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Differentiated Analysis of the Occupational Integration of Young Agricultural Bachelor Degree Holders in Agricultural Entrepreneurship: Case Study from the University of Abomey-Calavi in the Republic of Benin

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Authors' contributions

This work was carried out in collaboration among all authors. Author TAK designed the study, performed data analysis, and wrote the first draft of the manuscript. Author GND completed literature searches and data collection activities and contributed to the design of the draft of the paper. Authors EG, YZM, RO and RCT designed the paper and reviewed the drafts. All authors read and approved the final manuscript.

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ABSTRACT

At a time when agricultural entrepreneurship is increasingly recognized as a crucial alternative to unemployment and underemployment, particularly in developing countries, it is becoming imperative to have baseline or reference information on entry into the agricultural entrepreneurship sector. This article gives an overview of the integration of 1,305 agricultural bachelor degree holders into agricultural entrepreneurship in Benin. These bachelors studied and graduated in the bachelor-master-doctorate program (labeled LMD program) of the Faculty of Agricultural Sciences of the University of Abomey-Calavi (FSA/UAC) between 2011 and 2020. Data related to the occupational integration of this target population were collected with the help of online surveys. These data were statistically analyzed using Excel v.2019 and STATA v.15. Results reveal an overall integration rate of 16.17%, with significant variations ranging from 6% to 27% from one year to the next. Gender disparities are also notable, with only 29.52% of target bachelors entering agricultural entrepreneurship as women.

Keywords: Agricultural entrepreneurship; bachelor-master-doctorate program; young agricultural undergraduates and graduates' employment; occupational integration; gender disparities.

1. INTRODUCTION

Nowadays, agricultural entrepreneurship is at the heart of global socio-economic dynamics, representing a major challenge for many countries, including the Republic of Benin. In this era of marked economic growth since the 2000s [1], it is paradoxical to note that unemployment and underemployment remain persistent scourges, especially among young graduates, despite their academic qualifications. The unemployment and underemployment rates in Benin are 2.4% and 72% respectively [2]. Against this backdrop, it is worrying to note that professional integration remains an uphill struggle for the vast majority of university graduates, including those from the field of agronomy. Alarming figures from the *Institut National de la Statistique et de l'Analyse Économique (INSAE)* show that only 11.2% of graduates aged between 15 and 29 have managed to make the difficult transition from school to the world of work [3]. This worrying situation is not confined to the agricultural sector, where many agronomy graduates struggle to find stable employment. Faced with this pressing problem, agricultural entrepreneurship is an appropriate response. In Benin, the government has identified the agricultural sector as a vector for wealth and job creation, detailing its ambitions in its "Government Action Programme 2016-2021" [4]. Agricultural entrepreneurship has been identified as a key lever for meeting the challenges of employment in this vital sector. However, one crucial question remains unanswered: how many agronomy graduates are embarking on agricultural entrepreneurship in Benin? To date, no exhaustive study has examined this issue. In a previous article, we analyzed the state of agri-entrepreneurial integration of agricultural engineers in Benin [5]. However, agricultural entrepreneurship is not limited to agricultural engineers. Agricultural entrepreneurs with a Bachelor's-Master's-Doctorate (LMD) degree in agronomy represent an essential component of this sector, especially as they are trained to be more field agents than engineers, who are trained to be design executives. This article aims to fill this gap in research and information by drawing up a detailed report on the integration of graduates of the LMD agronomy course at the Faculty of Agronomic Sciences of the University of Abomey-Calavi (FSA/UAC) in Benin. The article is divided into five sections. A first introductory section, a second section presents the methodology adopted as part of the study, a third section presents the results obtained, a fourth discusses these results, and a final section presents the conclusions of the study and some policy suggestions.

2. METHODOLOGY

This section details the research methodology adopted for this study. It describes the study

sample, the methods and tools used to collect the data, and those used to process the data collected.

