

Social Capital and Transaction Costs in Fulani Women Dairy Processing Units in the District of Gogounou, Benin

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Abstract: *This paper analyzes the importance of social capital in the local dairy processing units of the Fulani' women in the District of Gogounou, Benin. Results showed that when relationships between suppliers and clients are based on strong ties, freely milk supply and credits arrangements are predominant in transactions, contrary to relationships based on weak ties. These results suggest the distinction of two types of social capital, namely structural social capital and relational social capital. The latter corresponds to dairy processing women relationships based on strong ties or weak ties where deepening of trust favor transactions with credits arrangements.*

Keywords: Strong ties and Weak ties, Transaction costs, perishable goods, Fulani women, Benin

1. Introduction

Over the last few decades, several empirical studies on social capital and its benefits at the individual level have addressed various fields and themes, particularly those characterized by economic exchanges. The starting point is that the neoclassical economic theory of perfect markets characterized by efficient transactions independent of personal relationships between actors does not take into account certain transactional contexts that make markets inefficient (Favereau, 1989). Many authors have established that social capital contributes to the economic performance of firms by improving market efficiency, particularly in the context of imperfect markets where transaction costs are high (Barr, 2000, Fafchamps and Minten, 2002; Johnson et al., 2002, Jacques et al. 2018). However, the empirical application of small-scale agri-food enterprises is rare. Most studies of social capital in the context of agricultural enterprises, which are typical of imperfect markets with high transaction costs (Staal et al., 1997), focused on modern or semi-modern firms (Barr, 2002, Johnson *et al.*, 2002, Fafchamps and Minten, 2002). As Barr (2000) notes, social capital value may vary with the type of firm. Thus, according to Grootaert and van Bastelaer (2001), although there is evidence of the key role of social capital in development, case studies are still needed in different sectors.

The objective in this paper is to analyze the importance of social capital in controlling transaction costs within small-scale agri-food enterprises activities, notably concerning of commodities and sales of processed products. The case study is based on the Fulani women dairy processing units, in the District of Gogounou, Benin. Dairy processing into milk cheeses constitutes traditionally the main source of income of Fulani women (Ogodja et al., 1991). On the other hand, reducing post-harvest losses of highly perishable foods such as dairy through increasing agro-industries systems would contribute to the sustainable resolution of food security problems (Nout et al., 2003). Our results could guide semi-modern agri-food processing units to better management of commodity markets, in the context of

agricultural products markets where demand response may be slow and available quantity may be low.

2. Theoretical and Analytical Framework

The basic idea of the concept of social capital lies in the fact that networks of personal relations can provide individuals with a kind of capital that they can decide to use for a specific purpose (Bourdieu, 1980; Coleman, 1988; Lin, 2001). The networks of personal relationships can take several forms, corresponding to the multidimensional aspect of the sources of social capital (Woolcock, 1998). Granovetter (1973) conceptualizes strong ties and weak ties, which correspond respectively to bonding social capital and bridging social capital, terms developed by Woolcock (1998). The former refers to relations between members of the same family, or close or neighboring friends, while the latter refer to distant friends, even in geographical perspectives. Authors have generally notified that social capital thus comprises both the network and the assets that may be mobilized through that network. In others words, Nahapiet and Ghoshal (1997) distinguished relational social capital and structural social capital. Structure capital refers to the connection model; relational social capital refers to the assets that are generated from the relationship.

When markets fail, resulting in high transaction costs, social capital plays an important role in facilitating access to information and reducing costs associated with trade execution and coordination (Kranton, 1996; Fafchamps and Minten 1999; Johnson et al., 2002; Jacques et al. 2018). According to Hobbs (1997), transaction costs can recover: 1) before the transaction, market information costs related primarily to research and selection of trading partners, and price information, 2) during the transaction, the costs of negotiation including the costs of the agreement on quantities and prices, the delivery of the product or service and the drafting of the contract, 3) after the transaction, verification costs corresponding to the verification of the contract requirements and the reliability of the services. Regarding transactions costs relates to uncertainty zones in success of contract, Barr states solidarity networks can help

firms reduce the uncertainties they face in their activities (Barr, 2000).

