

Performance of Family Farms: An Analysis of the Determinants of Access to Credit and Production Inputs in the South-Central Groundnut Basin of Senegal

Mbesse Trabina, L. J. P.^{1*}; Toure K.²; Kolinguenza Linzell, N. G. B.³; Ndiaye, S.²

¹National Higher School of Agriculture (ENSA); Doctoral School of Sustainable Development and Society, P.O. Box: A296, Thiès (Senegal), Iba Der Thiam University of Thiès (UIDT), Senegal

²Higher Institute of Rural Development (ISDR)/Mbaïki, University of Bangui, P.O. Box 1450, Avenue des Martyrs, Bangui, Central African Republic.

Corresponding Author: Mbesse Trabina, L. J. P.*

Publication Date: 2026/05/29

Abstract: This study aims to analyze the constraints on agricultural production within the Groundnut Basin of Senegal. A total of 503 farmers were interviewed across the regions of Kaffrine (17.7%) and Kaolack (82.3%) using structured field surveys. The research employed a multi-faceted analytical approach, including descriptive and comprehensive analyses, Analysis of Variance (ANOVA), and Correspondence Analysis (CA). The findings reveal that an overwhelming majority of producers (84%) lack access to agricultural financing. Regional disparities were observed: farmers in Birkelane cultivate the largest land areas (10.6 ± 1.1 ha) and incur the highest expenditures for seed procurement ($279,231 \pm 46,427$ CFA F). In contrast, producers in Kaffrine significantly outspend their counterparts ($p < 0.05$) on pesticide acquisition ($38,889 \pm 17,155$ CFA F). Limited access to credit (reported by 72% of respondents), coupled with the scarcity of inputs and modern agricultural equipment, constitutes the primary bottleneck for production in the Senegalese Groundnut Basin. Both male and female farmers in the study area identify the lack of funding, inadequate mechanization, and post-harvest preservation challenges as their most critical constraints.

Keywords: Access to Credit, Cultivated Area, Production Constraints, Agricultural Production, Senegal.

How to Cite: Mbesse Trabina, L. J. P.; Toure K.; Kolinguenza Linzell, N. G. B.; Ndiaye, S. (2026) Performance of Family Farms: An Analysis of the Determinants of Access to Credit and Production Inputs in the South-Central Groundnut Basin of Senegal. *International Journal of Innovative Science and Research Technology*, 11(5), 2128-2135. <https://doi.org/10.38124/ijisrt/26may1070>

I. INTRODUCTION

At the global level, the agricultural sector constitutes a central pillar of national economies, particularly in developing countries where it ensures the livelihoods of the majority of the population (Thirtle et al., 2003). For nearly 80% of the world's poorest populations, agriculture represents the primary source of income. In sub-Saharan Africa, and more specifically in Senegal, this sector remains a key driver of economic growth and employment generation. For instance, by the late 1990s, agricultural activities accounted for approximately 38.4% of the Gross Domestic Product (GDP) within the WAEMU area and currently engage nearly 75% of the active labor force. Despite its strategic importance, agricultural development in

the region is constrained by stagnating and in some cases declining levels of productivity (Assogba et al., 2017). Although agricultural development fundamentally relies on the interaction between land, labor, and market access (Laga et al., 2017), sustainable improvements in performance are closely linked to the effective adoption of proven technological innovations (Adégbola et al., 2010). However, rural areas in Senegal continue to be characterized by low productivity. This situation largely results from the use of outdated production tools, limited access to certified seeds, inadequate water management practices, and insufficient technical support and extension services (Sossou et al., 2017). More critically, the lack of adequate financing mechanisms severely hampers the modernization of agricultural holdings. As emphasized by Sossou et al.

(2020), these institutional shortcomings prevent the agricultural sector from becoming competitive and value generating. While some countries, such as Benin, have attempted to implement corrective policy measures (Bello et al., 2017), the Senegalese Groundnut Basin remains an area where persistent structural constraints particularly limited access to quality agricultural inputs, financial services, and extension support continue to undermine productivity growth and the resilience of farming systems. This study seeks to address this gap by analyzing the performance of family farms in the South-central part of the Groundnut Basin. The objective is to identify the key determinants of access to credit and productive resources. The research is structured in two main stages: first, a socioeconomic characterization of producers, followed by an in-depth analysis of the institutional barriers that restrict their access to production factors issues that remain insufficiently documented in the academic literature.

II. MATERIALS AND METHODS

➤ Study Area

The present study was conducted in the Groundnut Basin of Senegal, specifically within the regions of Kaffrine and Kaolack. In total, the research covered six departments, with three selected from each region (Figure 1). The selection of these departments was based on the regional significance of groundnut cultivation. The Kaolack region encompasses an area of 5,357 km², representing 2.8% of Senegal's national territory. Located in West-Central Senegal, it straddles the southern Sahelian and northern Sudanian zones, situated at 14°30' North latitude and between 14°30', 16°30' West longitude. The eco-geographical zone of the Kaolack region can be subdivided into two sub-zones, including the "Old Groundnut Basin" sub-zone, which covers three-quarters of the department. This sub-zone hosts two-thirds of the regional population, and groundnut cultivation is the dominant agricultural activity. The Kaffrine region covers an area of 11,492 km² with a population of approximately 600,000 inhabitants, making it one of the five largest regions in the country. The local population is primarily engaged in agriculture, livestock farming, and trade. Agropastoral activities employ 75% of the population, with millet and groundnuts constituting the primary agricultural outputs.

