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Empowerment of Rural Young People in Informal Farm Entrepreneurship: The Role of Corporate Social Responsibility in Nigeria's Oil Producing Communities

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Empowerment of Rural Young People in Informal Farm Entrepreneurship: The Role of Corporate Social Responsibility in Nigeria's Oil Producing Communities

Joseph I. Uduji & Elda N. Okolo-Obasi

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Abstract

Purpose – The purpose of this paper is to critically examine the corporate social responsibility initiatives of multinational oil companies in Nigeria. Its main focus is to investigate the impact of the global memorandum of understanding (GMoU) on equipping the rural young people with essential farming skills and knowledge for adoption and application of modern agricultural inputs in the Niger Delta region.

Design/methodology/approach – This paper adopts a survey research technique, aimed at gathering information from a representative sample of the population, as it is essentially cross-sectional, describing and interpreting the current situation. A total of 800 rural young people were sampled across the oil producing region.

Findings – The results from the use of combined propensity score matching and logit model indicate that the GMoU model has a significant impact on development of informal farm entrepreneurship generally, but somewhat undermined rural young people in the targeted agricultural clusters.

Practical implications – This suggests that youth-specific CSR farm projects can be effective in providing young people with the extra push needed to tackle the knowledge gap and poor agronomic that erect the below-per yield and lack of competitiveness of small-holder farmers in the region.

Social implications – It implies that a coherent and integrated CSR response from business would be necessary to unlock investment opportunities on young people in farms for agricultural competitiveness and food security in Africa.

Originality/value – This research adds to the literature on informal farm entrepreneurship and rural communities' debate in sub-Saharan Africa. It concludes that business has obligation to help in solving problems of youth unemployment in developing countries.

Keywords: Global memorandum of understanding (GMoU), Rural young people, Informal farm entrepreneurship, sub-Saharan Africa.

Paper type Research paper

1. Introduction

Global population is projected to reach 9 billion by 2050; the number of young people (aged 15 to 24) is also expected to increase to 1.3 billion by 2050, accounting for almost 14 percent of the projected global population (Bloom, 2012; ILO, 2012). Most will be born in developing countries in Africa and Asia, where more than half of the population still live in rural areas (Benson & Pittman, 2001). Rural youth continue to face challenges related to unemployment, underemployment and poverty (African Development Report, 2015). Despite the agricultural sector's ample potential to provide income-generating opportunities for rural youth, challenges related specifically to youth participation in this sector, and more importantly, options for overcoming them are not extensively documented (Filmer & Fox, 2014).

Meanwhile, the Nigerian economy is heavily reliant on the oil sector. It is estimated that the oil and gas sector in Nigeria accounts for over 95% of the foreign export earnings and 65% of the Nigerian government revenue (FGN, 2017; IMF, 2017). The Niger Delta where the multinational oil companies (MOCs) maintain a significant presence has become a theatre of incessant violent conflicts. This has contributed to the rise of militant youth groups that align themselves with traditional rulers and engage in sabotage of oil company equipment (and violence with competing groups) in order to extract concessions and compensations from the oil companies for their communities (Uduji *et al,* 2018b). The environmental destruction which has accompanied oil extraction, along with the relationship between MOCs and the Nigerian government, and lack of oil revenue sharing, has led to these grievances being amplified and directed toward oil companies (NDDC, 2004; Eweje, 2006; Uduji *et al,* 2020a, 2020b).