Social capital approach used in this study relates to types of social ties, whatever strong or weak ties (Granovetter, 1973). Also, Coleman's definition of social capital stipulating that "the structure of relations could help establish obligations between social actors, create a trustworthy social environment, open channels for information, and set norms and impose sanctions on forms of social behaviors" (Coleman, 1988) is considered. Then, conceptualizing social capital, we emphasized three levels: i) obligations of services between partners, ii) trustworthy in relationships and its influence on payments arrangements, iii) networks sustainability through norms and sanctions. These described points are put in relation with market efficient improvement, respectively reduction of search costs, facilitation of modes of payment, and sustainability of exchanges partnering under credibility norms. On these perspectives, the present study addresses the importance of the social capital controlling transaction costs within small-scale agri-food enterprises activities, in terms of the influence of different types of social ties on efficiency of dairy processing women partnership with commodities suppliers and processed products buyers, in the District of Gogounou, Benin.

3. Methodology

The study was conducted in the District of Gogounou. The District of Gogounou is located in the department of Alibori (Northern region) and is the main dairy production site in Benin. It is a located place of the largest livestock market and the siege of the National Association of Professional Organizations of Breeders (*ANOPER*), which is the umbrella organization of livestock organizations. Dairy production in this District comes mainly from the traditional systems of the Fulani breeders whose women are involved in dairy processing activities. This study focused on domestic dairy processing units. Sample comprised Fulani women of about 35 years. The average size of livestock in the households is 150. These small-scale processing units use medium-to-large pots for preparation, dairy collection plans, cooking utensils (bowls, calabashes, etc.) and traditional three-stone fireplaces heated. They do not have modern conservation facilities. The labor force is mainly family and consists of the daughters of the women processors. Their number is estimated at an average of 2 per household.

Three cheese markets (Gamagou, Gounarou and Zougou-Pantrossi) were selected with the help of technicians from the Communal Agricultural Development Office (*SCDA*). These three markets are sampled because they represent the main sale points of women processing dairy in their hamlets. Note that the markets of Gamagou and Gounarou are daily sales sites located near the interstate Benin-Niger road while the market of Zougou-Pantrossi is a borough market and is weekly animation. The sample is random and consists of 85 processing women in the markets. Data were collected on the basis of a questionnaire and interviews guide. The questionnaire was inspired by the analysis of social capital in the imperfect markets of Fafchamps and Minten (2002). It contains four parts. First part reports structure of relationships with suppliers, permanent relationships exist

with suppliers, type of ties with suppliers, type of dairy provision, distances between partners' houses or villages, frequency of business meetings, and type of contracts. Second part focuses on financial aspects concerning transactions with suppliers, modes of payments and possibility of credits arrangements; and partner's credibility control and sustainability of relationships. Semi-structured interviews were held with women on the history of their dairy activities, their relationships with suppliers and clients, business experiences, opportunities and challenges on dairy provision and milk cheeses sale, interests of relationships establishment with partners, social norms and strategies to control credibility between partners.

Analytical approach employed is qualitative description based on Coleman's (1990) observation that social capital is defined by its function, and therefore lends itself more to qualitative studies or quantitative studies using qualitative data. Analysis allowed understanding the functions or usefulness of the different types of social ties in dairy processing women activities, especially related to improvement of the efficiency of the market. In others words, we describe how different aspects of structure and functioning of relationships with suppliers and clients help dairy processing Fulani women to deal with transactions costs challenges (ex. reduction of costs, facilitation of payment methods, and credibility in transactions). Descriptive statistics (frequency) were used for quantitative data.

4. Results

4.1. Social capital and transaction costs on processing women' dairy collection system

4.1.1. Description of types dairy supply networks

All the dairy processing women surveyed have established permanent dairy supply networks with suppliers. We note 47% of women dairy supply networks are strong ties, and 53% of women dairy supply networks are weak ties. Dairy supply networks with strong ties involve processors who collect milk within their family area (co-wives, close relatives, etc.). Most of these women are made up of rotating collection system which members vary from 3 to 5. Within dairy rotating collection system, each member, according to his rank can receive a certain quantity of milk from the others' household dairy production. There are also a few numbers of dairy processing women with strong ties' dairy supply network, who collect milk directly through supplier-client relation (without rotating collection group). The majority of women in dairy supply networks with strong ties (almost 95%) are located less than 3 km of each other. Their meetings are almost daily based, because women share mostly the same household. Consent and commitment in the system are verbal and indicate startup of reciprocal obligations between the dairy processing woman and her relatives for daily collection of milk for cheeses cooking.