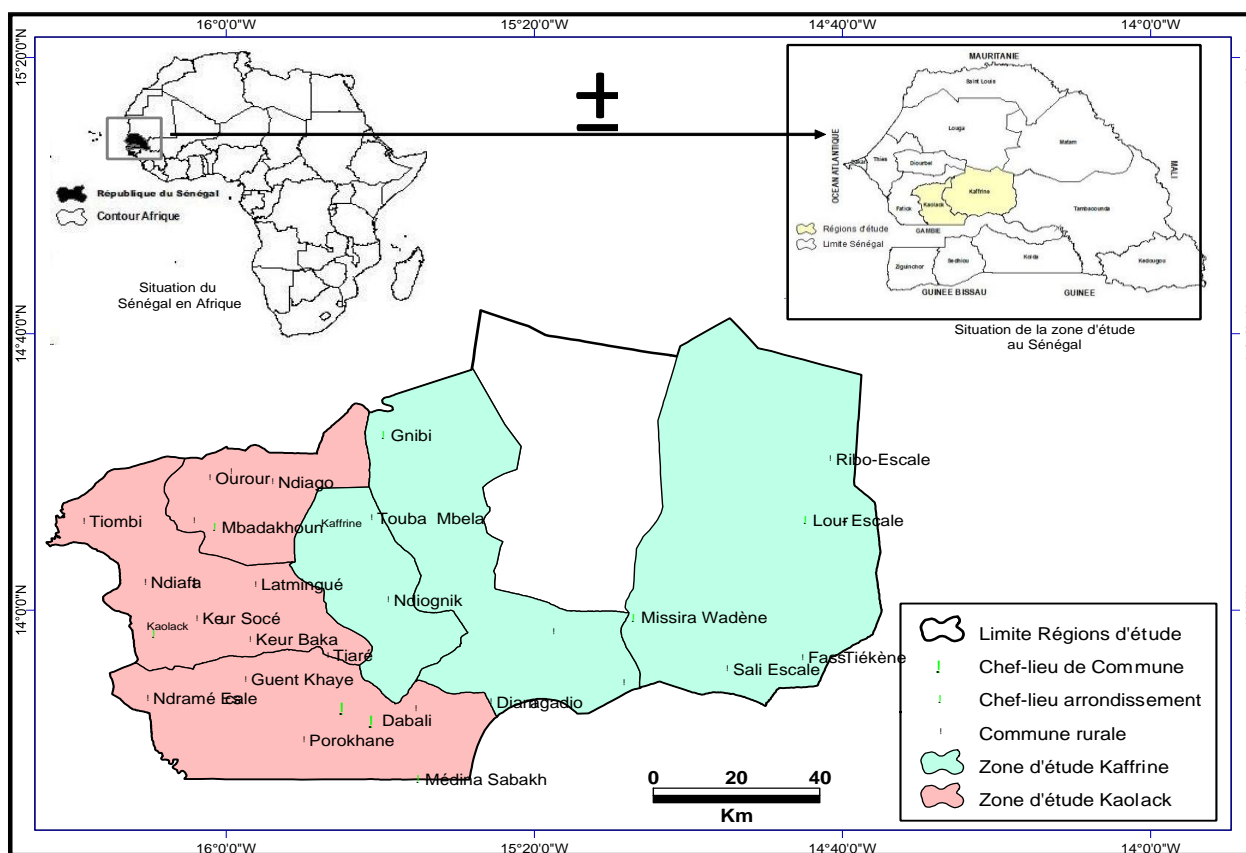


Fig 1 Geographical Location of the Surveyed Municipalities.

➤ Selection of Study Villages

The selection of the study villages was primarily based on criteria relating to the accessibility and cost of agricultural inputs, the localized knowledge of production

constraints, marketing channels for agricultural outputs, and membership in farmers' organizations. Additional socio-economic and logistical factors were also integrated into the selection process, including marital status, educational

attainment, land availability, year-round accessibility of the sites, and the willingness of producers to collaborate with the research team across various socio-linguistic groups. Consequently, 67 villages were purposively selected within the two target regions of the Senegalese Groundnut Basin. These villages are distributed across 45 communes, with 32 located in the Kaolack region and 13 in the Kaffrine region.

➤ *Sampling Method*

The sample size (N) was determined using the normal approximation of the binomial distribution, as proposed by Dagnelie (1998):

$$N = \left[\left(U_{1-\frac{\alpha}{2}} \right)^2 \times p(1 - p) \right] / d^2$$

The sample size calculation is based on the following parameters: $U_{1-\alpha/2}$ represents the critical value of the standard normal distribution for a confidence level of , where denotes the type I error rate. For $\alpha = 5\%$, the probability $1-\alpha/2 = 0,975$, yielding a critical value of . signifies the proportion of farmers possessing at least ten years of agricultural experience and fulfilling the eligibility criteria for agricultural credit within the study area. The margin of error (e), where $e=0,05$, was set at for this stud, based on the values derived from the exploratory phase of the research, a total of 503 producers were selected through a random sampling process. Table 1 details the distribution of respondents across the surveyed communes, departments, and regions.