Confronted with the dynamics of the Niger Delta and the challenges of ensuring sustainable development in the communities around their operation, in 2006, MOCs adopted the Global Memorandum of Understanding (GMoU) to achieve their goal of significantly contributing to improving the quality of life in the Niger Delta (Ite, 2007a). Under the GMoU approach which is predicated on mutually negotiated agreements, planning and execution of community development programmes is now the responsibility of the Regional Development Communities (RDCs) (Chevron, 2014). These committees work with the communities to produce development plans that are designed to improve their livelihood (Uduji *et al,* 2019c). The GMoUs define and guide the spirit of relationship and partnership among stakeholders (SPDC, 2013). The GMoU ensures sustainable community-driven development process, institutionalizes the spirit of partnerships, economic empowerment and human capacity

building; it has brought remarkable socio-economic benefits to communities around the MOCs operations in Nigeria (Chevron, 2014). The GMoU is predicated on the following principles: participatory partnership and stakeholder engagement; transparency and accountability; sustainability assurance; peace building; monitoring and evaluation (SPDC, 2013). According to Chevron (2017), the GMoU has generated over 258 projects in more than 400 communities, villages and chiefdoms and benefited over 600,000 people; projects worth more than $83 million have been completed, enhancing the quality of life in these communities.

However, the extent to which the GMoU initiatives have contributed to the community development in the region remain contested. For example, scholars such as Idemudia (2014), Frynas (2009), Eweje (2006) and others have argued that the GMoU initiatives have failed to contribute to community development and in some instances have caused inter-and intra-community conflicts. In contrast, Ite (2007b) suggested that the GMoU initiatives have actually contributed to community development given the extent of governmental failure. He further emphasized that MOCs have continually improved upon their GMoU initiatives so as to better respond to the needs of their host communities (Ite, 2007a). Yet, Uduji & Okolo-Obasi (2018c, 2018d) recently added some nuance to the debate as they suggested that the GMoU initiatives have somewhat contributed to agricultural development, but also undermined gender equality. Similarly, Uduji *et al* (2019b) noted that the rural women depended on GMoU of MOCs for policy dialogue and advocacy for women's access to agricultural land and inputs.Meanwhile, decades of oil spillage and gas flaring as well as rapidly growing population, has meant that the traditional source of livelihood of the people (farming and fishing) are either no longer viable or have experience significant decline (Uduji & Okolo-Obasi, 2017; Uduji *et al,* 2018b; Uduji & Okolo-Obasi, 2018b; UNDP, 2006). Hence, this paper contributes to debate on youth and sustainable agriculture development in sub-Saharan Africa, from the CSR perspective in three areas that have received much attention in the literature. The three areas of focus equally represent three main questions, notably:

i. What is the level of multinational oil companies' GMoU intervention in capacity building programmes for rural young farmers in the Niger Delta, Nigeria?
ii. Do multinational oil companies' GMoUs interventions impact on equipping the rural youths with essential farming skills and knowledge for adoption and application of modern agricultural inputs (improved seeds, fertilizer, crop

protection chemicals, machinery, irrigation and other farming technical knowledge) to sustain the traditional source of livelihood of the people of Niger Delta, Nigeria?

iii. What are the consequences of empowering rural young people in informal farm entrepreneurship in sub-Saharan Africa?

1.1 Study Hypothesis

Rural youths are the future of food security. Yet in the Niger Delta, few young people see a future for themselves in agriculture or rural areas. They migrate to cities in search for employment in oil companies, leaving the farms for the weak and feeble. Thus, we hypothesize that GMoUs interventions of MOCs has not significantly impacted on equipping the rural youths with essential skills on adoption and application of modern agricultural inputs for sustaining the traditional source of livelihood of the Nigeria's oil host communities.