Dairy processing women in supply networks with weak ties include processors who establish loyalty relations with suppliers who are not their relatives. Most suppliers (60%) are located more than 15 km to these dairy processing

women (Table 1). Milk collection is periodic, about 3 times a week. In some cases, processing women go directly to the suppliers' dwelling, or they meet at fixed points. Their commitment in client-supplier relationship is verbal.

Table 1: Description of dairy processing women's supply networks

Type of ties	Strong ties	Weak ties
% of women in supply networks	47	53
Type of collection system		
Rotating collection system	82.5	-
Fidelized client-supplier relationship	17.5	100
% of women with suppliers in their networks located :		
Less than 3 km	92.5	13.3
Between 3 km and 15 km	5	22.2
More than 15 km	2.5	64.4
Frequency of meetings	Almost daily	Periodic
Type of contract	Verbal	Verbal

Source: Survey, June-July 2014

4.1.2. Dairy supply networks and milk collection costs reduction

Processing women's dairy supply networks, characterized by the shared programs within the partners (for example, rotating collection system or loyal client-supplier relationship), periodicity and fixed meeting points, guarantee that the processor can get access regularly to quantity of milk needed to cheeses' production. This helps to reduce search costs. In particular, all Fulani women are likely to have cheeses' production activity, and then, it is necessary for a processor who wants milk to know how possible it is to get it. On the other, milk is perishable product. The proximity of the women in the group allows obtaining fresh milk under the best conditions for cheese preparation. They avoid loss of value of products.

4.1.3. Dairy supply networks types and its influence on the diversification of payment modes

Dairy processing women access through their supply networks almost the total quantity of milk needed for cheese production. Table 2 presents the payment arrangements by women within their dairy supply networks. We note transactions are not monetary when we consider more than 80% among the processing women with are women concerned in rotating collection system. They are guided by the principle established between members of the rotating collection group, consisting to gather daily a certain quantity and quality of milk from each member, without paying money. On the other, processing women in supply networks based on strong ties with monetary transactions (17%) are those who can get access to milk under client-supplier relationship, with suppliers in their family circle. We note 100% of latter dairy processing women can benefit from credits within their supply networks. Based on their supply networks, dairy processing women with strong ties, can develop their activity beyond their household milk production capacity. Dairy processing women with supply networks based on weak ties, transactions are monetary. Dairy processing women obtain milk within weak ties control milk quality, and negotiate prices accordingly. All of women report that there is no problem of price asymmetry

during transactions between partners. In fact, these transactions involve Fulani women which are traditionally or culturally concerned by the dairy processing's activity. The customization of relationships with suppliers gives the possibility of credit in transactions, when clients lack money. But only 4% of dairy processing women in weak ties benefit from credits opportunities.

Table 2: Description of mode of payment and credits arrangements with milk suppliers

	Strong ties, N=40	Weak ties, N=45
Modes of payment		
Monetary	17.5	100
Non-monetary (rotating collection system)	82.5	0
Credits in the transactions with suppliers (%)		
Purchase on credit	100 ^a	4.4
Buy always for cash	00 ^a	95.6

a: N = 7 for supply by strong links without a collective network system

Source: Survey, June-July 2014

4.1.4. Importance of the partners' credibility for the sustainability of dairy supply networks

All the women surveyed stressed the importance of maintaining permanent supply networks. This importance lies not only in the advantages dairy supply networks offer, but also its creation will be difficult after processing women losing one. Therefore, it is required that processing women to be credible within supply networks. On the supply networks with strong ties, partners' credibility are controlled by their social obligations that ensure the stability and sustainability of transactions. Indeed, compliance with the rules in the rotating collection system is not only to guarantee dairy supply, but also to respect principles of solidarity and reciprocity vis-à-vis relatives in the Fulani society. On the other hand, these processing women report they adapted their rotating collection system when periods of transhumance have occurred. When animals are taken by transhumance, the system may be temporarily discontinued or the revised quantities collected. None conflicts are mentioned; the system has always been in place longtime ago.

Dairy processing women within supply networks based on weak ties explain that their credibility is assessed by suppliers through the regularity and duration of transactions. Even if only a few transactions are sufficient for the suppliers to integrate them among its clients, most of dairy processing women in the weak ties indicate that benefiting from credit arrangements is not common. In addition, the period allowed for repayment of credit runs until the next meeting, given that the meetings are periodical. Most of processing women responded that they had settled credits within the deadline. There are rare cases with deferring of credit repayment date when the clients faced particular events, such as sickness or personal family problems (health, death, etc.). But as soon as she returns, she provides explanations about her absence and pay penalty. On the other hand, the processors report that they would not have had new offers without paying past debts.

