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CREDIT ACCESSING AND FAMILY FARMING: AN EVIDENCE FROM BURKINA FASO

Dr. Mahamadi Nanéma¹, Dr. Théophile Bindeouè Nassè² & Pr. Alidou Ouédraogo³

¹Norbert Zongo University, Koudougou (Burkina Faso)

²University of Business and Integrated Development Studies, (Ghana)

³University of Moncton, Moncton, (Canada)

*Corresponding Author: Dr. Théophile Bindeouè Nassè

Corresponding Author Email: tnasse@ubids.edu.gh

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ABSTRACT

This research focuses on the issue of financing family farms in Burkina Faso. To this end, a survey of 275 family farms was carried out in 2020. The research results revealed that the needs of family farms are not completely satisfied. The credits granted mainly concern small amounts. Productive investments which constitute medium and long-term investments capable of inducing significant improvements in agricultural production are almost unsatisfactory. Moreover, analyses have shown that income determines access to credit. This factor reflects at a certain level the capacity of family farmers to provide the financial guarantees required by microfinance institutions.

The current conditions of banks do not favor the development of the agricultural sector and the improvement of the living conditions of the populations in rural areas. It is, therefore, necessary to rethink the financing of agricultural activities and to define a long-lasting and sustainable financing mechanism.

Keywords: Credit Accessing, Family Farming, Financing, Burkina Faso.

INTRODUCTION

Like other countries in the sub-region, Burkina Faso's agricultural policy aims to guarantee food sovereignty and make the agricultural sector the engine of the national economy.

At present, it oscillates between promoting agribusiness and family farming as models to promote the emergence of a structured agricultural sector, competitive, and integrated into the sub-regional economy. But, for the achievement of such an objective, access to bank credit remains a fundamental issue that is still struggling to find the appropriate form. Given the place of agriculture in the Burkinabè economy and the importance of the activity of small producers in the sector, it is essential to imagine an original mechanism for granting agricultural credit at the level of banks to allow a real promotion of family farming. In Burkina Faso, we have a plethora of banks, but despite this boom in the Burkinabè financial system, the observation is that access to financial services remains a worrying issue, especially for rural areas. The Burkinabè banking system avoids engaging in agriculture. There are still difficulties in the access of family farmers to bank credit. However, most funding attempts failed to take into account the diversity of crops and the complexity of the needs of family farms. As Nanéma, Nassè, and Ouédraogo (2021) underline it some internal and external factors can influence projects productivity and performance in developing countries. For Bandé and Nassè (2020) it is rather a lack of an appropriate communication. However, financing is an important element in meeting the needs for technologies and production factors and improving income.

The false “credit culture” especially in rural areas where the loan is often considered as a grant, due to the institutional history in terms of credit (public development banks) and which still resurfaces today, especially during periods of election, complicates loan repayments (Lapenu, 2007). Thus, the improvement of agriculture supposes financial resources which the farmer often does not have at the opportune moment either by a total refusal or by rationing of the amount requested by the loan institutes. Therefore, the issue of access to credit is fundamental to agricultural diversification. Despite this, agricultural populations do not have or have difficult access to financial services. On the one hand, the demand for credit is generally scattered and concerns small amounts because it is often rationed. On the other hand, repayment prospects are not secure due to climatic hazards, low yields, but also an unfavorable socio-economic environment (Deveze, 2000). According to DID (2010), for the majority of developing countries whose GDP depends heavily on agricultural production, operating credit constitutes the basic tool for improving agricultural productivity and according to Ouédraogo and Gentil (2008), each poor person, thanks to credit, could turn into a micro-entrepreneur and trigger a process of accumulation and economic success. Authors (Diagne & Zeller, 2001; Bassole, 2003 cited by Fall, 2006) believe that access to credit improves the conditions of access to good quality inputs and strong use of productive technologies. Their reflections focused on the impact of additional resources through rural credit on poor producers to enable them to equip themselves and meet the expenses of agricultural campaigns. This induces a clear improvement in yields and, by extension, in income.

This sought- E tries to lead a reflection on the analysis of factors that determine access to credit and non-farm family in Burkina Faso. In other words, the aim is to explore both exogenous and endogenous factors determining access to credit for Burkinabé family farms. Why when several farms apply for a loan, some receive it and others not? This question will highlight the structural, behavioral, and performance factors that justify access or not to credit by farmers.

The general objective of the research is to analyze the determinants of access to credit for family farms in Burkina Faso. It wants to demonstrate that easy access and efficient use of credit combined with other production factors can significantly contribute to improving the living conditions of producers. So specific, it is:

- *produce a detailed description of farms as well as the parameters of access to financial services;*
- *explore the determinants of the accessibility of farms to the credit market.*

LITERATURE REVIEW

II. Conceptual Framework

II.1. Conceptual Analysis of Family Farming

II.1.1. Definition

Family farming is an agricultural system based on small farms worked by each family consuming part of its production. The expression tends to replace other equivalent terms without being exactly synonymous: peasant agriculture (to emphasize the majority societal dimension of this system in certain regions of the world which are still largely rural) or subsistence agriculture (to emphasize self-consumption). Family farming is largely the result of P South ays said that it concerns more than half of the assets. It occupies 2.6 billion of the human population which produces 70 % of the world's food production. Family farming has not disappeared from the so-called " northern " countries where it represents a tiny part of the production, but concerns a few million very small producers, often not listed in agricultural statistics which only count so-called professional farms. Family farming also subsists in the form of rural or urban gardens, or as part of a multi-activity to supplement small incomes (retirees, workers, etc.). Bosc and Losch (2002) define family farming as a form of production characterized by the special link it establishes between economic activities and family structure. This relationship influences the decision-making process, i.e. the choice of activities, the organization of family work, the distribution of responsibilities and income, the management of factors of production (land, water, seeds, raw materials, equipment, loans, etc.), and the transmission of family patrimony. Merelet and Jamart (2007) show that family farming refers to a domestic unit in which production and reproduction are intimately linked and for which there is a single decision-making body. The family represents the first level of planning, decision-making, and action within a production system that can contribute to a model of sustainable economic and social development. This type of agriculture, which provides the bulk of the world's agricultural production, plays an essential role in the "southern" countries, where it provides a good share of employment. Large-scale commercial agriculture, on the other hand, relies on the concentration of capital and/or land. For the FAO (Food and Agriculture Organization of the United Nations) cited by Delfosse (2015), " family farming encompasses all agricultural activities based on the family, concerning many aspects of rural development. Family farming makes it possible to organize agricultural, forestry, fishery, pastoral or aquaculture production which, under the management of a family, is essentially based on family labor, both men and women. ". CIRAD specifies definition criteria: in 81 countries studied, farms of less than 5 ha represent 94 % of the total, those of less than 1 hectare, 72 % (French average in 2010: 55 ha). CIRAD adds three criteria:

- Only family members work full time: they are not linked by salary ratios, but by domestic ties. Work creates strong links between family and exploitation;
- Part of the production is consumed by the family itself: family farming certainly supplies the markets, but self-consumption is also a product of this work;
- The capital is family-owned: it is inseparable from the family patrimony.

II. 1.2. Prejudices Surrounding Family Farming

Family farming is still very often associated with qualifiers such as small, archaic, non-modern, unproductive, self-sustaining, outdated, obsolete, unable to innovate, resistant to change, immobile, uneconomic, uncompetitive, unsuitable for the market, poor, etc. As for the large agricultural holding endowed with means of production with a high capital content, it is more often qualified as modern, dynamic, enterprising, integrated into the markets, efficient, profitable (Bélières et al., 2003; Narayanan and Gulati, 2002; Vannoppen et al., 2005). Bélières et al. (2003) provide answers to the myths surrounding family farming : (i) Family "Anti-economic": Numerous analyzes show the competitive advantages of family farms in terms of valuing factors of production: family farms can be more efficient economically than other so-called modern forms of agriculture; (ii) "Immobile" family: Family farms have shown their dynamism, their flexibility, their capacity to innovate, to integrate innovations, to provide better responses to market signals and to adapt to rapid changes. The economic and institutional context (sometimes at an unfortunately high social and economic cost). (iii) "Marginal" family farming: Family farming makes an important contribution to the economy (percentage of GDP) and to employment, both in African countries than on other continents: 1.3 billion agricultural workers in the countries of the South and nearly 2.5 billion people if we consider the families who live there directly (41% of the world population); (iv) Smaller "Less profitable": In agriculture, productivity is not proportional to the size of farms: the large size of farms is not always a factor of economy of scale.