2.1 Justification for the Case Study

The Faculty of Agricultural Sciences (FSA) of the University of Abomey-Calavi (UAC) was established in 1975 and is reputed to be an institution of excellence in agronomy studies in Benin. Its bachelor – master – doctorate program was launched in 2007, and it offers competencies to students in various fields such as plant and animal production, crop production, human nutrition and food processing, agricultural and rural economics and socio-anthropology, and the development and management of natural resources. It equips students with theoretical as well as technical and practical skills in agriculture, making them potential qualified agricultural entrepreneurs. The first cohort of bachelors trained at the FSA graduated with their Bachelor's degrees in the 2011-2012 academic year.

2.2 Sampling

The study sample was composed of agricultural entrepreneurs who completed their bachelor's degrees in the Faculty of Agricultural Sciences and were working in Benin. The sampling frame used was made of a list of 1,305 (including 382 or 29.27% of female and 923 or 70.73% of male) students who graduated with their Bachelor's degrees at the Faculty of Agricultural Sciences (FSA) between 2011 and 2020. The agricultural entrepreneurs considered in the sample met the following criteria:

- They were physical persons who owned at least a company involved in the production and marketing of an agricultural product, with the primary aim of making profits.
- They held at least a professional bachelor’s degree in agricultural sciences obtained at the FSA.

2.3 Data Collection Methods and Tools

Data collection took place from November 2020 to March 2021. The data collected related to the number of agricultural entrepreneurs who graduated with their bachelor's degrees at the FSA, their genders, and their professional status (agricultural entrepreneur or not). It involved the use of a digitalized questionnaire, designed with Kobocollect data collection software. This questionnaire was administered online to the entire sampling frame (1,305 bachelor graduates). At the same time, face-to-face interviews, telephone calls, and e-mail exchanges were carried out, depending on the choices and availability of participants. Of the 1,305 bachelor's degree holders targeted, 1,295 (99%) were contacted online via WhatsApp messaging application, 15 (1%) in person, and 0 by email. The response rate was 100%, indicating full participation by all the bachelor's degree holders contacted. It should be noted that the exhaustive list of the bachelor degree holders obtained from the Faculty’s registration office, greatly facilitated the interaction process. The use of WhatsApp groups created by each cohort of students also played an essential role, given the relative youth of the graduates (the first graduating class dates from 2011). However, we had to remind the respondents several times as necessary before reaching the 100% of responsiveness. This challenge justifies the relatively long data collection period of November 2020 to March 2021.

2.4 Data Processing and Analysis Methods and Tools

The data collected was entered in and cleaned up using Excel spreadsheets, and then subjected to frequency and means calculations using STATA version 15 software. The results of these estimates are then presented in the form of tables and diagrams, the contents of which are analyzed in the light of their links with the study objective and the help of relevant literature [6].

3. RESULTS

This section deals respectively with changes in the numbers of bachelor degree holders who engaged themselves in agricultural entrepreneurship by gender and year; the overall trend in their rate of engagement into agricultural entrepreneurship in Benin over the study period; their rate of engagement per year and gender.

3.1 Trends in Numbers of the Bachelor Degree Holders who Graduated at the FSA, by Gender and Academic Year

Fig. 1 shows trends in the number of graduation of bachelor degrees at the FSA, by gender and year.