4.2. Social Capital and Transaction Costs on the cheese marketing of dairy processing women

4.2.1. Social capital and its influence on reducing milk collection costs

100% of the processing women surveyed in the Zougou-Pantrossi market have a loyal relationship with cheese buyers to whom they provides their production on Thursday, while less than 15% for processing women in the Gamagou and Gounarou markets have loyal relationship with their customers. Most of the women in Gamagou and Gounarou sell their cheeses to passengers who make stops at these points to make purchases. This explains why there are no frequent exchanges with these customers. For all processing women, relationships with clients are weak ties. For those who have established frequent exchanges (45%) with clients for wholesale sales, the commitment between the partners is verbal. It begins with the first contacts, and the regularity of the transactions strengthens the commitment. The table 3 describes the structure of relationships between processing women and their clients.

Table 3: Description of relationships existing between dairy processing women and their clients

	Gamagou (N=28)	Gounarou (N=25)	Zougou-Pantrossi (N=32)	Total N=85
Wholesale (Fidelized relationships)				
Yes	10.7	12	100	44.7
No	89.3	88	0	55.3
Target audience	Passengers	Passengers	Cheese' traders	-
Type of contract	-	-	Verbal	-
Type of ties	Weak ties	Weak ties	Weak ties	-

Source: Survey, June-July 2014

4.2.2. Structure of relationships between dairy processing women and their clients and its influence on reducing milk collection costs

About 30% of dairy processing women in the Gamagou and Gounarou markets responded not to always find clients, compared to 6% of dairy processing women among surveyed in the Zougou-Pantrossi market (Table 4). We note that the loyal wholesale exchanges' partnerships with customers reduce the dairy processing women's uncertainty about the sale of their products. For example, most of dairy processing women surveyed in Zougou-Pantrossi market state they have just come to provide cheese for their clients according to pre-established schedule. Women can sell their cheese quickly, for example 75% of women sell regularly their products within Zougou-Pantrossi market system. Thus, they are avoiding the risk of loss of value likely occurring with cheese's high perishability.

Table 4: Description of market access of dairy processing women

	Gamagou (N=28)	Gounarou (N=25)	Zougou-Pantrossi (N=32)
Dairy processing women does not always find clients (%)			
Yes, often	32.1	28	6.2
No never	28.6	24	75
Yes, sometimes	39.3	48	18.8

Source: Survey, June-July 2014

4.2.3. Social capital and its influence on the diversification of the modes of transaction within dairy processing women relationships with clients

The personalized relationships lead to the facilitation of transactions with easy negotiation on the prices, in particular when there is a failure on the quality of the cheeses. 100% of the dairy processing women answered that clients control the quality of the products. In general, transactions always take place with a consequent price negotiation. Nearly 90% of transactions are in cash (Table 5). There are a low proportion of credits (8% credit to clients and 3% advances received from clients) within the loyal relationships with clients. Dairy processing women state that these relationships are maintained for existent benefits, such as regular selling or buying. In other words, these relationships are not very deepened to take into account confidence which can imply credits modes in transactions.

Table 5: Modes of payment on transactions within dairy processing women's relationships with clients

Credits in transactions (%)	Wholesale within fidelized relationships (N=38)
Sales on credits	7.9
Cash	89.5
Acomptes from clients	2.6

Source: Survey, June-July 2014

4.2.4. Importance of credibility of partners for the sustainability of relationships with clients

We note that dairy processing women provide cheese to their clients on credit; the next meeting period is the deadline for repayment. They report that in general the customers pay within the date; it is the condition to obtain a new sale. No situations of conflict in transactions were reported. The processing women explained that both traders and they are aware the level of activities is low when transhumance is occurring. Then, they adapt the transactions terms. For example, during the dry season, some dairy processing women offer cheeses to their clients, while others offer eggs, and local chickens. Relationships are maintained until the regular cheese production periods where dairy processing women can rely on relationships with clients to achieve wholesale goals.