The positioning of this research diverges from contemporary informal entrepreneurship and corporate social responsibility literature which has focused on, *inter alia:* on ICT, innovation and firm performance Rashiti *et al,* 2017); impact of e-wallet on informal farm entrepreneurship (Uduji *et al,* 2019d); women's participation in traditional enterprises (Okolo-Obasi *et al,* 2021); rural young people in cultural tourism (Uduji *et al,* 2019e); entrepreneurship in Bolivia (Dana, 2011); informal ethnic entrepreneurship (Ramadani *et al,* 2019); social capital formation in EU ICT SMEs (Nikopoulos & Dana, 2017); Nigerian growth enhancement scheme (Uduji *et al,* 2019f); enterprise in Rankin Inlet, Nunavut (Mason *et al,* 2009); a humility-based enterprising community (Dana, 2007a); women in sustainable agricultural development (Uduji *et al,* 2019g); transfer pricing and corporate social responsibility (Asongu *et al,* 2019a); the role of rural women in sustainable agricultural development (Uduji *et al,* 2019b); HIV/AID response in oil host communities (Uduji *et al,* 2019h); revisiting Carroll's CSR pyramid from African perspective (Visser, 2006); thresholds of external flows for inclusive human development (Asongu *et al,* 2019b); rural women in livestock keeping (Uduji & Okolo-Obasi, 2018d); the issue of reciprocal responsibility and its implication for corporate citizenship (Idemudia, 2014); development of women in small-scale fisheries (Uduji & Okolo-Obasi, 2018c); tourism and insecurity (Asongu *et al,* 2019c); enabling environment of small-holder farmers (Uduji *et al,* 2019i); partnering with the State for sustainable development (Ite, 2007b); development of rural young people in cultural tourism (Uduji *et al,* 2018b); foreign aid volatility (Asongu *et al,* 2020d); environmental cost responsibilities resulting from oil exploitation (Eweje, 2006); farmers' fertilizer use in rural areas (Uduji *et al,* 2019j); homicide

and social media (Asongu *et al,* 2019d); the need of rural farmers (Uduji & Okolo-Obasi, 2017); persistence of weapons (Asongu *et al,* 2020a); towards addressing the peculiarity of the socio-economic development challenges (Amaeshi *et al,* 2006); drivers and persistence of death (Asongu *et al,* 2020e); the prevalent issues in the continent (Muthuri, 2012); fighting African capital flight (Asongu *et al,* 2020b); human trafficking in oil producing communities (Uduji *et al,* 2019k); social challenges of oil multinationals (Frynas, 2009);political instability (Asongu *et al,* 2020c); self-service technologies (Ugwuanyi *et al,* 2021); women participation in the offshore and inshore fisheries entrepreneurship (Uduji *et al,* 2020c) and promoting SMEs in Africa (Dana, 2007b). However, this paper differs from the extant literature by explicitly noting the relationship that exists between corporate social responsibility of multinational oil companies and rural young people in informal farm entrepreneurship in oil host communities in Nigeria.

The rest of the paper is organized as follows. Section 2 considers the background, literature and theoretical underpinnings. Section 3 describes the materials and methods. Section 4 presents the results and the corresponding discussion. Section 5 concludes with policy implications, caveats, and future research directions.

2. Background, literature and theoretical underpinning

2.1 Background

The Niger Delta is a vast 70,000 km^2 oil basin in the Southern part of Nigeria and consists of nine administrative states (Figure 1).The history of oil production in the region has been marked by highly contentious relationships between oil companies and the host communities, often leading to interrupted operations and violence (Uduji *et al,* 2018b; Idemudia, 2014; UNDP, 2006). In 2005, amidst violent clashes between age long ethnic rivals, many MOCs community development projects and production facilities were either damaged or destroyed; as a result, MOCs introduced the Global Memorandum of Understanding (GMoU) in the region (Chevron, 2014). The GMoUs were signed between clusters of communities, MOCs and State governments, creating a unique public – private model to promote economic and social stability. Through the GMoUs the community eventually assumed responsibility and accountability for how to use funding provided by the MOCs and for implementing the projects selected (SPDC, 2013). MOCs stay involved by participating on local communities and boards that review and approve projects and, by providing annual project funding. This public–

private participatory development process helped to resolve conflict and addressed the community needs in the region (Chevron, 2014; Uduji *et al,* 2020d, 2020e).

