Impact of Training in Management and Agricultural Techniques in Cameroon: Evaluation of the "Manage Your Business Better" Training Tool (Germe)

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ABSTRACT

This paper uses the case of the International Labor Office's (ILO) "Manage Your Business Better" (GERME) to assess the impact of training in managerial and agricultural techniques on the income of young people's agricultural activities in Cameroon. A sample of 505 individuals, including 321 participants in the training program and 184 non-participants, was randomly selected from the directory of young people who had applied for the program's training between 2017-2019 in the four intervention regions of the PEA-Jeunes in Cameroon. The Data was analyzed using descriptive statistics (such as mean and frequency) and the Endogeneity Switching Regression (ESR) method. The results showed that participation in the GERME training is influenced by marital status, entrepreneurial training, field of training, agricultural experience and financial status of the individual. Individuals in a relationship were 32.4% less likely to participate in the training, while individuals with a higher level of education had a 40.2% higher probability of participating in the entrepreneurship program training.This is also the case for individuals with managerial background. In addition, an additional year in the individual's agropastoral experience decreases his or her probability of participating in the training program by 0.04%. Furthermore, the results suggest that the GERME training methodology has a positive and significant impact on the income from agricultural activities of the young participants in the PEA-Jeunes program. Individuals participating in the GERME program increase their agropastoral income by 80982 FCFA

Keywords: Training, Agricultural Entrepreneurship, Youth, Impact Evaluation, Income.

INTRODUCTION

The structure of the Cameroonian population shows that it is young. The demographic weight of the different age groups shows a trend towards a younger population in Cameroon. In 2005, more than half of the population was under 17 years of age, whereas the median age in 1976 was 20 years (Bucrep, 2011). According to the UNFPA report, in 2035 the under-25s would still represent more than half of the total population in Cameroon (United Nations Population Fund, 2012). However, Cameroon's demographic growth continues to be a constraint on the labor market. Even if the unemployment rate is less than 6%, the fact remains that underemployment and its constant high rates (79%), especially in rural areas 1 over the past three decades have shown the urgent need for public employment policies. One of the initiatives taken by the Government of Cameroon to combat youth unemployment and underemployment is the priority given to entrepreneurial training and the promotion of small businesses (Minjec, 2015). as an incentive strategy for entrepreneurship. In recent times, efforts have been made to promote

agriculture as a potential sector that can generate sustainable employment for many young people (Adeyanju, 2021). For this reason, the Cameroonian government and development partners have made efforts to promote agricultural entrepreneurship among young people. These efforts are reflected in several programs aimed at encouraging private initiative among young people by strengthening entrepreneurial and agricultural skills (Tagne, 2020). The Program for the Promotion of Youth Agropastoral Entrepreneurship (PEA-Jeunes), the Rural Employment Development Support Program (PADER) and the Support Program for the Installation of Young Farmers (PAIJA) are some concrete examples. Despite the potential benefits of these interventions, there is a lack of empirical evidence on what has and has not worked. This requires further study to measure the effect of the programs on youth and other economic outcomes. It should also be noted that a few studies have been conducted on youth entrepreneurship in Cameroon. However, many of these studies are not sector- specific (Fani, 2021; Tagne, 2020; Wujung, 2019). The few studies that have focused on youth entrepreneurship are not impact evaluation studies (Folefac, 2020; Moahid, 2021). Furthermore, the impact assessment studies found in other contexts (Anang, 2018; Manda, 2019; Mobit, 2016) cannot be generalized to the specific case of Cameroon.

The overall objective of this study is to examine the impact of participation in the training program on the outcome of youth agropastoral activities in Cameroon. The ILO's GERME training program under the PEA-Jeunes is used as a case study.

Specifically, it is about:

- Identify factors that influence participation in the training program;
- Assess the impact of participation in the training program on agropastoral income

Assess the impact of participation in the training program on agropastoral income The results of this study will provide evidence that could inform policies on youth agricultural entrepreneurship in Cameroon. The rest of the document is structured as follows. The next section presents an overview of the PEA-Jeunes. Section 3 presents the theoretical framework for training in entrepreneurship programs. Section 4 presents the materials and methods, detailing the data, sampling procedure and analysis tools. Section 5 presents the results, highlighting the determinants of youth participation in the PEA-Jeunes and the impact of the program on youth farm income.