➤ *Data Collection Methods and Instruments*

In each target village, a census of producers with a minimum of ten years of agricultural experience was conducted. The actual survey participants were purposively selected from those with prior experience in agricultural credit or current access to agricultural financing. Data were collected at the village level using a structured survey questionnaire. The captured information encompassed the socio-demographic characteristics of the surveyed households (including gender, age, household size, educational attainment, farm size, and primary economic activities) as well as specific constraints related to agricultural production.

➤ *Data Processing and Statistical Analysis*

The primary data were coded, entered, and processed using SPSS (Statistical Package for the Social Sciences) version 20.0 (10) to compute descriptive statistics, including percentages and means. Quantitative variables were subsequently subjected to an Analysis of Variance (ANOVA) using the General Linear Model (PROC GLM) in SAS (Statistical Analysis System) version 9.2, following the methodology described by Bello (11). Multiple comparisons of means were performed using the Least Significant Difference (LSD) test at a 5% significance level (12). To evaluate regional disparities and gender-specific trends, twelve distinct socio-cultural categories were established by intersecting the variables of "Department" and "Gender" (Table 1). For each category, the frequency of respondents identifying specific agricultural constraints was calculated. The resulting contingency table was then subjected to a Simple Correspondence Analysis (SCA) using Minitab 14, as outlined by Bello (11), to visualize the relationships between socio-demographic groups and their perceived production barriers.

Table 1 Sample Sizes Associated with the 12 Main Sociocultural Groups Studied (N = 503)

| Sociocultural Groups | Codes | Sample Size |
|----------------------|---------|-------------|
| Birkelane women | BirkFem | 01 |
| Men from Birkelane | BirkHom | 44 |
| Guinguineo women | GuiFem | 02 |
| Men from Guinguineo | GuiHom | 28 |
| Kaffrine women | KafFem | 06 |
| Men from Kaffrine | KafHom | 38 |
| Kaolack women | KaoFem | 12 |
| Men from Kaolack | KaoHom | 119 |
| Koungheul women | KounFem | 07 |
| Men from Koungheul | KounHom | 101 |
| Nioro women | NioFem | 09 |
| Men from Nioro | NioHom | 136 |
| Total | | 503 |

For each sociocultural group, the number of individuals who selected each constraint was calculated. The resulting contingency table was subjected to a simple Correspondence Analysis (CA) using Minitab version 14, following Bello et al. (2017). The results of the different analyses are presented in the form of tables and figures

III. RESULTS

➤ *Socio-Economic Characteristics of the Respondents*

The results related to the socio-economic variables of producers from the two regions studied in the groundnut basin of Senegal are presented in Table 2. Overall, male producers largely outnumber female producers, accounting for 92.6% and 7.4%, respectively. This indicates that men predominantly control agricultural land and production

activities, regardless of the department considered. In general, the majority of the respondents are married (96.8%), while only 2% remain single. With regard to education, most producers are illiterate (70%), except in the departments of Koungheul (51.1%) and Niore (71%), where a substantial proportion of respondents reported having received education in the Arabic language. Across the entire

study area, the age of the surveyed producers ranges from 20 to 90 years, with the 40–60-year age group representing the largest share (48.1%) of respondents. Most producers cultivate land areas between 5 and 10 ha (44.7%) and have very limited access to agricultural financing, as 84% of respondents reported no access to credit or formal financial support.

Table 2 Social Characteristics of the Producers.

| Variables | Categories | Percentage of Respondents (%) | | | | | | |
|---------------------------------------|-------------|-------------------------------|--------------------------------|------------------------------|------------------------------|--------------------------------|----------------------------|----------------------------|
| | | Birkelane (n=45) ¹ | Guinguineo (n=30) ¹ | Kaffrine (n=44) ¹ | Kaolack (n=131) ¹ | Koungheul (n=108) ¹ | Niore (n=145) ¹ | Total (n=503) ¹ |
| Age (years) | 20 ≤age≤ 40 | 31,10 | 30,0 | 22,7 | 28,2 | 31,5 | 42,8 | 33,0 |
| | 40 <age ≤60 | 42,20 | 36,70 | 63,70 | 53,50 | 51,8 | 34,0 | 48,1 |
| | Age> 60 | 26,70 | 33,30 | 13,60 | 18,30 | 16,7 | 17,2 | 18,9 |
| Sex | Men | 97,80 | 95,60 | 86,60 | 90,80 | 94,6 | 93,8 | 92,6 |
| | Women | 2,20 | 4,40 | 13,70 | 9,20 | 5,4 | 6,2 | 7,4 |
| Type of education | None | 73,30 | 73,30 | 77,80 | 66,40 | 37,4 | 15,2 | 43,7 |
| | Literate | - | 2,20 | - | 2,30 | 3,8 | 2,1 | 2,4 |
| | Arabic | 20,0 | 6,70 | 15,60 | 12,20 | 51,1 | 71,0 | 40,8 |
| | French | 6,70 | 17,80 | 6,7 | 19,10 | 7,6 | 11,7 | 13,1 |
| Marital status ² | Single | 4,40 | 8,90 | 2,20 | 1,50 | 0,8 | - | 2,0 |
| | Married | 95,60 | 88,90 | 95,50 | 97,0 | 98,4 | 99,3 | 96,8 |
| | Widowed | - | 2,20 | 2,20 | 1,5 | 0,8 | 0,7 | 1,2 |
| Membership in a farmers' organization | yes | 15,60 | 13,3 | 6,70 | 19,10 | 9,2 | 14,5 | 14,7 |
| | No | 84,40 | 86,7 | 93,30 | 80,90 | 90,8 | 85,5 | 85,3 |

