farmers, (ii) using the external labour wage in addition to family labour in order to protect the soil through agricultural techniques such as digging pits, planting hedges etc., and (iii) possessing many more cattle than farmers in groups B and C.

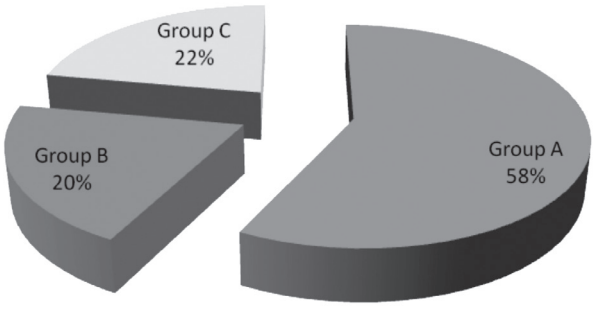

Figure 4: Fertilisation of crops
Source: Own survey 2011–2012

These results show that when the amount of labour and means of production included in each unit area begin to decrease (making the system less intensive), a downward trend in fertility occurs. This situation is observed in groups B and C, whose farmers experience lower agricultural productivity (Cochet 2001).

Table 2. Agricultural Productivity analysis by Farmer Assets (Kg/ farmer assets)

Crops	Mean (kg/ assets)		
	Group A	Group B	Group C
Bean	334,66**	81,15	94,42
Maize	313,58**	17,08	52,31
Cassava	435,14**	164,83	185,1
Banana	1328,5**	316,67	225,37
Sorghum	169,06*	71,67	85,67
Tropical Livestock Unit	2,49**	0,747	0,594

**: Highly significant
*: simple significant at $p<0.05$
Source: Own survey 2011–2012

On viewing these results, it is apparent that farmers in Group A are highly productive compared to farmers in Groups B and C, in terms of bean crops, maize, cassava, banana, sorghum and Unity Tropical livestock. This is explained by the fact that the farmers in Group A apply modern farming techniques learned during the training received through their local associations. In addition, technical and financial support received from donors has led to this high agricultural productivity (including mineral fertilisers, livestock through the chain of solidarity, improved seeds, etc.). Also, when farmers become members of active associations, it is easier to obtain agricultural credit and requires fewer conditions because their associations endorse them. The observations made in this study also confirm the study on commercial fishing industries in North Queensland, Australia, in which Marshall *et al.* (2007) base social resilience on four different pillars: (i) risk perception towards change, which depends on the alternatives people have in terms of the financial situation, and on the social capital they have at their disposal; (ii) human capital, whereby the more skills and experience people have, the less risk averse they are, and the better able to cope with

change; (iii) people's perception of their ability to cope with change (iv) the interest people have in actually adapting to change.

Table 3. Consumption-sales ratio of the main crops of Kirundo Province

Crops	Ratio=Consumption/ sales		
	Group A	Group B	Group C
Bean	2,3	0,4	0,3
Maize	6,1	0,1	0,3
Cassava	1,7	0,3	0,5
Banana	4,2	2,8	0,9
Sorghum	2,3	0,4	0,6

Source: Own survey 2011–2012

We note that the farmers who are members of active local associations display stronger performance in terms of agricultural productivity. These farmers orient their agriculture to the market while those farmers in groups B and C orient their production towards consumption. The explanation for this is that in group A, farmers receive agricultural credit more easily because of the guarantee offered by their associations ,allowing them to buy agricultural equipment etc., and can also apply new agricultural techniques learned in their local associations. Moreover, the fact of belonging to well organised local associations provides an active social capital and leads to a social resilience in raising agricultural production and economic development.

4. Conclusion

Social capital accessed through the network of well organised local associations allows significant improvement of the production systems and permits farmers to withstand, recover from, and reorganise in response to crises such as climatic disturbances or conflict crises; membership in poorly organised associations, on the other hand, has no significant influence on the well-being of farmers. This study thus leads us to conclude that the social capital gained through well organised associations boosts the socio-economic development of country, and the government is therefore advised to sustain and support the development of well organised local associations in order to raise the well-being of the population.

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