5. Discussion and Conclusion

The present study demonstrates the importance of social capital in controlling transaction costs within small-scale agri-food enterprises. The types of relationships with commodities suppliers and processed products buyers are addressed. The case study is based on the Fulani women dairy processing units, in the District of Gogounou, Northern Benin. Dairy processing women have their own permanent dairy supply networks. We note dairy supply networks based on strong ties and dairy supply networks based weak ties. Similarly, some women have loyal relationships with their clients for wholesale of cheeses, only with weak ties. The existence of cow's milk supply networks, characterized by shared programs between the partners (ex. rotating collection system or loyal client-supplier relationship), periodicity and fixed meeting points, guarantee that the

processor can get access regularly to quantity of milk needed to cheeses' production. We note that loyal wholesale exchanges' partnerships with customers reduce the dairy processing women's sale uncertainty. The results of this study shows social capital's role in reducing business operating costs and are consistent with Fafchamps and Minten (1999, Barr (2000), Johnson et al. (2002) and Jacques et al. (2018). In addition, focusing on supplier networks and relations with clients, the study emphasizes the benefits of social capital with focus on material's flows (milk as raw commodity), rather than information flows as reported in previous studies (Barr, 2000; Lin, 2001).

The advantages differ when considering the type of social ties existing within partners. These results corroborate the assumption that different types of social capital provide different benefits (Coleman, 1988; Field, 2008). In particular, in the case of local dairy processing units, supply networks based on strong ties can support the collection of quantity of milk required to cheese production without financial resources. Milk supply takes place within rotating collection system. Strong ties demonstrate "economic capital" value of social capital (Bourdieu, 1980; Svendsena et al., 2010). On the other, we note all dairy processing women achieving milk collection within family circle through monetary transactions, can benefit from credits within their supply networks. Based on their supply networks, dairy processing women with strong ties can develop their activity beyond their household milk production capacity. Strong ties constitute a productive component of social capital (Granovetter, 1973). Within dairy supply networks based on strong ties, the norms of reciprocity and solidarity inherent to family ties guarantee credibility of partners. Thus, these norms secure the system, and promote the regularity of the processing women in the business. These results are contrary to those of Bigsten et al.(2000), Minten and Kyle (1999), and Fafchamps and Minten (1999) who report that family ties are not a major aspect of social capital in manufacturing enterprises in Africa and agricultural products trade in Congo and Madagascar respectively.

Within the weak ties between dairy processing women and her partners, the transactions are highly monetary. There is small proportion of credits with suppliers (4%) and with clients (8%), although there are loyalty relationships. Thus, we recognize that this is more a simple cooperation's linkages associated with the supply of milk or the sale of cheeses. As noted by Ghosh and Ray (1996), simple cooperation was favored in such a condition when milk collection costs are high. Indeed, the partners have to meet their objectives of trade of milk or cheese. They have not deepened the trust between them to take into account credit and advances on transactions, as payment modes. This limits often the partners in developing their business, with the advantages associated with such modes of payments. Thus, it is not a demonstration of "strengths of weak ties" as conceptualized by Granovetter (1973). Moreover, a low proportion of dairy processing women or their clients within the weak ties accepting credits or advances strive to establish their credibility with the regularity of transactions and the respect of credits' repayments dates. These results are similar to those reported by Fafchamps (1996) in Ghana,

and Fafchamps and Minten (2002) in Madagascar; they noted credits' repayments are crucial to relationships sustainability.

Then, dairy supply networks based on strong ties described with Fulani' women context in this study carry out some advantages on strengths' demonstration over those based on weak ties. Concretely, credits arrangements are predominant within relationships based on strong ties. It also exists within relationships with suppliers and clients based on weak ties, in low proportion. Then, the strengths of ties are not systematically associated to whatever strong ties or weak ties existing between partners, but merely it depends on relationships' contents the partners agree with. In sum, the results of this study suggest the distinction between two forms of social capital in dairy processing activities of Fulani women, in relation with milk suppliers and cheese' clients. There are structural social capital and relational social capital (Nahapiet and Ghoshal, 1997). Structural social capital appears in weak ties with suppliers and clients where there is no credit. Relational social capital appears in strong ties with suppliers and weak ties with suppliers and clients where there are credit and advances payment opportunities. The customization of relationships integrates the elements of trust and reciprocity that support transactions and make possible payment arrangements. On the other, this study reveals that two types of social capital (strong ties and weak ties) are effective to overcome transaction cost constraints at different levels; further studies can answer the question about which ones are more economically productive.

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