➤ *Number of Surveyed Respondents*

According to sex (Table 3), the analysis of variance also showed no significant difference ($p > 0.05$) between men and women with respect to the age of producers. However, men cultivate significantly larger areas ($p < 0.05$) than women (8.7 ± 0.3 ha versus 5.1 ± 0.6 ha) and incur

higher total expenditures compared to women ($241,602 \pm 13,900$ CFA francs versus $124,571 \pm 15,470$ CFA francs). Overall, no significant differences ($p > 0.05$) were observed between men and women regarding expenditures related to fertilizer purchases, pesticide purchases, and seed purchases.

Table 3 Economic Characteristics of the Producers

| Variable s | Categories | Percentage of Respondents (%) | | | | | | |
|---|--------------------------------------|-------------------------------|--------------------------------|------------------------------|------------------------------|--------------------------------|----------------------------|----------------------------|
| | | Birkelane (n=45) ¹ | Guinguineo (n=30) ¹ | Kaffrine (n=44) ¹ | Kaolack (n=131) ¹ | Koungheul (n=108) ¹ | Niore (n=145) ¹ | Total (n=503) ¹ |
| Total area (ha) | 1 ≤ sup ≤5ha | 22,20 | 36,7 | 36,40 | 34,40 | 30,60 | 35,9 | 33,2 |
| | 5 <sup ≤10 | 44,50 | 40,0 | 41,30 | 49,60 | 34,2 | 45,6 | 44,7 |
| | Sup >10 | 33,30 | 23,30 | 20,50 | 16,0 | 35,2 | - | 22,1 |
| Method of selling agricultural products | Farm-gate | 55,60 | 11,10 | 31,10 | 32,80 | 29,8 | 37,9 | 36,0 |
| | Local markets without intermediaries | 20,0 | 26,70 | 24,40 | 37,40 | 29,8 | 42,0 | 36,0 |
| | Local markets with intermediaries | 2,20 | 6,70 | 8,90 | 7,60 | 19,8 | 15,2 | 13,1 |
| | Direct sales to consumers | - | - | 8,90 | 3,80 | - | 1,4 | 2,2 |
| | Others | 22,20 | 55,50 | 26,60 | 18,40 | 20,6 | 3,5 | 12,7 |
| Access to financing | Yes | 24,40 | 13,70 | 15,60 | 27,50 | 9,2 | 6,2 | 16,1 |
| | No | 75,60 | 86,30 | 84,40 | 72,50 | 90,8 | 93,8 | 83,9 |

According to departments (Table 4), the analysis of variance revealed no significant differences ($p > 0.05$) among departments with respect to the age of producers. A substantial proportion of producers (48%) fall within the 40–60-year age group. The majority of producers (85.3%) do not belong to any farmers' organization and market their agricultural products mainly through weekly local markets

(loumas) without intermediaries or at the farm gate (36% of producers), regardless of the department. Furthermore, the analysis of variance indicated that producers in the Birkelane department cultivate significantly larger land areas (10.6 ± 1.0 ha) and spend more on seed purchases ($279,231 \pm 46,427$ CFA francs) compared to other departments ($p < 0.05$) (Table 3). In contrast, producers in

the Kaffrine department spend significantly more on pesticide purchases (38,889 ± 17,155 CFA francs) than those in other departments (p < 0.05) (Table 3). Overall, no

significant differences (p > 0.05) were observed among departments with regard to total expenditures, fertilizer expenditures, and seed expenditures.

Table 4 Quantitative Socioeconomic Data (Means ± Standard Error) of Producers in the Groundnut Basin of Senegal by Department

| Department | Age (Years) | Total Area (Ha) | Fertilizer Expenditures (CFA Francs) | Pesticide Expenditures (CFA Francs) | Seed Expenditures (CFA Francs) | Total Expenditures (CFA Francs) |
|-------------|-------------|-----------------|--------------------------------------|-------------------------------------|--------------------------------|---------------------------------|
| Birkelane | 49,96±2,15 | 10,61±1,07a | 147 931,82±16250,98 | 15 478,79±3365,58b | 279 230,77±46426,69a | 317 328,89±43276,45 |
| Guinguinéo | 48,93±3,07 | 7,79±0,84b | 79608,0±17923,09 | 8657,69±1370,87b | 196 111,11±46 424,29b | 268 225,0±57620,27 |
| Kaffrine | 49,75±1,97 | 9,39±1,64ab | 101 087,50±13669,63 | 38 888,89±17 154,89a | 107 584,86±24 338,94b | 169 883,33±30 042,80 |
| Kaolack | 49,91±1,34 | 7,41±0,38b | 108 676,92±10760,92 | 13 337,38±1942,40b | 132 865,53±13 140,86b | 205 470,58±16973,90 |
| Koungheul | 49,54±1,30 | 9,44±0,58ab | 140 617,50±40249,83 | 19 939,39±7391,09b | 175 628,38±19387,34b | 249 039,0±42312,85 |
| Nioro | 47,42±1,16 | 7,69±0,49b | 143 323,53±17 746,85 | 23 287,50±3468,86b | 140 141,67±14 889,12b | 232 562,15±21 366,66 |
| F-value | 0,60 | 3,05 | 0,93 | 2,98 | 4,72 | 1,58 |
| Probability | 0,70 | 0,01 | 0,46 | 0,01 | 0,0004 | 0,16 |