II.1.3. Main Household Farms Financing Needs

The short-term financing needs of farm households relate to:

- The financing of the crop: inputs (seeds, fertilizers, pesticides), labor (land preparation, planting, weeding, harvesting), the land is taken into sharecropping;
- The financing of fattening (pig, sheep, goat, cattle) ;
- financing storage or processing of production^[1] ;
- Working capital of non-agricultural activities, when there is any

As for the medium-term (1 to 3 years) and long-term (> 3 years) agricultural financing needs of agricultural households, they relate to:

- Financing of equipment: for the intensification of production (harnessed cultivation, motor pump, small mechanization, etc.), the marketing of production (means of transport) or storage (buildings);
- Financing of infrastructure: storage warehouses, wells, boreholes, hydro-agricultural developments
- Financing of perennial crops requiring an initial investment for which the first returns on investments are not expected until after several years;
- The (re) constitution of herds, very critical in traditional breeding areas where the production apparatus has been destroyed by a climatic shock (Sahelian droughts);

- Access to land and its security;

The other types of financing needs of agricultural households relate to:

- The financing of the “lean” period;
- Needs linked to children's schooling and social obligations (baptisms, marriage, pilgrimage, redistribution, etc.);
- Access to domestic energy and for product processing needs;
- Health insurance;
- Insurance to face agricultural risks

II.2. Determinants of Access to Credit

Given the discussions on the credit market as well as the informational dysfunctions, it appears that there are a certain number of characteristics specific to the operators and their activities that are relevant in the decision of the banking institution to finance or not the financing credit requested. Several studies have been published on the factors determining access to credit. Three groups of factors can be distinguished from the existing literature on the subject. These factors are the financial environment, the terms and conditions of the loan imposed by the lending institutions, and the social and economic characteristics of the borrowers. Recent studies on the efficiency and effectiveness of financial markets in developing countries show that market imperfections largely contribute to the non-participation of many potential borrowers in the credit market. According to Foltz (2004) and Carter (1988), these imperfections include the capping of interest rates often imposed by governments, the monopoly situation often enjoyed by informal institutions especially in rural areas, the high transaction costs suffered by borrowers to express their requests. Also, the customer's morality sometimes constitutes an obstacle to access to credit (Gobezie, 2005). Regarding the second group of factors, Schmidt and Kropp (1987) have shown that the type of financial institution and its policy often determine access or not to credit. The duration of the credit, the terms of payment, and the security measures required when they do not correspond to the target groups lead them not to express a request or to systematic rejection by the institution if the request is made. Thus, according to Hossain (1988), the experience of the Grameen Bank shows that conditions imposed by formal credit institutions such as the requirement of collateral should not apply to small producers and the poorest in obtaining credit. The latter can use the loans and repay them if effective supervision and repayment conditions are in place. Regarding the third group of factors, most empirical studies have shown that age, farm income level, sources of income, farm assets, farm size, the mode of tenure of cultivated agricultural land, the gender, the level of education, the distance separating the borrower from the potential sources of credit, the history of the relationship between the institution and the individual, the belonging to a group, guarantees are all variables that influence access to credit. In this context, Ololade and Olagunju (2013) studied the determinants of farmers' access to credit in Oyo State in Nigeria. The results showed that factors such as gender, marital status, lack of collateral, and interest rate strongly influence the access to credit of farmers in the study area. According to the 2006 Microcredit Summit Campaign report, globally 84% of the poorest microfinance clients are women. Many credit programs reach an increasingly large population and a large number of women are beneficiaries (Mayout, 1998). However, other researchers believe that in microcredit women are always harmed (Everett & Savara, 1991; Goetz & Sen Gupta, 1996; Mayoux, 1995 cited

by Mayoux, 1998). Baydas et al. (1994) cited by Zidani and Jarboui (2011) showed that in Ecuador, women suffer more from microcredit rationing problems than men. These studies show that gender can influence access to credit, but on one side or the other, this influence can be positive or negative. Regarding the level of education, according to Adékambi et al. (2010), the level of education increases the actor's ability to make decisions after analyzing the information available at his level. Age is often used as an indicator of the maturity of individuals in decision-making processes (Rahman, 2003). However, some studies (Mohamed, 2003; Eze et al., 2009) have shown that the elderly are conservative and prefer to avoid debt situations. On the other hand, in his study Benarous (2004) shows that the evolution of decisions to grant loans between 1998 and 2002 shows an increasingly marked rejuvenation trend among applicants. Indeed, the age group between 18 and 39 years went from 75% in 2001 to 81% in 2002. He adds that the bank favors a young group of financed entrepreneurs. Spio (2002) found that the larger the household size, the lower the probability of borrowing for agricultural work given the availability of family labor. But a large household size does not mean a large number of working people. On the one hand, the greater the number of active persons (people of working age) in the household, the more family labor is available. On the other hand, the larger the size of the household, the higher the dependency ratio measured by the ratio of the number of inactive to the number of active persons in the household (Yabil, 2013). Guarantees are seen as mitigating elements of the adverse selection problem facing the lender (Stiglitz & Weiss, 1981; Bester, 1985; Chan & Kanatas, 1985; Besanko & Thakor, 1987 and Chan & Thakor (1987) cited by Diallo, 2006). Still for Diallo (2006), guarantees act as a signal allowing the lender to reduce or eliminate the problem of adverse selection caused by the existence of informational asymmetries between lenders and borrowers. The physical distance of farm households from formal credit institutions is one of the factors influencing access to credit. According to Hussein (2007), agricultural households are discouraged from seeking loans from institutions if the latter are far from their place of residence. For the author, this long distance generates temporal and monetary transaction costs (transport costs for example) and consequently increases the effective cost of credit. According to Kodjo et al. (2003), being a member of a peasant organization/structure or having a material guarantee makes it easier to obtain credit. Also, the results obtained by Avocevou (2003) show that in addition to the material guarantee, prior savings, and the provision of the guarantor, membership of a group constitutes one of the most important conditions of greater credit granting. Abdulai, Salakpi and Nassè (2021) emphasize that poor financial reporting practices can affect investors and other financial partners' willingness and trust to support institutions. For Agnikpé (1998) cited by Tchokpon (2003), regrouping into small groups in rural areas seems to give good results, especially in southern Benin. Thus, in group credit (Stiglitz, 1990 & Connig, 1996 cited by Fall, 2006) the joint surety is like a "social" guarantee. For Creusot (2002), the principle of joint surety requires that within a group of borrowers who have chosen themselves freely, all are responsible for the proper repayment of the entire group. Lanha (2001) for his part thinks that the pooled loan mechanism can be seen as a convenient solution to the problem of pre-contractual information, not only between the lender and the potential borrowers but also and also between them. The clients, taking the option of forming a solidarity group, know each other very well.

II.3. Credit Rationing

In the “endogenic” approach, credit rationing is analyzed from two angles. The first theory relating to the rationing of imbalance credit explains the mismatch between supply and demand by the existence of regulations that introduce rigidities or by a non-competitive organization of the banking sector (Keynes, 1930). According to Turgot (1766), three currents of ideas structure the axes of reflection on the theory of rationing of imbalance credit. Thus, first of all, the predominance of an adjustment between the quantities and the volume of credit distributed exerts a significant influence on the level of economic activity. Then, the imbalances between supply and demand for credit are explained by the existence of nominal rigidities which weigh on the setting of the interest rate. Finally, these rigidities are manifested by factors exogenous to the credit market, in particular. The second approach, which concerns the proponents of the equilibrium credit rationing theory, underlines the existence of imbalances even when the conditions for perfect competition are met due to causes endogenous to the credit market. Moreover, according to other analyzes of the endogenous bases of rationing in the credit market, the importance of the customer relationship attached to the decision to grant credit appears to be decisive (Hodgman, 1960). The lender's assessment of the risk on the trust that the latter places in the borrower is seen as the basis of this relationship. This relationship based on trust qualified here as the place for a trade-in promise is very decisive in the proper functioning of credit activity (Giraud, 2001). Other studies have looked at the rationing of credit, starting from the analysis of the strategies developed by the actors in play. This is a deductive approach that highlights the strategies implemented by companies to circumvent the problems and effects of credit rationing. These strategies are mainly based on reducing stocks, investments, cash holdings, dividends, and salaries paid. Companies can also increase their prices or resort to foreign currency credit. Thus, when the demand for credit is rationed, companies would reduce their spending. Only, they did not increase them subsequently during periods of excess credit supply. This leads to a kind of modeling of the behavior of rationed companies. The causal analysis of rationing in the credit market reveals, among other factors, the asymmetry of the information existing between banks and borrowers (Diarra, 2013). This factor in connection with adverse selection appears to be major determinants of credit rationing. Indeed, adverse selection characterizes situations where certain relevant information about the borrower's situation is not known to the lender. This information asymmetry leads to inefficient credit allocation and in particular to credit rationing phenomena. Indeed, the bank cannot charge too high-interest rates at the risk of having only bad borrowers as loan candidates. To reduce its risk, the bank prefers to limit the number of loans granted. This problem of adverse selection persists due to the poverty of individuals and small businesses, which can hardly provide adequate guarantees to the bank (Sami & Delorme, 2004). Anti-selection also appears to be an explanatory factor for credit rationing. This is a mechanism by which banks in risk screening manage to select the wrong risks. Indeed, the group of investors holding low-risk projects is subject to the same interest rates as the riskier ones. In conclusion, the less risky feel aggrieved, leaving the riskier investors alone in the market (Stiglitz & Weiss, 1981). Finally, the last determinant identified as a cause of credit rationing by Maystadt (2002) is moral hazard, which mainly penalizes small businesses. This factor which arises after the granting of credit appears when one party