Intervention (GERME Training in The Framework of The PEA-Jeunes)

The PEA-Jeunes is an agro-pastoral entrepreneurship program created in February 2015 following an agreement signed between the Republic of Cameroon and the International Fund for Agricultural Development (IFAD). The objective of this program is to support the development of profitable enterprises managed by young men and women in promisingagropastoral sectors, to contribute to the development of a successful agriculture, offering viable employment opportunities in rural areas and improving food security. The program's intervention zone covers the production basins of the Centre, Littoral, North-West and South regions. The PEA-Jeunes mentoring process aims to identify young entrepreneurs in the production basins and to accompany them until the creation of their enterprise. Since 2017, this process has been strengthened by the integration of the ILO's GERME training methodology into the youth support system. The Manage Your Enterprise Better (GERM E) training methodology

is a management training tooldeveloped by the International Labor Organization (ILO) with a focus on creating and improving small businesses as a strategy to create more quality jobs for women and men, particularly in emerging economies. Within the framework of the PEA - Jeunes, the GERME training program aims to provide specific entrepreneurial and agricultural skills to young men and women wishing to establish themselves in agriculture on a sustainable basis or to develop their agricultural activities. The GERME training methodology is based on three components: "Find your Business Idea" (TRIE), "Create your Enterprise (CREE) and "Manage your Enterprise Better" (Germe).

Theoretical Framework

The provision of training in agricultural entrepreneurship program is based on theoretical analyses of human capital. Human capital theory as understood today originated in the 1960s with the work of (Becker, 1964 & Schultz, 1961) For these authors, human capital refers to the stock of physical and intellectual knowledge and skills that enable an individual to participate in productive activities. In other words, human capital is the sum of the capabilities acquired and learned by an individual over time, so as to improve their productive efficiency. Thus, an investment in education, training or health enables an individual to improve his or her productive efficiency. This theory postulates that individuals with high human capital tend to be more productive. In turn, individuals with low human capital are likely to be less productive. According to the analyses of (Becker, 1964) in the study of the economic determinants of human behavior, there are two types of training aimed at improving human capital: general training and specific training. This article focuses exclusively on specific training, as this is what is implemented in public entrepreneurship programs. Specific training refers to further education, vocational training and the experience of the individual. It allows, through productive capacity building, to improve the skills of individuals, thus contributing to production and productivity (Cho, 2014). However, in the agricultural entrepreneurship sector, a distinction must be made between agricultural training and management training. Agricultural training refers to a tool that helps farmers through didactic procedures3 to develop agricultural methods and techniques, increase production efficiency and income, improve their standard of living and foster rural development (Sienso, 2021). It is a process of introducing farmers to knowledge and technological innovations aimed at improving agricultural production and productivity, as well as income and welfare. Its strategy is to equip farmers with knowledge and technological innovations to build their capacity so that they are able to adopt and adapt new technologies on their farms. Specifically, agricultural training improves knowledge through skill building on the use of agricultural inputs and on the management of farming systems. For example, it is the main channel for acquiring knowledge about the use of fertilizers by farmers. This knowledge enables farmers to master how to apply fertilizers properly and how they can affect crops. Managerial training on the other hand can be considered as training in business creation and management, including starting, improving, managing and developing businesses as well as acquiring managerial skills. It is a coaching process that aims to strengthen the knowledge and good business practices of potential (Tagne, 2020). As such, it is crucial for business performance and

growth, as it generally has a positive impact on existing and aspiring entrepreneurs, particularly in terms of improving business practices (Afari, 2018). Empirical evidence show that management training improves business performance through strengthening the knowledge, skills and competences of potential entrepreneurs in management, finance and marketing (Adeyanju, 2021; Schultz, 1961). Specifically, it improves entrepreneurs' business practices such as record keeping of business transactions. It also improves skills such as inventory management, cash flow, payments, collections, profits and costs. Finally, it develops business and marketing skills.

METHODOLOGY

The primary data used in this article is from the "Survey on the monitoring and use of the International Labor Office (ILO) GERME tools in the framework of the Programme for the Promotion of Youth Agropastoral Entrepreneurship (PEA - Jeunes)". The survey was conducted between January and March 2019. It covered four main regions of intervention of the PEA-Jeunes in Cameroon. These are the Centre, Littoral, North West and South regions. The choice of these regions is based not only on the numerical importance of young people but also on agro-climatic potential, the dynamics of farms, the existence of training and monitoring structures for agricultural trades. This survey was based on two groups of statisticalunits. The first is composed of all individuals who participated in the GERME training programme at PEA-Jeunes (treatment) and the second is composed of individuals who did not participate in the programme (control).