Means followed by the same alphabetical letters are not significantly different (P > 0.05) according to the least significant difference (LSD) test

Table 5 Quantitative Socioeconomic Data (Means ± Standard Error) of Producers in the Groundnut Basin of Senegal by Sex

| Sex | Age (Years) | Total Area (Ha) | Fertilizer expenditures (CFA francs) | Pesticide Expenditures (CFA Francs) | Seed Expenditures (CFA Francs) | Total Expenditures (CFA Francs) |
|--------------------|-------------|-----------------|--------------------------------------|-------------------------------------|--------------------------------|---------------------------------|
| Woman | 45,86±1,84 | 5,08±0,35b | 54 269,23±6647,28 | 7000,0±1548,66 | 101 821,43±12 843,28 | 124 571,43±15 469,63b |
| Man | 49,30±0,65 | 8,67±0,29a | 132 812,10±552,83 | 17 178,91±1732,39 | 162 628,50±9657,70 | 241 601,99± 13 899,99a |
| F-value | 2,14 | 11,45 | 3,52 | 2,09 | 3,48 | 5,44 |
| Probability | 0,14 | 0,0008*** | 0,06 | 0,149 | 0,06 | 0,02* |

Means followed by the same alphabetical letters are not significantly different (P > 0.05) according to the least significant difference (LSD) test

➤ *Agricultural Production Constraints in the Groundnut Basin of Senegal*

The results of the descriptive analysis conducted on production constraints faced by producers in the two surveyed regions of the groundnut basin of Senegal are presented in Table 5. The analysis shows that access to

credit and financing constitutes the main constraint faced by producers in the groundnut basin of Senegal (72%). Beyond this constraint, limited access to agricultural inputs and farm equipment represents other major constraints reported by producers in the study area (22.7%).

Table 6 Agricultural Production Constraints in the Groundnut Basin of Senegal

| Production Constraints | Percentage of Respondents (%) | | | | | | |
|---|-------------------------------|--------------------------------|------------------------------|------------------------------|--------------------------------|----------------------------|----------------------------|
| | Birkelane (n=45) ¹ | Guinguineo (n=30) ¹ | Kaffrine (n=44) ¹ | Kaolack (n=131) ¹ | Koungheul (n=108) ¹ | Nioro (n=145) ¹ | Total (n=503) ¹ |
| Access to credit | 50,0 | 47,9 | 40,0 | 50,3 | 50,3 | 50,0 | 49,9 |
| Access to finance | 43,8 | 26,7 | 25,0 | 31,9 | 18,9 | 17,6 | 23,0 |
| Access to agricultural inputs | 1,20 | 11,7 | 13,6 | 3,9 | 14,0 | 15,7 | 9,9 |
| Access to land | - | 1,7 | 6,5 | 0,5 | 1,6 | 1,2 | 1,9 |
| Post-harvest storage of agricultural products | - | - | 0,3 | - | 0,9 | 1,1 | 0,7 |
| Water shortage | 1,7 | 0,3 | 2,8 | 1,3 | 0,8 | 2,3 | 1,8 |
| Lack of agricultural equipment | 3,3 | 11,7 | 11,8 | 12,1 | 13,5 | 12,1 | 12,8 |

➤ *Number of Surveyed Respondents*

The analysis reveals that access to financing constitutes the main constraint faced by producers in the groundnut basin of Senegal (72.9%). Limited access to agricultural inputs and lack of production equipment represent secondary constraints reported by producers (9.9% and 12.87%, respectively). In contrast, access to land, post-harvest storage, and water shortage are reported far less

frequently as production constraints in the groundnut basin. The results indicate that the first two axes explain 78.6% of the total inertia (Table 7). Accordingly, the Correspondence Analysis (CA) shows that the main agricultural production constraint faced by female producers in the Nioro department (NioFem) is water shortage for agriculture, whereas women in Kaolack and men in Kaffrine primarily identify access to credit as their major constraint.