to the transaction has to take action while the other party can neither observe, nor control, nor constrain the execution of the contract. It is the control of the use of the loaned amounts which is essential for the bank and this function has a significant cost. Furthermore, Chatterjee (2010) establishes the existence of an asymmetrical relationship between credit rationing and economic activity. The strength of this relationship is explained by the affection of economic agents for risk during periods of economic expansion. On the other hand, in the event of a slowdown in economic activity, banks show an excessive aversion to risk, which is overestimated. As a result, capital requirements increase, fueling credit rationing and reinforcing the dynamics of recession. Banks will therefore opt for a reduction in assets. The amount of the reduction will depend on the level of debt ratio that the bank wishes to maintain.

II. 4. Adaptation of Farms to the Credit Constraint

The notion of adaptation is a concept that derives its essence from the theory of evolution (Smit and Wandel, 2006). For Boudon (2002), adaptation is built concerning social adaptation and focuses on changes occurring at the level of the individual. The subject is never isolated from the groups in which he participates and the other (actor, situation, organization) is a stakeholder in adaptation scenarios (Simonet, 2009). In the adaptation process, there is therefore a reference model which makes it possible to pass from a usual functioning to a new functioning and a task to be accomplished which motivates the passage from one behavior to another. All this takes place in an environment whose modification triggers the adaptation process (Vieville, 2005). Based on this reflection by Vieville, we see that the adaptation process is triggered at the level of farms because of the financial environment presented to them by banks or MFIs. Adaptation being described as the mechanisms by which an individual becomes able to belong to a group; to be accepted, the individual must share the values, opinions, and attitudes of the group to some extent. Many experiments show that the opinions and attitudes of an individual depend on those of those around him. Strictly speaking, it is not a question of social influence, but rather of a complex mechanism by which the subject chooses between the objective reality and the social reality of the opinions of those around him. This conformism is because disagreement with the group represents a certain psychological cost and, in extreme cases, a certain risk of rejection. It is therefore submission to the principles of authority and conventions (Boudon, 2002). Furthermore, not all borrowers have the same adaptability. There is then a selection (whether natural or not) of potential individuals capable of accessing and obtaining credit. Caprio and Honohan (1991) explain that, in general, banks favor companies capable of providing financial statements, guarantees, and providing a minimum amount of capital. Thus, these authors highlight the empowerment or otherwise of certain social groups seeking credit. This empowerment is reflected in the accumulation of capital which would play a fundamental role in this dynamic of accessing and obtaining credit. The dynamics of the imbalances generated by the accumulation of capital - multiplier and accelerator - constitute one of the most characteristic aspects of the economic cycle (Diemer, 2012). It follows that the more difficult it is for borrowers to comply with the requirements of banks or financing structures, the more their access to credit is reduced. Always in their quest to adapt to the conditions imposed by the liquidity constraint on their farms, producers then seek adaptive responses which can either be individual or group. Thus, Lesaffre et al. (2002) think

that faced with this liquidity constraint to carry out agricultural activities, farms opt for a strategy of diversification of productive activities but also, more broadly, of income-generating activities with in front of them an instability of their crops and agricultural income. This strategy of diversifying the productive activities of their farms was confirmed by Kpadonou (2012) in his study on the impact of the credit constraint on income and production in the lower valley of Ouémé in Benin. According to him, diversification is one of the main approaches used to mitigate the effects of the credit constraint. Thus, farms then devote part of their time to para-agricultural and non-agricultural activities (fishing, breeding, rural exodus, transfer of funds, sale of animals, etc.), the income of which can be used to finance production plant (Kpadonou, 2012). HLPE (2013) believes that while making it possible to limit the credit constraint, diversification is an adaptation process that allows farmers to escape the poverty trap. Faced with the credit constraint, most producers also turn to the informal credit market to deal with their temporal liquidity problem (Diagne et al., 2000; Kpadonou, 2012). For Kpadonou (2012), this informal credit market offers producers the possibility of saving through the tontine system at zero interest rates; savings, which are then mobilized in the event of difficulty to finance agricultural activities. In addition to using the tontine, farmers make loans from usurers at very high interest rates (50 to 100%). Bellemare (2000) shows that when there is rationing of credit, an informal credit market is created, and potential borrowers (households or companies) turn in to obtain credit. This market can also be made up of relatives and friends of a potential borrower as well as local lenders operating outside the formal financial framework. Kalala (2007), for his part, asserts that rationing fuels the dependence of borrowers from several financial institutions. He believes that the credit granted does not cover the needs of borrowers, they are obliged to simultaneously resort to several sources of financing. We will no doubt speak of “multi-banking”. This informal strategy leads to social integration to a certain extent. Fink et al. (2014) showed in Zambia that there is a strong correlation between the availability of agricultural credit and the decision of producers to offer their labor outside their family farms. For these farms, it is always a question of making wage labor in order to earn money. This study therefore suggests the hiring of labor from farms as another form of adaptation of producers to the recurrent credit constraint. Kpadonou (2012) believes that another adaptation strategy for farms is the sale or rental of factors of production. Most of the time, this sale and rental concerns wage labor and the pledging of land. According to him, wage labor is a strategy implemented during periods of agricultural activity and which consists in selling one's labor force or that of family members in order to earn money which will then be invested in agricultural activities. Still according to Kpadonou (2012), pledging land is the last resort and this consists in leaving part of your property in use by another person for money and this for a given period. Banerjee, (2001), for his part, also thinks that in a situation of credit constraint, borrowers have recourse to other means such as residential property titles, durable goods (motorbike, furniture, post-stock harvest, etc.), and jewelry. In addition to these options, loan groups or clubs are also used. Sabai (2013) evokes social integration as a criterion of adaptation to the required conditions of access and obtaining credit. Indeed, in general, integration is considered as a “process allowing the active participation in national society of various and different elements, with equal rights and obligations” (Boucher, 2007). Indeed, it is sometimes observed that adaptive solutions

developed individually by farms can have limits. For Nassè and Sawadogo (2019) institutions should meet the core needs of their customers by providing them innovative and fair offers in the context. Consequently, group solutions or mechanisms are then recommended to alleviate the credit constraint somewhat. Ortmann et al. (2006), propose the creation of agricultural cooperatives which also appears to be an adaptation of producers for access to credit. However, it should be noted that the creation of groups and / or cooperatives is rather a satisfaction of the credit security requirements developed by financial institution.