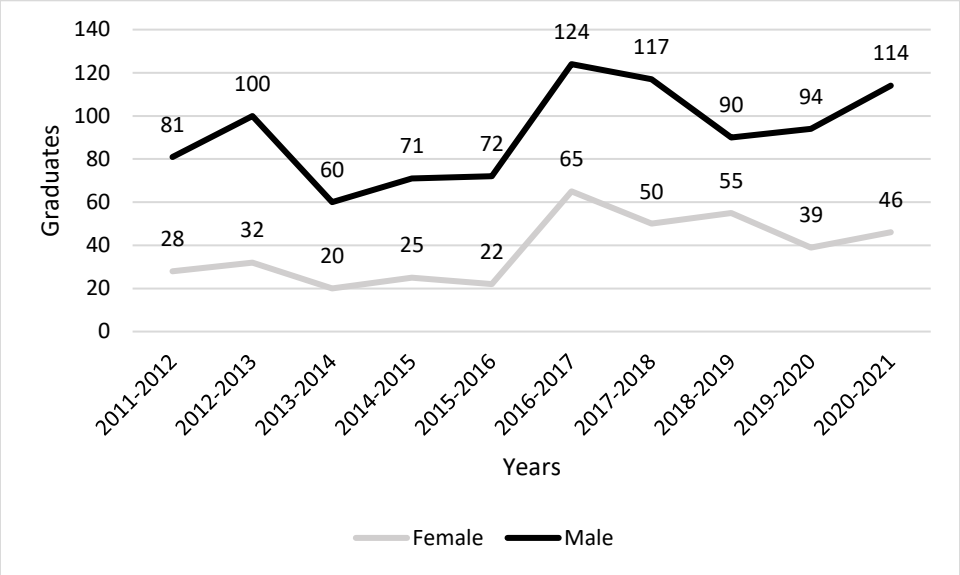

Fig. 1. Differentiated trends of graduation of agricultural bachelor degrees at the FSA between 2011 and 2020

Fig. 1 presents two curves showing the evolution of the numbers of female and male people holding bachelor degrees obtained at the FSA, from 2011 to 2021.

Both curves show sinusoidal evolutions of the numbers of undergraduates but with the numbers of male bachelor degree holders constantly outstripping those of the females. The lowest percentage of female undergraduates recorded is about 23% (in 2015-2016), while the highest one is about 38% (in 2018-2019) of the total number of students who graduated. In all, one can observe that the gender gap is slowly closing between female and male bachelor's degree holders graduating from the studied faculty.

3.2 Overall Rate of Integration of Agricultural Bachelor Degree Holders from the FSA into Agricultural Entrepreneurship in Benin, between 2011 and 2020

Table 1 shows the rate of integration of agricultural bachelor degree holders who graduated at the FSA into agricultural entrepreneurship in Benin, between 2011 and 2020.

Analysis of Table 1 reveals the breakdown of graduates into three distinct categories: agricultural entrepreneurs, non-agricultural entrepreneurs, and agricultural entrepreneurs who gave up. It can be seen that very few agricultural bachelor's degree holders have embraced agricultural entrepreneurship. Considering that these undergraduates came from 10 cohorts, one can observe that on average, each cohort generated 21.1 agricultural entrepreneurs over the 10 academic years studied, which means an average of 2 entrepreneurs per year per cohort.

Fig. 2 shows the overall gender distribution of the agricultural bachelor's degree holders who graduated from the FSA and who are agricultural entrepreneurs, between 2011 and 2021.

Analysis of this figure indicates that male undergraduates are about three times more involved in agricultural entrepreneurship in Benin than the fellow females.

Table 1. Overall insertion rates of agricultural bachelor degree holders from the FSA in agricultural entrepreneurship between 2011 and 2020

Type of insertion	Frequencies	Percentages (%)
Agricultural entrepreneur	211	16.17
An agricultural entrepreneur who gave up	5	0.38
Non-agricultural entrepreneur	1,089	83.44
Totals	**1,305**	**100**