Table 7 Analysis of the Contingency Table

| Axes | Inertia | Proportion | Cumulative Proportion |
|------|---------|------------|-----------------------|
| 1 | 0,1055 | 0,4883 | 0,4883 |
| 2 | 0,0642 | 0,2973 | 0,7856 |
| 3 | 0,0201 | 0,0930 | 0,8786 |

The analysis of the results reveals that the agricultural production constraints faced by female producers in the Nioro department (NioFem) are primarily related to water shortages for agriculture, whereas women in Kaolack and men in Kaffrine identify access to credit as their main constraint.

as men from the Nioro (NioHom) and Guinguinéo (GuiHom) departments and women from Kaffrine (KafFem), their major constraints are limited access to financing, difficulties related to the storage of agricultural products, and lack of agricultural equipment. However, according to women from the Guinguinéo (GuiFem) and Birkelane (BirkFem) departments and men from Birkelane (BirkHom) and Kaolack (KaoHom), the main constraints are access to agricultural inputs and access to land (Figure 2)

➤ *Access to Credit*

With regard to female producers (KounFem) and male producers (KounHom) in the Kounghoul department, as well

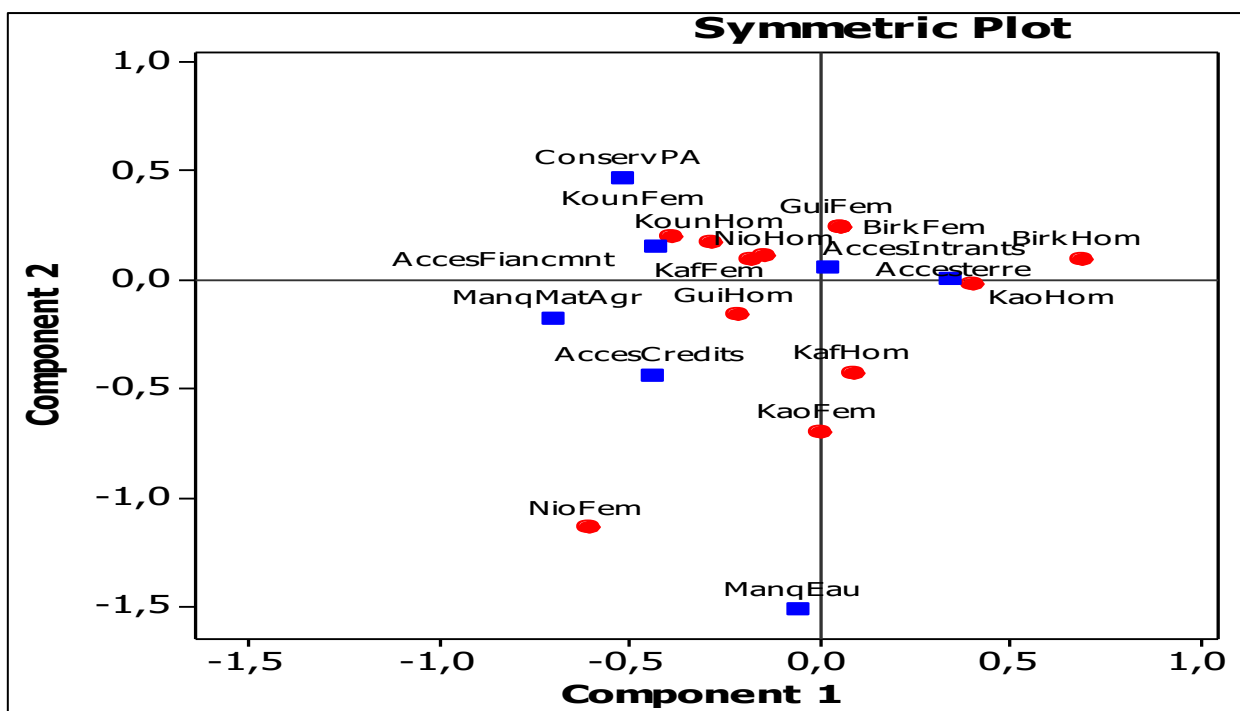


Fig 2 Agricultural Production Constraints : Projection of Sociocultural Groups in the Factorial Axis System Resulting from a Correspondence Analysis (CA)

IV. DISCUSSION

The results of this study indicate that the majority of producers fall within the 40–60 age group, with an average age of approximately 49 years across the two surveyed regions. This demographic structure reflects an aging agricultural workforce, a trend frequently reported in West and Central African farming systems. In addition, most producers have limited formal education and exhibit low

levels of participation in farmers’ organizations, suggesting weak institutional integration and limited collective action. Comparable patterns have been documented among groundnut producers in Benin and Chad, where agricultural production is predominantly managed by older individuals with limited organizational affiliation (Didagbé et al., 2015; Naitormbaide, 2007). The predominance of older farmers may be partly explained by persistent barriers faced by younger individuals in accessing secure and long-term land

tenure, which constrains their engagement in perennial or capital-intensive agricultural activities and encourages a preference for annual crops such as groundnuts (Balogoun et al., 2014).

Gender disparities remain pronounced in the study area, with men overwhelmingly dominating groundnut production. This imbalance is largely attributable to customary land tenure systems that restrict women's access to land ownership and productive resources (Saïdou et al., 2007). As a consequence, women in several departments, notably Guinguiné and Birkelane, identified land access as a major production constraint. Similar gender-based inequalities have been reported in other West African contexts, including yam production systems in northwestern Benin, where women represent a small proportion of producers and exhibit high levels of illiteracy (Loko et al., 2013). Nevertheless, evidence from other cropping systems suggests that agriculture continues to involve a wide range of age groups. For instance, Traoré et al. (2021) observed a broad age distribution among sorghum producers in Mali, highlighting the socially inclusive nature of agriculture in African rural societies.