Research Hypotheses

To achieve the set objectives, we assume that easy access to credit has favored a great diversity of cropping systems and an improvement in the level of prosperity of farms. Efficiency of access involves making available on time and the actual amount needed for the appropriate supply of inputs. The optimal use of quality inputs and in sufficient quantity, then induces a strong impact on the increase in yields. However, in an inappropriate financing system (delay, rationing and repayment difficulties, etc.), only farms which have palliatives for the delay and rationing of credit, can benefit from it. Whether making investments or using new inputs, cash availability is a major limiting factor for rural families. The adoption of innovations is therefore often conditioned by access to credit for the majority of family farms. Thus, two sub-hypotheses are to be verified during this research:

- *H1: The working capital needs of farms are greater than the amounts of loans granted by microfinance institutions.*
- *H2: There are structural, behavioral and farm performance factors that explain inequalities in access to credit for farms;*

EMPIRICAL FRAMEWORK

III.1. Data Collected and Organization of Surveys

The data used in this research come from a survey which covered a sample of 100 family farms. The survey took place in May-June 2020. The basic unit of our survey is the family farm in Burkina Faso. The identification of study areas and sites is made in a reasoned manner on the basis of the achievements of research, development projects and the establishment of Microfinance Institutions (MFIs). Thus, from the data available at the level of development projects and MFIs, municipalities have been identified due to the regular intervention of financing structures over the past five years. A stratification of the communes within the regions (Mouhoun, Cascades and North) was carried out and two rural communes per urban commune were chosen according to the participation of the populations in micro-credit activities, i.e. a total of 12 rural communities. As the microfinance institutions did not want to provide us with a list of their clients, we then took into account the population of agricultural households available in the survey area in order to be able to determine the size of our sample. Access to finance is the central theme of this study and according to UEMOA (2007)^[2], the probability of access to credit for the populations in Burkina Faso is 30 %. We then used the following formula to determine the size n of our sample with a probability of access to credit $p = 0.3$. Thus, the minimum size of the sample to be surveyed was determined with the following formula:

$$n = t^2 \times p \frac{(1-p)}{m^2}$$

n: Minimum sample size t: Confidence level (the standard value of the 95% confidence level will be 1.96) p: Probability of access to credit (in the case of our work this probability is 30 %) m: Margin of error (generally set at 5%) On the basis of this formula and for a probability of access to credit of 30 % and taking a margin of error of 5% with a confidence interval of 95%, the size of our sample to be investigated is 240 farms. Despite this size, the number of households to be surveyed per village was brought to a minimum average of 20 to ensure that the defined sample size was reached. In fact, the more the sample size increases, the more reliable the measured parameters are. Table 1 shows the results:

Table 1
Spatial Distribution of the Farms Surveyed

Regions	Urban communes	Rural communities	Number of farms surveyed
Mouhoun	Boromo	Bagassi,	20
		Fara	20
	Dédougou	Bondokuy	20
		Safane	20
Cascades	Niangoloko	Bérégadougou	20
		Mangodara	20
	Sindou	Douna	20
		Dakoro	20
North	Yako	Arbolé	20
		Samba	20
	Gourcy	Leba	20
		Tougo	20
Total	Sample size		240

Source: Fieldwork, 2018

The different information to be collected by the questionnaire relates to:

- the socio-economic characteristics of the respondents,
- the structure of family farms,
- the determinants of access to credit,
- the demand for credits by producers,
- the level of use of financial services,
- the management of agricultural credits,
- the conditions limiting or increasing access to credit,
- the repayment of agricultural credits,
- the types of collateral held,
- estimation of crop production from family farms,
- estimation of the production costs of family farms,
- the value of non-food crops and livestock,
- the dietary diversity of households on family farms, and
- the investment expenses of the operators.

The data collection in the field finished, all the files were collected and centralized and we then proceeded to the codification of the various files and to the preparation of the input mask. The data were then analyzed and entered into the Access 2010 software, which is a program for creating and managing databases, and then transferred to SPSS 20 for analyzes.

METHODOLOGY

To identify the determinants of access to credit for farms, logistic regression was used. Access to credit for farms is the phenomenon to be modeled. This decision is represented by a binary variable taking the value 1 if a farm has access to credit and the value 0 otherwise.

Our dependent variable representing access to credit is dichotomous. It can therefore only take two values (0, 1). The probability and the proportion of the variable are also between 0 and 1, as is the error term, which thus follow a discrete law (Bourbonnais, 2005). In this context, simple linear regression is not appropriate since it does not consider a maximum or minimum and it assumes the normality of the error terms (Pampel, 2000). Rather, a binary choice model should be used where one seeks to estimate the probability associated with an event. For Maddala (1985), Long (1997) and Magrini et al. (2010), in the most classic case of a choice model with two modalities (which is our case here, namely 0 for no access to credit and 1 for access), the estimation of the probability of the occurrence of the considered alternative is done by a binary *probit* or *logit model*. On the other hand, if several alternatives are possible, without a predefined order, it is advisable to jointly estimate the probability of each alternative with respect to an alternative taken as a reference. The econometric model required in this case is then a *multinomial* of the *logit* or *probit* type according to the distribution law retained on the error terms.

Suppose A_i a binary variable showing the access or non-access to IMF for agricultural exploitation i ($i = 1, \dots, N$) $A_i = 1$ if access and 0 if not A_i^* .

with and a latent variable associated with A_i . This latent variable is a function of a matrix of explanatory variables x_{ij} translated into equation (1):

Or a binary variable indicating access or not to credit from MFIs for a farm

$$A_i^* = \alpha + \sum_{j=1}^J \beta_j X_{ij} + \varepsilon_i \quad (1) \quad \text{Where}$$

is a random term whose distribution is given by the density function f

$$(2) \quad \begin{cases} A_i = 1 & \text{si } A_i^* > 0 \\ A_i = 0 & \text{si } A_i^* \leq 0 \end{cases}$$

By replacing (1) in (2), we get:

$$P(A_i = 1) = P\left[\varepsilon_i > -\left(\alpha + \sum_{j=1}^J \beta_j X_{ij}\right)\right] = P\left[-\varepsilon_i \leq \left(\alpha + \sum_{j=1}^J \beta_j X_{ij}\right)\right] = F\left[\alpha + \sum_{j=1}^J \beta_j X_{ij}\right] \quad (3)$$

Where F is the distribution function corresponding to the density function f .

Depending on the nature of the distribution of f which can be normal or logistic, the estimation of equation (3) is made by a binomial *probit* model or a binomial *logit*. It is this latter model that was retained in this study for three reasons:

- The explained variable (access or not to credit) used in our study is qualitative and dichotomous.

- When the explanatory variables are not normally distributed, the estimators of the *logit* model are more robust than those obtained by discriminant analysis (Tapsoba, 2007; Yabile, 2013).
- The models *logit* allow simple calculations. In addition, Gouriéroux (1989) cited by Yabile (2013), using the Monte-Carlo method, shows that the parameter estimates and their precision obtained by *probit* models are generally not very different from *logit* models. Thus, the *logit* model to be estimated can be specified as follows:

$$\ln \left(\frac{P(A_i)}{1 - P(A_i)} \right) = \alpha + \sum_{j=1}^j \beta_j X_{ij} + \varepsilon_i$$

Where

x_{ij} represents the matrix of explanatory variables, β_j the coefficients to be estimated and ε_i the error term is the constant term. Since the data used in this study were collected over a single period, the binomial *logit* regression model was used to examine the determinants of this decision. The empirical estimation of the presented model was made on the basis of a certain number of assumptions. These assumptions are presented through the variables included in the specification.

- *Sex*: Gender is a variable commonly used as an independent variable in this type of model. The sign of the gender coefficient can then indicate the presence or not of discrimination against women in access to agricultural loans granted by MFIs.
- *Instruction*: Here, there is a hope for a positive influence of the instruction on the decision of the MFI to grant credit to the producer.
- *Age*: One can assume a positive correlation between age and the possibility of producers' access to credits offered by MFIs. The square of this variable is also included in the model in order to test for the presence of non-linear effects between age and the decision to access credit and to control for threshold effects. Also, the square of age makes it possible to capture the effect of old age on access to microcredit and to see whether age has an indefinite positive effect on access to microcredit. Here, we expect a negative sign for this variable which would show that there is an optimal age at which the probability of obtaining credit is the highest.
- *Household size*: Household size is often used as an indicator of labor availability on a farm. It is assumed here that there is a negative correlation between household size and access to credit. Indeed, we assume a negative influence of the availability of labor on the demand for credit.
- *Marital status*: This variable is also often used as an indicator of maturity in the management of a farm, or even of a loan. Indeed, it is believed that a married operator is more responsible than a single person. We assume a positive influence of this variable on access to credit.

- *Membership of a financial solidarity group:* Belonging to a solidarity group is supposed to increase the farmer's chances of access to credit. Here, a positive sign is expected.
- *Production of cash crops, income and training:* A production of cash crops, income and training by an MFI on credit management positively influences the decision to grant credit by MFIs. All these variables are supposed to increase the guarantee of repayment of the credit by the farmer. The first two offer financial guarantees on the repayment capacity while the last relates to the managerial capacity of the producer.
- *Existence of an MFI in the locality:* This variable indicates physical accessibility or proximity to the financial institution, which positively influences demand.
- *Existence of guarantee:* Real guarantees are the forms most required by the institution for granting credit. These are requested for almost all credits. This variable significantly increases the probability of granting credit by MFIs.