Figure 1. Constituent Administrative States of the Niger Delta, Nigeria

Working with non-governmental organization (NGOs) and State and Local governments, MOCs helped to form Regional Development Committees (RDCs) for each GMoU. The RDCs are composed of elected community members who represent local interests and oversee GMoUs implementation in a specific region (Uduji *et al,* 2019c). The GMoU process established guiding principle of partnership, transparency, accountability, sustainability assurance, peace building and project monitoring and evaluation (SPCD, 2013). The GMoU model continues to evolve. In 2015, MOCs launched GMoU+ to build upon the communities' focus on infrastructure projects. This expanded model strives to increase capabilities of various clusters, household incomes, employment and development of small business; it aligns GMoU projects and programmes with the United Nations Sustainable Development Goals to improve health, education and gender equality, and promote peace and justice (Chevron, 2017). By the end of 2012, MOCs have signed agreements with 33 GMoU clusters, covering 349 communities, which are about 35% of the local communities around their business operations (SPDC, 2013; Uduji *et al,* 2020f, 2020g).

2.2 Literature

2.2.1 Agricultural productivity

Agriculture employs more than half of the total labour force and within the rural population, provides a livelihood for multitudes of small-scale producers (ILO, 2012; Filmer & Fox, 2014). Smallholder farms constitute approximately 80% of all farms in sub-Saharan Africa and employ about 175 million people directly (World Bank, 2014; AGRA, 2014; African Development Report, 2015). In spite of its dominant role, agricultural productivity is low and the people depending on agriculture are generally poor. According to Uduji & Okolo-Obasi (2017), increased productivity in the agriculture sector mandates that sub-Saharan Africa farmers move from the traditional mode of agricultural production to one based on science and technology. Science-based agriculture is embodied in the use of modern inputs such as improved seed, fertilizers, crop protection production (CPPs), machinery, irrigation and knowledge, and other agronomic practices (Uduji *et al,* 2019b). Seeds are critical to successful crop production and inevitably, farm productivity and profitability (Uduji & Okolo-Obasi, 2018a). Fertilizer supplies nutrients to the soil that are essential for growth (Uduji *et al,* 2018a). Increased use of fertilizer and improved seeds are partially credited with a large increase in agriculture productivity growth in Asia during the Green Revolution in the 1960s (Bi, 2014). Irrigation is also essential for growth as it enables off-season farming, provides the potential for multiple harvests per year, and brings additional land under cultivation (Uduji & Okolo-Obasi, 2018b). Crop protection products (pesticides, herbicides, insecticides and fungicides) control weed species, harmful insects and plant diseases that afflict crops (Uduji *et al,* 2019a). Technical knowledge and machinery enhance human labour effectiveness and increase farm productivity (Uduji & Okolo-Obasi, 2017).

2.2.2 Young people and farming

Previous studies show that global population is expected to increase to 9 billion by 2050, with youth (aged 15-24) accounting for about 14 percent of this total (FAO/CTA/IFAD, 2014, Uduji *et al,* 2021a, 2021b). While the world's youth cohort is expected to grow, employment and entrepreneurial opportunities for youth – particularly those living in developing countries' economically stagnant rural areas-remain limited, poorly remunerated and of poor quality (AGRA, 2015; Bloom, 2012). Rural youths face many hurdles in trying to earn a livelihood (Uduji *et al,* 2020a, 2020b; Dana, 2007a, 2007b). For example, pressure on arable land is high in many parts of the world, making it difficult to start a farm (Uduji & Okolo-Obasi, 2018a, 2018b, 2019b, 2019c). Rural young people often also lack access to credit, and many other