In terms of farm size, most producers in the present study cultivate between 5 and 10 hectares, which is consistent with findings from similar agroecological zones in Mali (Traoré et al., 2021). Expenditure patterns further reveal that investments in pesticides and fertilizers are substantially lower than those allocated to seed purchases. This allocation reflects the production strategies commonly observed in legume-based systems, where crops such as groundnuts are often cultivated with limited use of external inputs, particularly chemical fertilizers and pesticides (Chabi et al., 2019). While this approach may reduce short-term production costs, it may also contribute to yield stagnation, especially under conditions of declining soil fertility.

Limited access to agricultural financing emerges as one of the most critical constraints affecting producers in both regions, with more than four-fifths of respondents reporting no access to formal credit. This finding aligns with previous studies indicating that financial exclusion remains a major impediment to agricultural intensification and productivity growth in sub-Saharan Africa (Ndione, 2019; Diamouténé, 2019). Access to credit plays a pivotal role in enabling farmers to invest in improved inputs, technologies, and farm management practices. Empirical evidence suggests that farming experience, combined with access to financial services and markets, significantly enhances agricultural productivity and household income (Hassan & Nhemachena, 2008; Bello et al., 2017). Consequently, low farm incomes observed among certain producers are not necessarily a function of farm size but rather the result of constrained access to financial resources, a conclusion that corroborates earlier findings in similar contexts (Sossou et al., 2020).

The persistence of credit constraints also has broader socioeconomic implications. Previous studies have demonstrated that even modest increases in agricultural

productivity can generate substantial poverty-reduction effects, particularly in rural Africa (Thirtle et al., 2003). Productivity gains not only improve farm incomes but also enhance consumers' purchasing power, thereby contributing to overall economic welfare (Johnson & Niño-Zarazúa, 2009). From this perspective, expanding access to agricultural credit constitutes a strategic priority for improving the performance and resilience of smallholder farming systems in the Senegalese groundnut basin. Further investigation into the determinants of credit access is therefore essential to inform targeted policy interventions.

Beyond financial constraints, agricultural production in West Africa is increasingly challenged by land degradation and declining soil fertility. In Senegal, accelerated soil nutrient depletion has been associated with continuous yield reductions in major crops, exacerbated by the gradual abandonment of traditional long-fallow systems in favor of shorter fallow periods (Diagne et al., 2012). Although various soil fertility management technologies have been proposed to address these challenges, their adoption remains limited (Sanou & Soulé, 2017). Numerous studies have shown that improved technologies can enhance productivity, reduce poverty, and strengthen food security when effectively adopted (Mwangi & Kariuki, 2015; Roussy et al., 2015). However, field observations suggest that adoption rates remain low, indicating the presence of structural, institutional, and knowledge-related barriers that merit closer examination.

Additional constraints, including labor shortages, insufficient extension services, and increasing climate variability, further compound the challenges faced by agricultural producers in the region (Laga et al., 2017). Importantly, several authors emphasize that access to credit alone is unlikely to generate sustainable productivity gains in the absence of adequate technical training and advisory support (Diagne et al., 2012; Sossou et al., 2017; Laga et al., 2017). This underscores the need for integrated development strategies that combine financial inclusion with capacity building and institutional strengthening to foster durable improvements in agricultural performance.

V. CONCLUSION

The present study revealed that male producers outnumber female producers in the study area. Overall, the majority of the surveyed producers are married. With regard to education, most producers are uneducated, except in the Kounghoul and Niore departments, where a substantial proportion reported having received Arabic education. Across the entire study area, the age of producers ranges from 20 to 90 years, with the 40–60-year age group being the most represented. Most producers cultivate land areas between 5 and 10 ha and have very limited access to agricultural financing. Access to finance, together with limited access to agricultural inputs and production equipment, constitutes the main constraints faced by producers in the groundnut basin of Senegal. Notably, both male and female producers in the Kounghoul department, men in the Niore and Guinguiné departments, and women

in Kaffrine identified lack of financing, post-harvest storage constraints, and shortages of agricultural equipment as their major production constraints. In light of these findings, further research on the determinants of access to credit in the groundnut basin of Senegal is warranted, with the aim of contributing to improved access to financing for producers and enhancing agricultural productivity and livelihoods.