Before the specification and estimation of the model, a systematic analysis of the partial correlation coefficients of the explanatory variables was carried out to identify possible multi-collinearity problems. The correlation matrix showed that none of these coefficients were high (significantly less than 0.8) for the variables included in the model except for age and age squared. It is therefore hoped that the estimates do not suffer from multi-collinearity problems. Thus, the analysis of the determinants of access to credit was made on the basis of a mixed approach combining both the qualitative method and the econometric method. Based on primary data collected at the level of the entire sample, the binomial *logit* regression model was used to examine the determinants of access to agricultural credit.

RESULTS AND DISCUSSION

IV. 1. Descriptive Statistics of the Variables Used in the Model

The descriptive statistics of the different variables included in the model are presented in Table 2. The descriptive analysis of the explanatory variables shows that in the group of farms without access to credit, there are about 10% that are managed by women versus 90% headed by men. The proportions of farms with married heads do not vary significantly depending on access to credit. As for the level of education, it is found that 52% without a formal level of education among the farmers who have had access to credit. Of those farms that could not access credit, over 65% did not receive formal education. The literacy level of farmers does not vary significantly depending on access to credit. In fact, in the group of operators who had access, approximately 77% are not literate. Of those who could not access credit, 78% were not literate. These figures show that in the context of Benin, literacy programs are not accessible to all regions. Not everyone can read and write in their national language. In the survey areas, most of the farmers who had access to credit belong to a financial solidarity group also called the solidarity guarantee group (82%). Of those who belong to the joint surety group, 90% have had access to credit. On the other hand, among the farmers who did not have access to credit, about 62% belong to a financial solidarity group. Is proximity to an MFI a condition of access to credit? In fact, more than half (52%) of farmers believe that they are not close to an MFI. However, 50% of farms that do not have an MFI nearby have had access to credit. The average age of family farmers is 40 years with an average experience in agricultural production of 20 years. If there is no significant difference for the age of the operators, there is one in terms of experience. Thus, the average age at the

level of farmers who had access to credit is 44 years against 45 years for farms whose credit has been refused. With regard to experience in agricultural production, the number of years is on average 21 years for farmers who have had access to credit and 25 years for those who have not.

Households on farms are made up on average of 11 people overall. But there is a significant difference between the size of households. Thus, the size of households having had access to credit is on average 10 people and that of households without access on average 14 people. In both cases, we note that the dependency ratios are not significant. These dependency ratios are around 48% for farms that have had access to credit and 43% for farmers who have not had access. The average farm income is around 822,838 FCFA. It is in fact 905,038 FCFA for farmers who have had access to credit against an average of 306,150 FCFA for those who have not had access. The size of holdings varies significantly depending on whether the household has access to credit or not: respectively 10.6 ha and 7.5 ha for holdings that had access and those that did not. On the other hand, the results of the Student test show that there is no significant variation between those who have access to credit and those who do not from the point of view of average income. However, the variation in Student's t (1.4491) suggests in the medium term that if actions are intensified in order to provide farmers with access to credit, their income will be improved. For the available area and the dependency ratio the statistical analyzes did not reveal any significant difference.

Table 2

Descriptive Statistics of the Explanatory Variables Used

<i>Variables</i>	<i>No access to credit Access to credit</i>		<i>Statistical test</i>
Gender (% of men)	84.13	91.02	2.9116 *
Marital status (% of married people)	93.65	96.60	1.3053
Formal education (% of yes)	34.92	48.30	3.9322 **
Literacy (% of yes)	31.75	32.77	.0259
Membership of a financial solidarity group (% of yes)	61.90	82.28	13.9617 ***
Existence of an MFI (% of yes)	31.75	50.73	7.8859 ***
Training by an MFI (% of yes)	36.51	30.58	.8912
Existence of guarantee	98.41	97.09	.3606
Age (standard deviation)	45.01 (1.53)	43.90 (.56)	.7105
Number of years of experience	25 (1.48)	21.44 (.53)	2.3814 **
Household size	13.41 (1.06)	10.41 (.30)	3.3979 ***
Returned	306,150.80 (29,875.05)	905,038.80 (164,615.50)	1.4491
Available area	7.52 (.98)	10.63 (.69)	1.70
Dependency ratio	.42 (.03)	.47 (.01)	1.44

Pearson's chi-square test was used for the % variables and Student's t is presented for the quantitative variables.

*** ($p < .01$); ** ($p < .05$); * ($p < .10$). (Source: Fieldwork, 2018)

IV.2. The Determinants of Credit Access EXPLOITA of Agricultural Holdings

This sub-section deals with the validation and quality of the prediction and the identification of the determinants of access to credit for farms and the interpretation of marginal effects. It should be noted that the sample is not divided equally between the holdings which had access and those which did not. The Wald statistic was used to test the null hypothesis that all the coefficients were simultaneously equal to zero. The results of this test show that the model is globally significant at the 1% level. The result of the Hosmer-Leshmshow goodness-of-fit test and the area under the ROC curve indicate that the model is generally acceptable. Figure 1

presents the evaluation curve of the predictive quality of the model. The results show (Table 3) that the model correctly predicts the situation of access to credit for family farms in 72% of cases.

Figure 1- Evaluation curve of the predictive quality of the model (source: Fieldwork, 2020)

Examination of the correlation matrices shows that no critical correlation is found between the continuous and qualitative independent variables. Indeed, all the correlation coefficients are appreciably less than 0.8 (see table in the appendix) which corresponds to the limit proposed by Kennedy (1985) cited by Kacem and Zaouaril (2013) and from which we generally start to have serious multi-collinearity issues in the regression model. Table 3 presents the results of the analysis of the determinants of access to agricultural credit for MFIs by producers in Burkina Faso. The analysis of the individual coefficients of the variables shows that the main determinants of access to loans granted by MFIs to farmers in Burkina Faso are i) the size of households, ii) membership of a financial solidarity group, iii) the existence of an MFI in the immediate environment and iv) income.

Table 3
Results of the Logit Model for Analyzing the Determinants of Access to Credit

<i>Variables</i>	<i>Coefficient</i>	<i>Robust standard errors</i>	<i>z</i>	<i>P > z [95% Conf.]</i>
KIND	.1493428	.4856355	.31	.758 - .8024853
MATRI	.7050975	.7027899	1	.316 - .6723454
AGE	.0807044	.0604331	1.34	.182 - .0377423
AGE ²	-.0008014	.0006322	-1.27	.205 - .0020404
SIZE	-.0650782 ***	.018886	-3.45	.001 - .102094
CULTR	-.3153114	.2861656	-1.1	.271 - .8761856
GRPMT	.7377008 **	.3401458	2.17	.03 - .0710273
EDUC	.3923477	.3063046	1.28	.2 - .2079984
MFI	.5533518 *	.3001267	1.84	.065 - .0348858

FORM	-.4640558	.3065935	-1.51	.13	-1.064968
REVENUE	.000000965 ***	3.21E-07	3	.003	.000000335
GUARANTEE	.4170656	1.167633	.36	.721	-1.705583
SUP	.0073916	.013126	-.56	.573	.0331182
RDEP	-.137403	.6338801	-.22	.828	-1.379785
Constant	-.5775797	1.508703	-.38	.702	-3.534584
Wald Chi-square (dof)	42.51 (14) ***				
Nickname R2	.1179				
Area under the curve ROC	.7247				
Number observations	459				

*** significant at the 1% level ($p < .01$); ** significant at the 5% level ($p < .05$); * significant at the 10% level ($p < .10$). (Source: Fiedlwork, 2011)