Both statistical units were obtained from a sample of 505 individuals from the register of young people who sought the programme intervention between 2017-2019. The random selection of the treatment and control groups was done using randomnumbers generated from Microsoft Excel. Thus, the treatment group consists of 321 individuals and the control group is estimated at 184 individuals.

Assessing the impact of program participation on farm income using non-experimental data is quite difficult, due to unobserved counterfactuals, (i.e. what would have happened if a young person had not participated), is usually not observed, which implies a missing data problem. Previous studies have used propensity score matching (PSM) and single-equation binary models such as probit or logit models to assess the impact of interventions. For example, the PSM method was used to assess the impact of the Masara N'Arziki project on farmers' income in northern Ghana (Heckman, 2004). However, this method has been criticized in the literature for not taking into account unobservable characteristics, which calls into question the validity of the impact estimates. Similarly, the use of binary models such as the logit does not account for endogeneity and leads to inconsistent estimates. From an econometric perspective, the issue of endogeneity arising from self-selection bias poses a challenge in program evaluation. To address the issue of endogeneity, this study used the Endogeneity Switching Regression (ESR) method to assess the impact of program participation on farm income.

The ESR model simultaneously estimates two separate outcome equations for participants and non-participants and a selection (participation) equation specified as follows:

$$Z_i = \beta X_i + u_i \qquad (1)$$

Where Z_i is a binary variable that equals 1 if a young person has participated in the programme and 0 otherwise. □ is the vector parameter to be estimated. X_i represents the other covariates determining participation. In this study, the first step is to obtain inverse Mills ratios (rho) to correct for endogeneity in the farm income estimates. The first step therefore distinguished participants from non-participants using a probit model. The decision to participate in the programme was measured as a dichotomous variable that takes the value of 1 if a youth participated and 0 otherwise. From equation (1), the participation equation was specified as expressed in equation (2): Let P* be the latent variable that captures the expected benefits of participation in the GERME training programme compared to non-participation. We specify the latent variable as follows:

$$P_i^* = \beta Z_i + \varepsilon_i \text{ avec } \begin{cases} P_i = 1 \text{ si } P_i^* \succ 0 \\ P_i = 0 \text{ si } P_i^* \leq 0 \end{cases} \qquad (2)$$

Where P* is the observed situation of the individual in the context of agricultural entrepreneurship. if the latent process captured by is associated with the individual who participates in the program and 0 if it is associated with those who do not participate. The participation-conditional outcome equations can be presented as two regimes ((Di Falco et al., 2011; Manda et al., 2019)):

$$\text{Régime 1 (Participants): } Y_P = X_i \beta_P + \mu_P, \text{ si } P_i = 1 \quad (3)$$

Régime 2 (Non participants):

$$Y_{NP} = X_i \beta_{NP} + \mu_{NP} \text{ si } P_i = 0 \qquad (4)$$

Where Y_P and Y_{NP} are outcome variables for participants and non-participants, respectively; X_i is the vector of exogenous variables; μ_P and μ_{NP} are the error terms.

The inverse of the Mills ratio or the selectivity terms (λ_{1i} et λ_{2i}) can be included in equation (1) to correct for selection bias. This study uses the efficient full information maximu m likelihood estimation procedure to estimate the endogenous switching model described above. The full information maximu m likelihood procedure also generates correlation coefficients of the error terms of the selection and outcome equations (*corr* (ε ,μ) =ρ). Endogenous switching occurs if ρ_P and ρ_{NP} (which are the correlation coefficients for participants and non-participants, respectively) are non-zero [2]. The signs of the correlation terms have an important economic interpretation [Abdulai, 2014; Lachaud, 2018]. If ρ_P 0 ,, this implies a positive selection bias, suggesting that agricultural entrepreneurs with above-average incomes are more likely to participate in the programme. On the other hand, if ρ_{NP} 0 this implies a negative selection bias Although the model can be identified by instruments generated automatically by the non-linearity of the selection equation model (1), it is important that the variables X of the