productive resources necessary for farming (Dana, 2000a, 2000b, 2011). To make a living, the youths in sub-Saharan Africa face four options: to obtain high level of education which is not accessible to many of them; to go back to unattractive rural farming; to become self employed by learning a trade; or to opt for migration (Uduji *et al,* 2019a, 2019b, 2019c). According to Chinsinga & Chasukwa (2012), in many rural areas, agricultural knowledge and farming know-how are passed on from parents to children; hence rural youths are the future of food security in Africa. Yet in sub-Saharan Africa, few young people see a future for themselves in agriculture or rural areas (Sumberg *et al,* 2012). Rural youths in sub-Saharan Africa face many hurdles in trying to earn a livelihood (Mwaura, 2017). Pressure on arable land is high in many parts of sub-Saharan Africa, making it difficult to start a farm (te Lintelo, 2012). Youth often also lack access to credit, and many other productive resources necessary for agriculture (Anyidoho *et al,* 2012). Youth's access to knowledge and information is crucial for addressing the main challenges they face in agriculture (Uduji and Okolo-Obasi, 2018a, 2018b; Uduji *et al,* 2018a).

While most of the Africa's food is produced by (aging) smallholder farmers in sub-Saharan Africa, older farmers are less likely to adopt the new technologies needed to sustainable increase agricultural productivity, and ultimately feed the growing Africa's population while protecting the environment (Tadele & Gella, 2012; Ariyo & Mortimore, 2012; Fernadez, 2012; White, 2012). Hence, the need to re-engage youth in sustainable agricultural development in the region. In Nigeria's Niger Delta,rural youths, associate subsistence and even potential commercial farm activities with hard physical labour and drudgery, and are disenchanted and disillusioned with the meager opportunities for a rural livelihood (Idemudia, 2014; Uduji & Okolo-Obasi, 2017; UNDP, 2006). This has created an incentive for most youths in the region to migrate to cities like Port-Harcourt and Warri, leaving the farm for the aged parents and thus worsening an already marked low productivity in the farms (Uduji & Okolo-Obasi, 2018b). This further justifies the need to re-engage the rural youths in the farms. Hence, this study seeks to examine the impact of GMoU interventions on equipping the rural young people with essential farming skills and knowledge for adoption and application of modern agricultural inputs in the Niger Delta region of Nigeria.

2.2.3 Informal entrepreneurship

Previous studies indicate that most of the existing entrepreneurship literature focuses on formal enterprise but more recently more attention has been placed on informal entrepreneurship (Ramadani *et al* 2019; Dana & Dumez, 2015, Dana *et al,* 2005, 2008, 2009,

2018).Entrepreneurship usually implies law abiding activity, but informal entrepreneurship can involve unauthorized or illegal entrepreneurship activity that can include tax evasion and self-employment (Rashiti *et al,* 2017; Nikolopoulos & Dana, 2017; Dana, 2011; Ramadani *et al,* 2019; Dana, 2007). The informal economy provides individuals with business opportunities regardless of immigration status or educational qualifications and this is especially important to entrepreneurs (Ramadani *et al,* 2019; Mason *et al,* 2019; Dana, 2000a, 2000b, 2007a, 2007b). In the context of this paper, informal sector farmers are defined as those that are not legally registered with the cluster development boards (CDBs) of the multinational oil companies' (MOCs) global memorandum of understanding (GMoUs) programmes, although could be connected to a registered family member (Uduji *et al,* 2019a, 2019c, 2019f, 2019g).

2.3 Theoretical underpinnings

This paper explores the nature of corporate social responsibility (CSR) in a rural African context. Carrol (1991) CSR Pyramid is probably the most well-known model of CSR, with its four levels indicating the relative importance of economic, legal, ethical and philanthropic responsibilities respectively. However, the exploration of CSR in Africa by Visser (2006) has been used to challenge the accuracy and relevance of Carroll's CSR Pyramid in Africa. Muthuri (2012), relying on the extant literature on CSR in Africa, posited that the CSR issues prevalent in Africa include poverty reduction, community development, education and training, economic and enterprise development, health and HIV/AIDS, environment, sports, human rights, corruption and governance and accountability. Amaeshi *et al.* (2006) argue that CSR in Nigeria is specifically aimed at addressing the socio-economic development challenge of the country, including poverty alleviation, health-care provision, infrastructure development, and education; which stands in stark contrast to many Western CSR priorities such as consumer protection, fair trade, green marketing, climate change concerns, or socially responsible investments. Yet, Uduji and Okolo-Obasi (2018c) find that CSR in rural Nigeria is framed by socio-cultural influences like culture and traditions and suggests that the value-based traditional philosophy of Africans underpins much of the modern inclusive approaches of CSR in the continent. However, these findings remain speculative and provocative, and would therefore benefit from further empirical research. This study adopts quantitative methodology, but discusses the outcome from the African CSR perspective.