The econometric results show that the sex variable is not significant. Thus, the fact of being a man or a woman has no influence on the access to credit. This result is not in agreement with the literature which considers that gender has a considerable effect on access to credit (Morduch, 1999 cited by Kacem & Zouali, 2013). Also, this result is contrary to studies which believe that women are disadvantaged in accessing financial services (Everett & Savara, 1991; Goetz & Sen Gupta, 1996; Mayoux, 1995a cited by Mayoux, 1998). This result demonstrates the absence of discrimination between men and women for access to credit at the level of microfinance institutions. The same is true for the marital status variable, which although having a positive coefficient is not significant. Thus, being married has no impact on access to credit from MFIs. The estimation of the coefficient of the logit model shows that the variable age of the farmer is not significant but has a positive coefficient as expected. This result shows that the financing institutions prefer to lend to the oldest or even the most experienced operators. The age squared variable has a negative coefficient, which denotes that there is an optimal age at which the probability of obtaining credit is highest. The instruction variable has the expected sign and shows that the more educated a farmer is, the more likely he is to obtain credits. This result confirms those of Evans *et al.* (1999), who demonstrated that low education influences the decision to grant credit at the level of microfinance institutions. However, descriptive statistics show that among farmers who have had access to credit, the uneducated category dominates (52%). This could be explained by the nature and specificity of the sector of activity which is the agricultural sector which employs the most people in Burkina Faso and the most dropouts and uneducated people. In general, and regardless of the level of education, the loan applicant has the possibility of having his file accepted by the institutions (Kacem & Zouaril, 2013). In the access to microcredits, the size of the household is a factor which does not favor the farmer. Indeed, the coefficient of the "household size" variable (significance level 1%) is, as expected, negative. Thus, the larger the household size, the less likely the farm is to have access to credit. The explanation for this negative correlation comes from Foltz (2004) and Eze *et al.* (2009), who showed that the size of the household influences the demand for credit much more than its satisfaction by the MFI. However, the formulation of the request is a *sine qua non* condition for access. As for the dependency ratio, the estimate shows that it is not significant and has a negative sign. We could then say that the higher this ratio, the lower the chance for the farm to have access to credit. Membership of a financial solidarity group has a positive influence on access to microcredits. Analysis of the coefficient of this factor shows that it is preponderant in access to microcredits (+ .74). Membership of an association also

appears to be a relevant determinant since the probability of granting credit is higher for applicants who are members of a financial solidarity group for non-members. These results agree with those obtained by Abalo (2007) in his study on microenterprises in Togo. Fall (2006) also considers that belonging to a group is a major obstacle to credit if this group is a debtor. According to him, this is the first conditionality for obtaining credit. In reality, credit is not individual from the point of view of the bank, which in practice only recognizes the group. Thus, the debtor producer is perceived on the side of the group as a bad payer and constitutes a constraint in obtaining credit for the group (Fall, 2006). Income also has a positive effect on access to microcredit and is significant at the 1% level. In other words, when the income is high, the probability of obtaining the credit is high. Thus, an operator with unstable income is not fortunate enough to have access to financial services. Indeed, excessively unstable incomes do not allow people to be able to obtain financial products (Kempson et al., 2000; Beck & De la Torre, 2004; Honohan, 2005; Claessens, 2006; IMCE, 2006; World Bank, 2008; Beck & Demirgüç-Kunt, 2008; Demirgüç-Kunt & Levine, 2008; Beck et al., 2009; Ramji, 2009 cited by Bélisle, 2012). To better appreciate the effect of the explanatory variables on the probability of access to credit, we calculated the marginal effects of the variables included in the model. The results of this calculation are shown in table 4.

Table 4
Marginal Effects of Explanatory Variables

<i>Variables</i>	<i>Coefficient</i>	<i>Standard errors</i>	<i>z</i>	<i>P> z</i>	<i>[95% Confidence interval]</i>	
<i>KIND</i>	.01	.04	.29	.77	-.07	.09
<i>MATRI</i>	.07	.09	.80	.42	-.10	.24
<i>AGE</i>	.01	.00	1.33	.19	.00	.02
<i>AGE2</i>	.00	.00	-1.25	.21	.00	.00
<i>SIZE</i>	-4.95 E-3 ***	.00	-3.39	.00	-.01	.00
<i>CULTR</i>	-.02	.02	-1.07	.28	-.07	.02
<i>GRPMT</i>	.06 *	.04	1.77	.08	-.01	.14
<i>EDUC</i>	.03	.02	1.31	.19	-.01	.07
<i>MFI</i>	.04 *	.02	1.93	.05	.00	.08
<i>FORM</i>	-.04	.03	-1.40	.16	-.09	.02
<i>REVENUE</i>	7.35 E-8 ***	.00	3.91	.00	.00	.00
<i>GUARANTEE</i>	-.03	.06	-.42	.67	-.15	.10
<i>SUP</i>	.00	.00	-.57	.57	.00	.00
<i>RDEP</i>	-.01	.05	-.22	.83	-.11	.08

*** (p < .01); ** (p < .05); * (p < .10).Source: Fieldwork (2020).

The results of the calculation of the marginal effects show that the marital status variable is affected by a coefficient whose estimator has a positive realization. Thus, being married increases the probability of access to credit from microfinance institutions by nearly 7%. Being male increases the likelihood of operators of accessing financial services by just 1%. The results also show that the fact that a farmer is a member of a financial solidarity group increases by about 7% his chances of having access to credit. The same is true for more educated operators. Indeed, a high level of education would increase the probability of access to credit by 3%. With regard to the variable existence of a microfinance institution, it is assigned a positive coefficient, which shows that the existence of a microfinance institution in the immediate environment of farmers increases the probability of having 4% credit

access. On the other hand, the probability of access to credit decreases by 2% when we practice cash crops. Indeed, in addition to cotton, which is in decline and whose arrears to producers follow one another, other cash crops are perennial crops that are difficult to finance for microfinance institutions. Also, not receiving training on the development of micro-projects from NGOs, MFIs or state services reduces the probability of access to credit by 4%. This agrees with the statements of respondents who believe that training is an important condition in access to credit. The probability of access is also reduced when the size of the household and the dependency ratio are high.

CONCLUSIONS

For Sabogu, Nassè, and Osumanu (2020) food security in the West African context is a mean to fight conflicts. For Nassè (2011) food security is capital to eradicate starvation and migration. To improve food security in the various geographical areas of Burkina Faso, it is imperative to increase the level of profitability of agricultural production. This profitability involves improving the level of use of quality inputs (seeds, specific fertilizers in particular), intensifying the mechanization of cropping operations and the practice of a policy of regulating agricultural markets in the face of product prices. This would increase the performance level of farms. As one of the constraints linked to the optimal use of factors of production is credit, we recommend the following to improve the financing conditions of farms and the standard of living of producers. The effective establishment of the National Bank for Agricultural Development as there is no longer a banking institution specializing in agriculture. However, the establishment of this instrument in Burkina requires preconditions to be taken into account for its sustainability. Indeed, agricultural banks being public structures are very often marked by certain abuses. This is why it is necessary to avoid adopting:

- i) very low interest rates applied by these structures and which do not allow financial service providers to cover their costs,
- ii) low or high repayment rates default rate which is due to the low profitability of speculations and to the confusion between loans and grants, and finally, iii) poor governance on the part of the managers and agents of the structures. Also, the BNDA could implement the principle of progressive credit (credit ceilings increase from one cycle to another) allowing the selection over time of good borrowers and introducing a strong incentive to repay, and which is noted as an innovation that can facilitate appropriate and sustainable financing of the Beninese agricultural sector. In the absence of adequate resources, solid guarantees and expertise for the investigation of agricultural files, the financing institutions are losing interest. It is therefore important that the establishment of the National Agricultural Development Fund (FNDA) is a reality. For a real investment in the agricultural sector, this fund will have to base its actions on building the capacities of financing structures in order to make them more able to provide suitable financial products. Also, this fund should make it possible to strengthen the capacities of producers in the management of agricultural operations in general and credit in particular (keeping of books of accounts, size of reimbursement, etc.). It is also important that the FNDA has financial instruments for securing financial institutions likely to invest in the financing of agriculture such as an interest rate subsidy window, a credit guarantee window, a Shared-cost fund window, etc. Like the National Bank for Agricultural Development (BNDA), the FNDA

should aim for the viability of these actions in the field. Thus, while taking into account the errors made by similar structures in several countries of the West African sub-region, the FNDA should avoid direct financing from grassroots producers. This will make it possible to avoid the total misunderstanding of “Loan = Don” generated by the perceptions that producers have of the interventions of state structures in the financing of the agricultural sector. It is important that qualified microfinance structures in good standing with the regulations be associated in order to ensure perfect intermediation between the FNDA and the producers. Also, the FNDA will have to take into account the interest rate subsidy while respecting national standards and practices. For this structure of power in a perennial and sustainable way, it will be a question of making the financing requests of the producers solvent, financing adapted to each speculation (the gross margins varying according to the crops) while respecting the cycles of culture. Encourage beneficiary savings in the form of warrantee in order on the one hand to allow financing institutions to recover the loans granted on time and reduce their dependence on subsidies and on the other hand to allow farmers to 'self-finance with their own savings. This will also make it possible to avoid rationing situations caused by the quality of the available portfolio. Although warrantee in Benin is currently highly appreciated because of its "novelty" and its effectiveness in terms of access to financial services for farmers, it is necessary to take into account in practice the limits and obstacles that may hinder the implementation of the mechanism. Thus, to ensure the smooth running of the process, it would be necessary to control the prices on the markets. In other words, it will be a question of avoiding the depreciation of the stock due to the speculation of certain wholesalers. This measure should therefore be supported by the establishment of a reliable market information system. In addition, it is necessary to ensure the involvement of organized and viable microfinance institutions. Indeed, the limits of warrantee also lie in the financing capacities of microfinance structures because the financial volumes available for loans often remain very low. Make the Agricultural Mutual Insurance of Burkina functional and support it in covering agricultural risks. Although important, to be sustainable, this insurance structure must take into account the seasonality of disasters and the extent of the damage to be taken into account. In other words, it must above all take into account uncertainties such as epidemics (with regard to farm animals), the invasion of grasshoppers and locusts, climate change, etc. in the appreciation and assessment of damage observed at farm level.