REFERENCES

- [1]. Adégbola, P. Y., Arouna, A., Hinnou, L., Adékambi, S., & Ahouandjinou, C. (2010). Taux et déterminants de l'adoption des innovations technologiques développées par l'INRAB entre 2000 et 2006 (Rapport d'étude, 134 p.). INRAB.
- [2]. Aminou, A. F. A. (2018). Technical efficiency of small maize producers in Benin. *European Scientific Journal*, 14(19), 110–134. <https://doi.org/10.19044/esj.2018.v14n19p110>
- [3]. Assogba, P. N., Kokoye, S. E. H., Yegbemey, R. N., Djenontin, J. A., Tassou, Z., Pardoe, J., & Yabi, A. J. (2017). Determinants of credit access by smallholder farmers in north-east Benin. *Journal of Development and Agricultural Economics*, 9(8), 210–216.
- [4]. Baffoe-Asare, R., Danquah, J. A., & Annor-Frempong, F. (2013). Socioeconomic factors influencing adoption of CODAPEC and cocoa high-tech technologies among smallholder farmers in Ghana. *American Journal of Experimental Agriculture*, 3(2), 277–292.
- [5]. Balogoun, I., Saïdou, A., Ahoton, E. L., Amadji, G. L., Ahohuendo, C. B., Adebo, J. B., Babatoundé, S., Chougourou, D., Adoukonou, S. H., & Ahanchédé, A. (2014). Caractérisation des systèmes de production à base d'anacardier dans les principales zones de culture au Bénin. *Agronomie Africaine*, 26(1), 9–22.
- [6]. Bello, O. D., Ahoton, L. E., Saïdou, A., Akponikpè, I. P. B., Ezin, V. A., Balogoun, I., & Aho, N. (2017). Climate change and cashew (*Anacardium occidentale* L.) productivity in Benin: Perceptions and endogenous adaptation measures. *International Journal of Biological and Chemical Sciences*, 11(3), 924–946.
- [7]. Benabdelmoula, F. (2017). Les déterminants de l'octroi de crédits bancaires aux entreprises : Étude comparative entre la banque conventionnelle et la banque islamique (Thèse de doctorat). Université Côte d'Azur.
- [8]. Chabi, F. O., Dagbenonbakin, G. D., Oussou, B., & Saïdou, A. (2019). Determinants of groundnut (*Arachis hypogaea* L.) yield improvement in farmers' cropping systems in Benin. *African Journal of Agricultural Research*, 14(34), 1967–1979. <https://doi.org/10.5897/AJAR2019.14418>
- [9]. Dagnelie, P. (1986). *Théorie et méthodes statistiques : Applications agronomiques* (Vol. 2). Presses agronomiques de Gembloux.
- [10]. Dagnelie, P. (1998). *Statistique théorique et appliquée* (Tome 2). De Boeck & Larcier.
- [11]. Dègla, P. K., Daanon, P., Onzo, A., & Tomavo, E. (2020). Analyse comparative des performances économiques des systèmes de production du maïs dans la commune de Banikoara au Nord-Bénin. *Sciences de la Vie, de la Terre et Agronomie*, 8(1), 56–64.
- [12]. Diagne, A., Dontsop-Nguezet, P. M., Kinkingninhou-Medgabé, F. M., Alia, D., Adégbola, P. Y., Coulibaly, M., Diawara, S., Dibba, L., Mahamood, N., Mendy, M., Ojehomon, V. T., & Wiredu, A. N. (2012). The impact of adoption of NERICA rice varieties in West Africa. SPIA Pre-conference Workshop, 28th IAAE Conference, Brazil.
- [13]. Diamouténé, A. K. (2019). Accès au crédit agricole et performance agricole dans la zone Office du Niger : Cas de la culture du riz. *Annales des Sciences Économiques et de Gestion*, 18(2), 45–61.
- [14]. Didagbé, O. Y., Hounngandan, P., Dedehouanou, H., Sina, H., Bello, O. D., Toukourou, F., & Baba-Moussa, L. (2015). Characterization of peanut production systems in their main cultivation areas in Benin. *European Scientific Journal*, 11(33), 1857–7881.
- [15]. Fall, A. A. (2006). Impact du crédit sur le revenu des riziculteurs de la vallée du fleuve Sénégal (Thèse de doctorat). ENSA Montpellier.
- [16]. Hassan, R., & Nhemachena, C. (2008). Determinants of African farmers' strategies for adapting to climate change: A multinomial choice analysis. *African Journal of Agricultural Research*, 2(1), 83–104.
- [17]. Johnson, S., & Niño-Zarazúa, M. (2009). Financial access and exclusion in Kenya and Uganda (Working Paper No. 1).
- [18]. Kadjie, C. F., & Omenguele, G. R. (2019). L'effet synergique des déterminants de l'accès au financement bancaire par les PME au Cameroun. *Journal of Academic Finance*, 10(2), 84–100.
- [19]. Loko, Y. L., Dansi, A., Agre, A. P., Akpa, N., Dossou-Amin, I., Assogba, P., Akpagana, K., & Sanni, A. (2013). Farmers' perceptions and impacts of climate change on yam production in northwestern Benin. *International Journal of Biological and Chemical Sciences*, 7(2), 672–695. <https://doi.org/10.4313/ijbcs.v7i2.24>
- [20]. Mwangi, M., & Kariuki, S. (2015). Factors determining adoption of new agricultural technology by smallholder farmers in developing countries. *Journal of Economics and Sustainable Development*, 6(5), 1–10.
- [21]. Naitormbaide, M. (2007). Effets des pratiques paysannes de gestion de la fertilité sur les sols de savane du Tchad (Mémoire DEA). Université Polytechnique de Bobo-Dioulasso.
- [22]. Ndione, M. (2019). Déterminants de la performance des institutions de microcrédit (Thèse de doctorat). Université Bourgogne Franche-Comté.
- [23]. Norusis, M. J. (2002). *SPSS 11.0 guide to data analysis*. Prentice Hall.
- [24]. Roussy, C., Ridier, A., & Chaib, K. (2015). Adoption d'innovations par les agriculteurs (Working Paper SMART-LERECO