selection model contain a variable as an instrument, such that it influences participation in the programme and only indirectly affects the income of the agricultural activities through participation in the programme for a more robust identification. This study uses membership of a professional agricultural organisation (measured as 1, if the entrepreneur is a member of an organisation and 0 otherwise) as an instrument (Abdallah, 2019; Agbodji, 2019; Kamdem, 2018). The validity of the instrument is established by performing a falsification test. An instrument variable is valid, when it affects the decision to participate in the programme, but does not affect the outcome variable among entrepreneurs who do not participate in the programme (Di Falco, 2011). Table II shows that the farm organisation membership variable can be considered as a valid instrument: This variable is statistically significant in the selection equation but not significant in the outcome equation for non-participants. To estimate the impact of programme participation on income from agricultural activities, we estimate the expected values of the outcome variable for participants and non- participants. For an agricultural entrepreneur participating in the programme, the expected value of the outcome variable is expressed as follows:

$$E(Y_{1i}|P_i =1) = X_{1i}\beta_1 + \sigma_{1\varepsilon}\lambda_{1i} \qquad (5)$$

The expected value for an agricultural entrepreneur not participating in the programme is given as follows:

$$E(Y_{2i}|P_i =0) = X_{2i}\beta_2 + \sigma_{2\varepsilon}\lambda_{2i} \qquad (6)$$

The expected value of an agricultural entrepreneur participating in the programme, had he not participated, is given as follows:

$$E(Y_{2i}|P_i =1) = X_{1i}\beta_2 + \sigma_{2\varepsilon}\lambda_{1i} \qquad (7)$$

The expected value of a non-participating agricultural entrepreneur, if he had participated, is given as follows:

$$E(Y_{1i}|P_i =0) = X_{2i}\beta_1 + \sigma_{1\varepsilon}\lambda_{2i} \qquad (8)$$

The impact of participation in the AEP-Youth programme on income from agricultural activities for those who participated in the programme, i.e. the average treatment effect on the treated (ATT) is calculated as the difference between the following equations (5) and (7).

$$TT = E(Y_{1i}|P_i =1) - E(Y_{2i}|P_i =1)$$
$$X_{1i}(\beta_1 - \beta_2) + (\sigma_{1\varepsilon} - \sigma_{2\varepsilon})\lambda_{1i} \qquad (9)$$

Similarly, the calculation of the treatment effect on the non- treated (TU), i.e individuals who did not actually participate in the programme, is calculated as the difference between (6) and (8):

$$TU = E(Y_{1i}|P_i = 0) - E(Y_{2i}|P_i = 0)$$
$$X_{2i}(\beta_1 - \beta_2) + (\sigma_{1\varepsilon} - \sigma_{2\varepsilon})\lambda_{2i} \qquad (10)$$

The evaluation of the impact of the GERME training programme on the income of young people's agricultural activities required the use of three types of variables: pre- treatment variables that describe the characteristics of the individual, a treatment variable and an outcome variable. The treatment variable, which is binary, is equal to 1 if the individual participated in the GERME training programme and 0 otherwise. In other words, an individual is considered to have participated in the programme if he or she has benefited from the TRIE, CREE and GERME training tools (P=1). The control group is composed of individuals who applied for the training but did not receive it (P=0). The outcome variable being income, in terms of turnover is expressed as the total amount of money that the sale of the production brought in (Adeyanju, 2021; Minjec, 2015; Shimba, 2018).

RESULTS AND DISCUSSION

This subsection presents a discussion of the estimated coefficients of the training participation equation. These estimates are presented in Table I. The factors influencing youth participation in the GERME training program are consistent with existing work in the literature (Adeyanju and al., 2021; Mobit and Mbella, 2016; Tambwe, 2015). In line with the work of Heckman and Smith (2004), educational attainment has a positive and significant influence on participation in the training programme. This can be attributed to the ease of access to information about the existence of social programmes. Indeed, educated individuals are more likely to acquire information about the programmes in place. Also, managerial training has a positive and significant influence on programme participation. Indeed, individuals with prior professional training in entrepreneurship are also more likely to have information about the existence of agricultural entrepreneurship programmes. Agropastoral experience also has a significant positive influence on programme participation. This is in line with the study who show that an individual's age and experience are indicators of maturity (Shimba, 2018).