The theoretical and practical contributions of this research are as follows:

Research has shown that the problem of financing a strategic sector such as agriculture in a developing country still remains unanswered. Indeed, the means put in place by the State are so insufficient and badly oriented that they do not manage to allow an effective development of agriculture. However, this sector is a pioneer in terms of contribution to gross domestic product (35%). Traditional banks having shown their inability to finance agriculture, producers are left to the goodwill of microfinance institutions. This paper shows that there are disparities from one region to another. In fact, farmers in the North operate larger areas with higher production costs; which then implies more financing needs for their activities. It also shows us that the financing structures are too remote from the populations, which does not allow them easy access to information; source of increased transaction costs. The results of

this work also show that farms that have access to extension services have faster access to credit opportunities.

References

- Abalo, K. (2007). Importance de la microfinance dans le financement des micro-entreprises au Togo. *African Economic Conference 2007 "Opportunities and Challenges of Development for Africa in the Global Arena", Addis-Abeba, Ethiopia, 15-17 November 2007.*
- Adégbola, P. Y. (2009). *Typologie des exploitations agricoles dans les vallées du Bénin.* Rapport d'étude.
- Adégbola, P. Y., Arouna, A., Ahoyo, N., Olou, D., Hounhinto, A., & Adékambi, S. (2011). *Identification et analyse des mécanismes efficaces de remboursement de crédits sur vivriers au Bénin.* Rapport d'étude. APRA/INRAB.
- Adekambi, S. A., Adegbola, P.Y., & Arouna, A. (2010). Perception paysanne et adoption des biopesticides et/ou extraits botaniques en production maraîchère au Bénin. *3th African Association of Agricultural Economists (AAAE) and 48th Agricultural Economists Association of South Africa (AEASA) Conference, Cape Town, South Africa, September 19-23, 2010.*
- Abdulai, I., Salakpi, A., & Nassè, T. B. (2021). Internal audit and quality of financial reporting in the public sector: the case of University for Development Studies. *Finance & Accounting Research Journal*, 3(1), 1-23.
- Azocli, R. (2010). *Les innovations réussies en matière de recouvrement des impayés.* Afraca, CBC, FIDA. Bénin. Novembre 2010.
- Bandé, R., & Nassè, T. B. (2020). Development communication and performance in the projects of low-income countries: The case of the Regional Support Project for Pastoralism in the Sahel (PRAPS) in Niger. *International Journal of Management & Entrepreneurship Research* 2(5), 380-390
- Banerjee, A. (2001). *Contracting constraints, credit markets and economic development.* Working Paper Series, 02-17. Cambridge, USA: Massachusetts Institute of Technology, Department of Economics.
- Bangoura, L. (2010). *Contrat de crédit, risque moral, sélection adverse et incitation à l'effort pour le remboursement en microfinance.* Besançon, France: Centre de Recherche sur les Stratégies Economiques (CRESE).
- BCEAO (2011). L'état du système bancaire au Bénin et ses vulnérabilités à l'égard des crises. *Séminaire régional sur le thème « Gestion des crises bancaires et politiques de restructuration », Dakar, Sénégal, 18-22 avril 2011.*
- Bélisle, M. (2012). *Accessibilité financière des individus et rôle de la microfinance au Ghana et en Tanzanie.* Mémoire: École des Hautes Études Commerciales, Université de Montréal (Canada).
- Bellemare, M. (2000). *Une évaluation empirique des contraintes de crédit au Maroc urbain : une application de divers modèles de choix discret au cas des micro-entreprises de Casablanca.* Mémoire : Université de Montréal (Canada).
- Benarous, M. (2004). *La Banque Tunisienne de Solidarité : solidaire pas caritative.* Limoges, LI : *Laboratoire d'Analyse et de Perspectives Economiques (LAPE).*

- CEREG (2012). *Inventaire des mécanismes de financement des activités agricoles au Bénin*. Rapport final.
- Chatterjee, S. (2010). De-leveraging and the financial accelerator: how all street can shock main street. *Business Review*, Q2, 1-8.
- Creusot, A-C. (2001). Présentation de l'outil d'évaluation des performances CAMEL. *BIM*, (138/6 novembre 2001).
- Desharnais, R. (2010). *Tout est une question de crédibilité, un mode d'emploi pour tous*. Mariville, Canada: Les Éditeurs Réunis.
- Développement International Desjardins (DID) (2010). *Financement agricole : un puissant outil de contribution à la sécurité alimentaire des populations*. Lévis, Québec: DID. 24 p.
- Diarra, L. (2013). *Analyse de l'impact de la régulation sur la prise de risque par les banques*. Mémoire : Faculté des Sciences économiques et de gestion, Université du Sud Toulon Var (France).
- Diemer, A. (2012). *Cours de: Economie – Gestion*. IUFM AUVERGNE. Préparation: CAPET, PLP.
- Everett, J. & M. Savara, (1991). "Institutional credit as a strategy toward self-reliance for petty commodity producers in india: A critical evaluation", in Afshar, op. cit. pp. 239-259.
- Eze, C.C., Ibekwe, U.C. & Korie, O.C. (2009). Women's accessibility to credit from selected commercial banks for poverty reduction in South East Nigeria. *17th International Farm Management Congress, Bloomington/Normal, Illinois, USA, July 2009*.
- Fall, A. A. (2006). *Impact du crédit sur le revenu des riziculteurs de la vallée du fleuve Sénégal*. Thèse de doctorat : Ecole Nationale Supérieure Agronomique de Montpellier (France).
- FAO (2008). *Microfinance et financement des exploitations agricoles : existe-t-il une connexion ?* Programme de formation aux politiques de la FAO. Module EASYPol n° 135. Rome: FAO.
- Fink, G., Kelsey Jack, B., & Masiye F. (2014). *Seasonal credit constraints and agricultural labor supply: evidence from Zambia*. NBER Working Paper No 20218. Cambridge, USA: National Bureau of Economic Research.
- Foltz, J.D. (2004). Credit market access and profitability in Tunisian Agriculture. *Journal of the International Association of Agricultural Economists*, 30(3), 229-240.
- GENDERNET (2011). *L'autonomisation économique des femmes: document de réflexion. Réseau du CAD sur l'égalité hommes-femmes*. Paris: OCDE.
- Gentil, D. (2001). *Le financement des exploitations agricoles dans les pays en développement. Synthèse des groupes de travail (1999-2000). Débats et controverses*. Paris: Inter-réseaux- Développement rural.
- Giraud, P. N. (2001). *Le commerce des promesses. Petit traité sur la finance moderne*. Paris: Seuil.
- Goetz, A. M., & Gupta, R. S. (1996). Who takes the credit? Gender, power, and control over loan use in rural credit programs in Bangladesh. *World Development*, 24(1), 45-63.