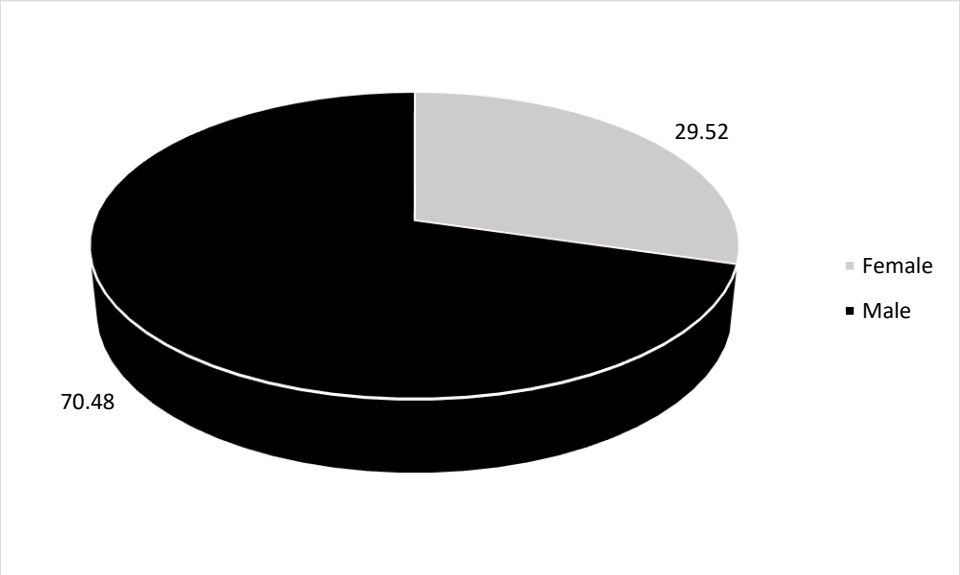

Fig. 2. Gender distribution of agricultural bachelor degree holders from the FSA who are agricultural entrepreneurs (N= 211)

3.3 Overall Evolution of the Integration Rate of Agricultural Bachelor Degree Holders in Agricultural Entre-preneurship between 2011 and 2020

Fig. 3 shows the yearly evolution of the integration rate of the engagement of the young agricultural bachelor degree holders from the FSA in agricultural entrepreneurship in Benin.

Analysis of this figure shows that the entry rate has moved up and down, with three peaks recorded in 2011-2012 (14%), 2015-2016 (27%), and 2020-2021 (24%) academic years respectively.

3.4 Differentiated Evolution of the Rates of Integration of Agricultural Bachelor Degree Holders from the FSA into Agricultural Entre-Preneurship

Fig. 4 shows the yearly evolution of the rate of integration of agricultural bachelor degree holders from the FSA into agricultural entrepreneurship in Benin by gender, between 2011 and 2021.

Analysis of this figure shows that, in general, The number of male and female undergraduates entering agricultural entrepreneurship varies from year to year. This figure also highlights that more male undergraduates engage in agricultural entrepreneurship than their fellow females each year.

4. DISCUSSION

The main objective of this article was to analyze the rate at which agricultural bachelor's degree holders from the Faculty of Agricultural Sciences (FSA) engage in agricultural entrepreneurship. This section discusses the results presented above.

4.1 Low Engagement of Agricultural Bachelor Degree Holders in Agricultural Entrepreneurship

The results of this article revealed an overall rate of 16.17% for the integration of agricultural bachelor degree holders into agricultural entrepreneurship, highlighting a marked preference among most of these professionals for other job paths, at the exclusion of agricultural entrepreneurship. This result corroborates the findings of Mridula and Sakeer [7] Mridula and Sakeer (2020) in the state of Kerala, which indicates that the job of an agricultural entrepreneur is the one least preferred by graduates because of the risks and insecurity associated with agriculture. Similar conclusions were drawn by Ramesh et al. [8] Bharadwaja et al.'s (2017) study on the career preferences of veterinary students in Andhra Pradesh, revealing a preference for the

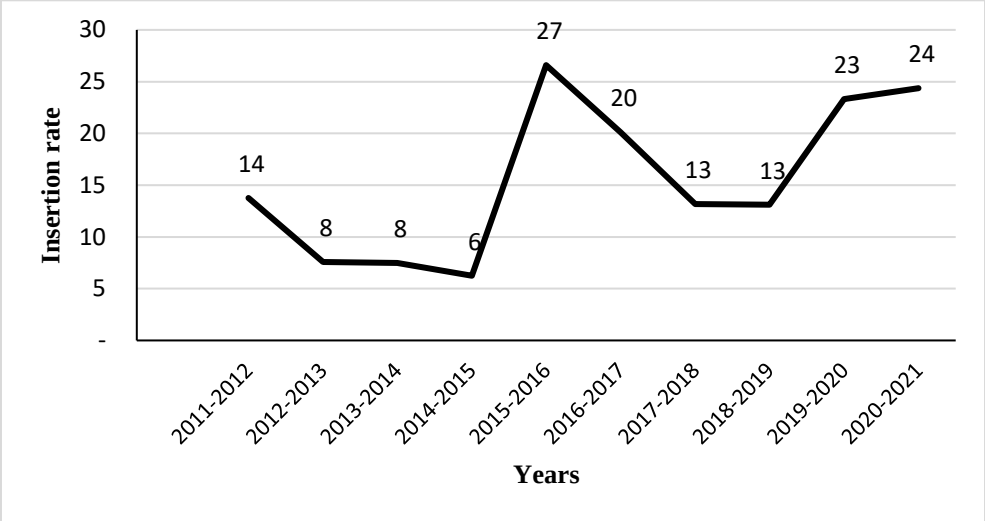

Fig. 3. The overall evolution of the rate of integration of agricultural bachelor degree holders from the FSA into agricultural entrepreneurship between 2011 and 2020