Table 1 EXPLANATORY FACTORS OF PARTICIPATION IN THE GERME TRAINING PROGRAMME			
	Agricultural income		
Variables	Training=1	Training=0	Participation
Age	21,849	392.8	-0.103
	-42,532	-1,333	-0.203
Age squared	-40,533	-789.1	0.153
	-71,403	-2,163	-0.338
Marital status	-6,935	2,078**	-0.324**
	-31,785	-985.6	-0.136
Familly Background	359.9	-431.4	-0.0117
	-31,942	-992.6	-0.143
Secondary education	59,358	798.1	-0.0109
	-55,176	-1,541	-0.239
Higher education	79,933	293.9	0.402*

	-54,854	-1,550	-0.239
Agropastoral training	40,158	-2,636*	-0.309
	-45,436	-1,431	-0.192
Management training	-74,572**	2,707*	0.443**
	-34,066	-1,591	-0.178
Area of specialization	59,819	2,810	0.31
	-46,854	-1,712	-0.216
Agropastoral experience	11,311***	255.0**	-0.0436**
	-4,148	-128.3	-0.0174
Activity environment	-55,081	-1,694*	0.101
	-35,327	-959.6	-0.143
Main activity	-68,962	3,462*	1.366***
	-42,122	-1,947	-0.154
Financial situation	100,548***	-256.6	-0.0949
	-37,682	-1,233	-0.166
Sex	5,812	743.4	0.124
	-32,188	-948.9	-0.142
Agricultural organisation			-0.505***
			-0.159
Constante	-2,51,468	-5,150	1.656
	-6,22,121	-20,591	-3.014
Diagnostic du modèle			
Sigma *i*	12,44***	8.667***	
	-0.0396	-0.0542	
Rho *i*	-0.0411	0.103	
	-0.178	-0.232	
Observations	**321**	**184**	**505**

Source: Based on ESR model estimates
Note: Values in brackets correspond to robust standard deviations. *** p<0.01, ** p<0.05, * p<0.1

Estimating the Impact of Training in the Program

Table II presents the average income from agricultural activities of entrepreneurs in the real and counterfactual conditions. Cells (a) and (b) represent the average income from farming activities observed in the sample. The average farm income of young entrepreneurs who participated in the training is about 80982 FCFA compared to 1295 FCFA for young entrepreneurs who did not participate in the training. However, this simple comparison can be misleading and leads to the conclusion that on average, the agricultural entrepreneurs participating in the training earned about 79687 FCFA more than the agricultural entrepreneurs who did not participate in the training. In the counterfactual case (c), the agricultural entrepreneurs who actually participated in the training would have earned about 3596 FCFA if

they had not participated in the training. In the counterfactual case (d), where the farm contractors who did not participate in the training would have earned about 127709 FCFA if they had participated.

These results imply that participation in the GERME training at PEA-Jeunes significantly increases income from agricultural activities. These results are in line with those obtained by Adeyanju et al in Nigeria (Fuglie, 1995; Lachaud et al., 2018; Kamdem, 2018), Ndour Senegal (Nakano, 2018) and Mariyono Indonesia (Manda, 2019) among others, which showed that participation in a training programme has a positive impact on the agricultural performance of participants. The results of this study confirm the hypothesis that participation in an agricultural and management training programme has a positive impact on the income of young people's agricultural activities. With the successive increase in participants' incomes, the evidence presented so far supports the idea that state intervention in agricultural entrepreneurship is an effective tool for fighting rural poverty.

Table 2 EXPECTED AVERAGE FARM INCOME AND TREATMENT EFFECT (ESR MODEL)			
	Training		Treatment effects
	Participating	Not participating	
Participants in the training	(a) 80.982	(c) 3596	TT=77.396
	-5094.003	-170.82	-5096.86
Non participants in the training	(d) 127.709	(b) 1295	TU=126.414
	-5179.31	-164.424	-5181.927
Heterogeneity effects	-46.726	2.29	TH= -
	7788.559	257.7349	49.018***
Source: Based on ESR model analyses Note: Values in brackets correspond to robust standard deviations. *** p<0.			

CONCLUSION AND RECOMMENDATIONS

The main research question analyzed in this work is whether participation in training programmes has an impact on the income of young people's agricultural activities. The results indicate that participation in the PEA-Youth GERM E training is positively influenced by the variables of managerial training, field of training, agricultural experience and financial status of the individual, while it is negatively influenced by marital status and membership of an organisation. With regard to the main objective of the research, the results imply that, on average, participation in the LEP-Youth GERM E training increased the income of young people's agricultural activities. This suggests that training initiatives aimed at increasing the agricultura income of young people should be strongly encouraged. From a public intervention perspective, policy makers and other development partners need to take into account the different factors that promote or hinder youth participation in agricultural entrepreneurship and make greater use of training as a means to increase youth farm income.

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