3. Materials and methods

The study adopts quantitative methodology, as a contribution given the paucity of quantitative works in the region (Uduji and Okolo-Obasi, 2017; Uduji *et al,* 2018b; Uduji *et al,* 2019c, 2021a, 2021b). The survey research technique was used with the aim of gathering cross-sectional information from a representative sample of the population. The survey is essentially cross-sectional in that it describes and interprets what exists at present in the region.

3.1 Sampling procedure

In this process, we used multi-staged sampling method which combined both purposive and simple random sampling to select the final youth respondents for the study. Firstly, we purposely selected the two most rural local government areas (LGAs), each from the nine States of Niger Delta region. We also applied purposive sampling to select three rural communities from each of the selected LGAs, on the same basis that the communities are more rural than others. From the fifty four rural communities selected, we used simple random sampling with the help of community gate keepers to select 800 youths out of the selected rural communities, based on the population of the State in which the community is located (Table 1).

Table 1. Sample Size Determination Table

States	Total Population	Population of Youth	% of Total Population	Minimum Sample Per Community	Minimum Sample Per State
Abia	2,881,380	1,451,082	10%	13	80
Akwa Ibom	3,902,051	1,918,849	12%	16	96
Cross River	2,892,988	1,421,021	9%	12	72
Delta	4,112,445	2,043,136	13%	18	104
Imo	3,927,563	1,951,092	13%	17	104
Ondo	3,460,877	1,715,820	11%	15	88
Edo	3,233,366	1,599,420	10%	13	80
Bayelsa	1,704,515	830,432	6%	8	48
Rivers	5,198,716	2,525,690	16%	22	128
Total	**31,313,901**	**15,456,542**	**100**		**800**

Source: FGN, 2017/Authors' computation

3.2Data collection

To distinguish between the receivers of MOCs CSR via GMoU (CG) and the control group, youths were asked if they have received directly from the MOCs in the area of CSR to improve their livelihood in the area of farming. A structured questionnaire was administered to the

selected youths in a form that represents an appropriate tool to evaluate qualitative issues by quantitative information. Based on this questionnaire, scores were allocated according to the objectives of the study. The questionnaire was directly administered by the researchers with the help of research assistants. The local research assistants were used for the following three reasons. Firstly, the study area is multi-lingual with over 50 ethnic groups that speak different local languages and dialects. Secondly, the terrain is very rough with a high level of violence in some areas, and would require a local (an indigene) assistant. Finally, some items on the instrument would require further explanation, and best done by a native, in a local dialect.

3.3Analytical framework

The study analyzed the impact of Global Memorandum of Understanding (GMoU) of multi-national oil companies on sustainable capacity building of rural youths in Sub-Saharan Africa, using data generated from household survey carried out with structured questionnaire in the Niger Delta region of Nigeria. The study combined the use of propensity score matching (PSM) and logit model to estimate the impact of GMoU on creation of Job in the rural farms in order to reduce poverty and inequalities, enhance the well-being and capabilities of the rural youth population in Niger Delta. These methods were chosen on the basis that, the study needs to control for the problems of selectivity and endogeneity.