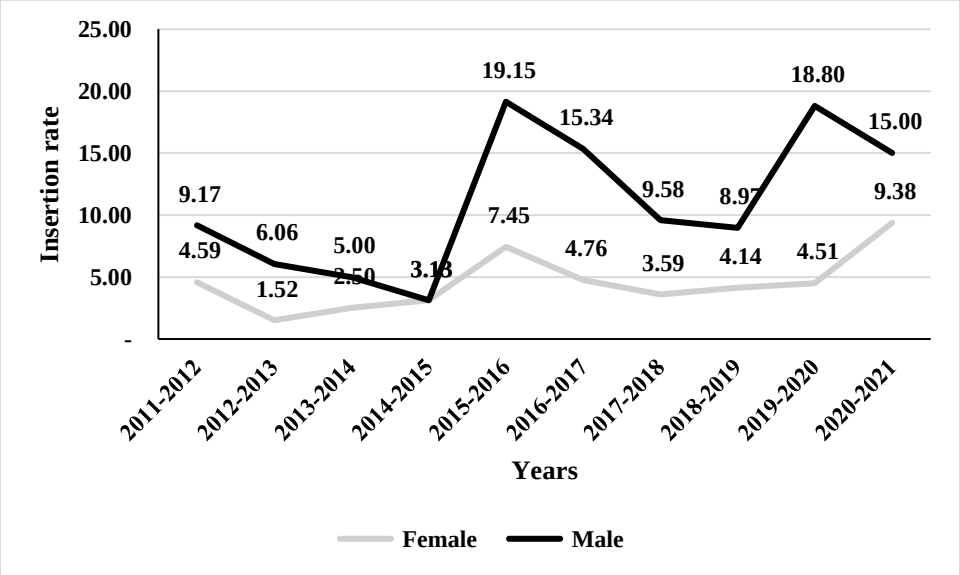

Fig. 4. Evolution of integration rate of agricultural bachelor degree holders from the FSA into agricultural entrepreneurship per year and gender

government (state civil servant) and academic (research center or university civil servant) jobs rather than agricultural entrepreneurship. Taken together, these findings converge with those of Akowedaho et al. [9] Ramesh et al. (2017) in the state of Telangana, where job security was identified as the predominant factor influencing the career choices of students in agriculture, horticulture, veterinary science, and dairy technology, highlighting the desire for stability in career choices.

Based on these remarks, one would state that the poor (less than 17%) integration of agricultural bachelor degree holders from the FSA into agricultural entrepreneurship in Benin can be attributed to several factors. The lack of institutional and governmental support could be an obstacle, with agricultural degree holders not receiving adequate support from educational or governmental institutions to start their businesses. A lack of incubation, funding, and mentoring programs could also deter agricultural undergraduates and graduates from becoming agricultural entrepreneurs. Structural challenges in the agricultural sector, such as the lack of infrastructure, difficulties in accessing agricultural markets, and transport and logistic problems,

could also contribute to these results. Previous studies highlight access to finance, land availability, and government regulations as significant barriers to agricultural entrepreneurship [10]; Akowedaho et al., 2022; [11]; Fiedler, 2020; [12]; 2017; [13]; Kurmanalina et al., 2020). In addition, financial considerations and social stereotypes appear to influence the career choices of graduates, who seem to favor sectors perceived as offering more stable or better-paid employment prospects, such as research, agricultural project management, consultancies, teaching, or agricultural administration. Furthermore, the importance of social structures and cultural values in career decision-making, particularly in contexts where agriculture is perceived as a traditional profession, may explain these results.