- Helms, B. (2006). *Access for all: building inclusive financial systems. Capturing 10 years of CGAP experience*. Washington D.C.: The International Bank for Reconstruction and Development/World Bank.
- Koutche, K. (2012). Fonds national de la microfinance au Bénin : états des lieux et perspectives. *Colloque national sur la microfinance en Côte d'Ivoire, Abidjan, Côte d'Ivoire, 29-30 octobre 2012*.
- Kpadonou, B. R. A. (2012). *Impact de la contrainte de crédit sur la production et le revenu agricoles : une analyse par la programmation stochastique discrète des exploitations agricoles de la basse vallée de l'Ouémé*. Mémoire : Université de Parakou (Bénin). 166 p.
- Mayoux, L. (1998). *L'empowerment des femmes contre la viabilité ? Vers un nouveau paradigme dans les programmes de micro-crédit*. In : Preiswerk Y., éd. *Les silences pudiques de l'économie : économie et rapports sociaux entre hommes et femmes*. Berne, BE: Institut Universitaire d'Études du Développement/Unesco.
- Mbouombouo Mfossa, P. H., Mvogo, G., & Ndzana, M. (2013). Performance sociale versus performance financière : quel objectif pour les microfinances camerounaises ? *Vèmes Journées Internationales de la Microfinance « Mutations et crises de la microfinance »*, Douala, Cameroun, 11, 12 et 13 septembre 2013.
- Mohamed, K. (2003). *Access to formal and quasi-formal credit by smallholder farmers and artisanal fishermen: a case of Zanzibar. Research on poverty alleviation (REPOA), Research Report No. 03.6*. Dar es Salaam, DES: Mkuki na Nyota.
- Montcho, S. (2014). *Dimensions socio-culturelles de l'empowerment des femmes bénéficiaires de microcrédits dans l'arrondissement d'Adjohoun-Centre*. Mémoire de Diplôme d'Etude Approfondie : Université d'Abomey-Calavi (Bénin).
- Nanéma, M., Nassè, T.B., & Ouédraogo, A. (2021). Examining the different factors of the mid-term performance of development projects in very poor countries. *International Journal of Management & Entrepreneurship Research*, 3(2), 30-44
- Nassè, T. B. (2011). *Kasim Borrowings from English: An evidence from Burkina Faso*. Saarbrücken, SA: Lambert Academic Publishing.
- Nassè, T. B. (2012). *Succeeding in Church missionarial work in West Africa: The necessity of understanding the West African environment*. Saarbrücken, SA: Lambert Academic Publishing.
- Nassè, T. B., & Sawadogo, Y. M. (2019). Internal equity and customer relationship management in subsistence markets: a comparative and a qualitative study of three private companies in Burkina Faso. *International Journal of Management & Entrepreneurship Research* 1(1), 42-58.
- Ololade, R.A. & Olagunju F.I. (2013). Determinants of access to credit among rural farmers in Oyo State, Nigeria. *Global Journal of Science Frontier Research Agriculture and Veterinary Sciences*, 13, 1-7.
- OXFAM (2012). *Etude de cas sur l'accès au crédit des petits producteurs/productrices de maïs et de riz et des femmes étuveuses de riz*. Oxfam International.
- PAM (2014). *Analyse globale de la vulnérabilité, de la sécurité alimentaire et nutritionnelle*. Paris: Programme Alimentaire Mondial. 146 p. pauvrete15716.html. (18/02/2014).

- Rahman, S. (2003). *Resource Use Efficiency with Self-Selectivity: An Application of a Switching Regression Framework to Stochastic Frontier Models*. The School of Economics Discussion Paper Series 0301. Manchester, US: University of Manchester.
- Sabogu, A., Nassè, T. B., & Osumanu, I. K. (2020). Land conflicts and food security in Africa: An evidence from Dorimon in Ghana. *International Journal of Management & Entrepreneurship Research*, 2(2), 74-96.
- Sami, H., & Delorme, A. (2004). *Diffusion d'information et risque de crédit dans les économies émergentes*. 21 p. <http://www.aed.auf.org/IMG/pdf/H.Sami.pdf>
- Spio, K. (2002). *The impact and accessibility of agricultural credit: a case study of smallscale farmers in the Northern Province of South Africa* (PhD Thesis), University of Pretoria, South Africa.
- Tapsoba, D. H. (2007). *Une estimation du choix des consommateurs canadiens en matière de véhicules personnels, de nouvelles technologies et de carburants de remplacement par Logit mixte*. Mémoire de maîtrise: Université de Laval (Canada).
- Tchokpon, A. N. (2003). *Sélection adverse dans la consommation des microcrédits par les groupes de prêts*. Mémoire : Université d'Abomey Calavi (Bénin).
- Wampfler, B., & Lapenu, C. (2002). *La microfinance au service de l'agriculture familiale. Résumé exécutif du Séminaire international « Le financement de l'agriculture familiale dans le contexte de libéralisation : quelle contribution de la microfinance ? » Dakar, Sénégal, 21-24 janvier 2002*. Montpellier : Cirad.
- Wampfler, B., & Mercoiret, M. R. (2002). Microfinance, organisations paysannes : quel partage des rôles, quels partenariats dans un contexte de libéralisation ? In : Wampfler, B., Lapenu, C. & Roesch, M., eds. *Le financement de l'agriculture familiale dans le contexte de libéralisation : quelle contribution de la microfinance. Actes du Séminaire international, Dakar, Sénégal, 21-24 janvier 2002*. Montpellier : Cirad/Cerise.
- Wampfler, B. (2004a). *Les conventions de microfinance, un outil de développement socialement durable ? Une approche institutionnelle*. Synthèse des travaux de recherche présentée en vue d'obtenir l'Habilitation à Diriger des Recherches (HDR) : Université de Versailles Saint Quentin en Yvelines (France).
- Wampfler, B. (2004b). Financement de la traction animale dans le contexte du désengagement du Sénégal. *Revue d'Elevage et de Médecine vétérinaire des pays tropicaux*, 57(34), 211-217.
- Wampfler, B. (2004c). Face au désengagement de l'État, quel renouvellement des services d'appui à la traction animale ? *Revue d'Elevage et de Médecine vétérinaire des pays tropicaux*, 57(3-4), 241-247.
- Wampfler, B. (2006). Organisations paysannes et microfinance : une nouvelle alliance au service de l'agriculture familiale ? *Quel avenir pour l'agriculture familiale dans les pays ACP ? Rôle des organisations de producteurs dans les défis posés aux agricultures familiales des pays ACP, Bruxelles, Belgique, 2-5 mai 2006*.
- Wampfler, B., Lapenu, C., & Roesch, M., eds. (2002). *Le financement de l'agriculture familiale dans le contexte de libéralisation : quelle contribution de la microfinance. Actes du Séminaire international, Dakar, Sénégal, 21-24 janvier 2002*. Montpellier : Cirad/Cerise.

- Wele, P. (2010). *Note de cours intitulée « Calcul du Taux d'Intérêt dans les IMF » du Programme de Master en microfinance (2ème année). Année académique 2009-2010.* Université Africaine de Développement Coopératif (UADC), Cotonou, Bénin.
- Yabile, K. R. (2013). Déterminants de la sous-alimentation des ménages en Côte-d'Ivoire : cas des régions Centre et Centre-Est. *European Scientific Journal*, 9(14), 207-228.
- Yunus, M. (2013). *Le microcrédit. Notes personnelles.*
- Zeller, M. (2003). Models of rural financial institutions. *Paving the way forward for rural finance. An International Conference on Best practices. Washington D.C., June 2-4, 2003.* Wasington D.C. : USAID.
- Zidani, H., & Jarboui, A. (2011). L'impact des facteurs socio-économiques sur le financement des micro-projets par la Banque Tunisienne de Solidarité : cas de la Tunisie. *Revue Libanaise de Gestion et d'Economie*, 4(6), 158-181.

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APPENDIX

Table 5
Description of the Variables Included in the Logit Model

Variables	Labels
KIND	Sex
MATRI	Marital status
AGE	Age
AGE2	Age squared
SIZE	Household size
CULTR	Production of cash crops
GRPMT	Membership of a group
EDUC	Formal education
MFI	Existence of an MFI in the immediate environment
FORM	Training by an MFI
REVENUE	Returned
GUARANTEE	Existence of guarantees
SUP	Available area
RDEP	Dependency ratio

Source: Fieldwork (2019)

[¹] Farmers seek to make the most of their production by storing it until the time of the year when prices reach higher levels. These storage practices, however, depend on available cash and monetary requirements at the time of harvest.

[²] UEMOA (2007). Credit risk management and financing of WAEMU economies. Working paper n° 3. August 2007.

Table 6

Hosmer-Leshmshow Goodness-of-Fit Test of the Logit Model

Number of observations	459
Number of covariate patterns	459
Pearson $\chi^2(447)$	447.14
Prob > χ^2	.4890

Source: Fieldwork (2019)