4.2 Gender Disparities in Agricultural Entrepreneurship

The above results revealed significant disparities between the integration of men and women agricultural bachelor degree holders into agricultural entrepreneurship. Female graduates account for barely 30% of the number of these undergraduates involved in agricultural entrepreneurship, while male graduates account for about 70%. These results are somewhat similar to those of the OECD, which indicates that, on average, female agricultural entrepreneurs in the nations of Southeast Asia represent 26.7% of the total number of agricultural entrepreneurs in the region [14] (OECD, 2021). In Benin, and more generally in Africa, agricultural entrepreneurship remains a challenge for women. Women entrepreneurs face obstacles arising from discriminatory laws and practices relating to land, family, and inheritance. Even when laws are fair, women may be unaware of their rights or fear negative reactions from patrilineal society if they assert them [15]; FAO, 2010; [16]; Hofmann, 2019. It is uncommon to see women owning farmlands under our skies [17] (Alokpaï et al., 2023). Often, women met in agricultural entrepreneurship belong to agricultural cooperatives. Under these conditions, women, even those with degrees in agronomy, may be reluctant to embrace agricultural entrepreneurship. Moreover, women lag behind men in terms of access to agricultural inputs, services, finance, and digital technologies that are essential for working in agri-food systems [18]; (FAO, 2023).

Furthermore, this article's findings highlight that male agricultural entrepreneurs holding agricultural degrees have consistently outnumbered their female counterparts each year over the study period. This disparity reflects wider trends in society, such as the unequal gender distribution in certain academic fields [19]; (Kouevi et al., 2023) or the challenges faced by women in reconciling career and family.

4.3 Significant Variations in the Yearly Rate of Engagement in Agricultural Entrepreneurship

This paper's results revealed significant variations in the insertion rate of agricultural bachelor degree holders from one academic year to the other, with fluctuations ranging from 6% to 27%. This result indicates unstable economic dynamics at the national level, as well as notable changes occurring annually in the labor market. These fluctuations in the insertion rate also reflect the sensitivity of agricultural entrepreneurship to general economic conditions in Benin. In periods of economic stability, the labor market seems to be more conducive to absorbing graduates, thus encouraging an increase in the rate at which graduates enter agricultural entrepreneurship. Conversely, in periods of economic instability, opportunities in the agricultural sector could be reduced, hurting the entry rate.

4.4 Increasing Rate of Integration

This article highlighted an increase in agricultural entrepreneurship among agricultural bachelor degree holders. Reference to the high underemployment rate of 72%, as reported by the World Bank in 2023, sheds light on these results. Indeed, a job market that is difficult to access and precarious may encourage graduates to explore alternative paths, including agricultural entrepreneurship. Incentives, training programs, or financial facilities [4] designed to encourage agricultural entrepreneurship may also have contributed to this.

5. CONCLUSION

This article aimed to take stock of the integration of agricultural bachelor degree holders from the Faculty of Agricultural Sciences of the University of Abomey-Calavi (FSA/UAC) into agricultural entrepreneurship in Benin. The study covered the period from 2011 to 2020, encompassing a representative sample of 1,305 agricultural bachelor's degree holders. The methodology

adopted involved a survey of the targeted degree holders, facilitating the exhaustive collection of the necessary data. The data were analyzed using Excel version 2019 and STATA version 15. The results highlighted the following facts: a small percentage (16.17%) of agricultural bachelor degree holders enter agricultural entrepreneurship; men (70.48%) are about three times more represented than women (28.69%) as agricultural entrepreneurs; and the integration rate varies significantly from one year to the next, ranging from 6% to 27%. This information adds to the literature on agricultural entrepreneurship and may help to promote it most effectively among agricultural bachelor's and master's degree holders. It may also be of great value to guide educational policies towards encouraging a significant engagement in agricultural entrepreneurship among young agricultural degree holders and ensuring that gender equality is promoted in this field. In addition, the results highlighted that it would be relevant to better understand factors that influence the engagement of young agricultural degree holders in agricultural entrepreneurship, to be able to design quality employment policies for the target youth. Future research may focus on determining such factors.

ETHICAL APPROVAL

The study was covered by an ethical clearance from the National Ethical Clearance Committee of the Republic of Benin.

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COMPETING INTERESTS

Authors have declared that no competing interests exist.

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