In Propensity Score Matching (PMS), we considered first the direct recipient of Corporate Social Responsibility through the General Memorandum of Understandings (CG) as a "treatment" so as to estimate an average treatment effect of CG using propensity score matching approach. Propensity score matching according Odozi*et.al*, (2010) involves predicting the probability of treatment on the basis of observed covariates for both the treatment and the control group. It summarizes the pre-treatment characteristics of each subject into a single index variable and is then used to match similar individuals. In propensity score matching, an ideal comparison group picked from a larger survey and then match to the treatment group based on set of observed characteristics on the predicted probability of treatment given observed characteristics ("propensity score") (Ravallion, 2001;Odozi *et.al*, 2010). This said observed characteristics are those used in selecting individuals but not affected by the treatment; hence in this study, using this methodology, we assume that the decision to be treated (that is, receiving CSR intervention), although not random, in the end depends on the variables observed. Rosenbaum and Rubin (1983), argued that the ability to match on variable X means that one can match on probability of X. Hence, estimating the impact of CG on

capacity building of the rural youths, two groups are identified. In this two group, those with CG (treated group) is denoted as R_i =1 for youths$_1$ and R_i = 0 otherwise (control group). The treated are now matched to the control group on the basis of the propensity score: (Probability of receiving CG given observed characteristics).

Hence: $P(X_1) = Prob(R_2 = 1/X_2)$ $(0<P(X_2) < 1)$ Equation 1

Where X_1 is a vector of pre CG control variables, if R_1's are independent over all 1 and the outcomes are independent of CG given X_1 then outcomes are also independent of CG given $P(X_1)$ just as they would do if CG are received d randomly. To draw precise conclusions about the impact of CG activities on capacity building of the rural youths, we saw the necessity to side-step the selection bias on observables by matching on the probability of the treatment (covariates *X)* to this; we defined the PS of Vector X thus:

$P(X) = Pr (Z = 1/X)$, Equation 2

The Z represents the treatment indicator equating 1 if the selected individual youth has received CG, and zero otherwise. Because the PS is a balancing score, the observables *X* will be distributed same for both treated and non-treated and the differences are seen as to the attribute of treatment. To get this unbiased impact estimates, we adapted the four steps from the literature (Rosenbaum and Rubin, 1983; Liebenehm, Affognon and Waibel, 2011). In the first place, we reorganized that the probability of receiving CG is predicted by a binary response model with appropriate observable characteristics. Hence, we pooled two individual group, (those who received CG (treated) and those who do not (Control). After these we estimated the logit model of CG receiving or not receiving as a function of some socio- economic characteristics variables. These variables include both individual, household and community variables represented in this equation as thus:

$P(x)=Pr(Z=1/X)=F(\alpha_1X_1.....+....\alpha_nX_n)=F(x\alpha)=e^{x\alpha}$ Equation 3

We created value of the probability of receiving CG from the logit regression assigning each youth a propensity score. The non- CG receiving youths with very low PS outside the range found for receiver were dropped at this point. For each household receiving CG a non-receiving that has the closest PS as measured by absolute difference in score referred to as nearest neighbour was obtained. We used the nearest five neigbours to make the estimate

more rigorous. The mean values of the outcome of indicators for the nearest five neigbours were calculated and the difference between the mean and actual value for CG receiving (treatment) is the estimate of the gain due to GMoU. This difference between treatment and control groups is estimated by the average treatment effect on the treated (ATT). The true ATT, based on PSM is written thus:

$ATT_{PSM} = E_{p(x)}\{E(y_1/Z = 1, P(x) - E(y_0/Z = 0, P(X)\}$, Equation 4

EP(X) stands for expectation with respect to the distribution of PS in the population. The true ATT indicates the mean difference in capability of the youths. In this we achieve an adequate match of a participant with his counterfactual in as much as their observable characteristics are identical.

Three different matching methods could be used in obtaining this matched pair. These methods which varies in terms of bias and efficiency are: nearest neighbor matching (NNM) radius matching (RM) and kernel-based matching (KM), a non-parametric matching estimator. The third thing we did was to check the matching estimators' quality by standardized differences in observables' means between receivers of CG and non-receivers. Representing difference in percent after matching with X for the covariate X, the difference in sample means for receivers as($\acute{X}_1$) and matched non-receivers as ($\acute{X}_0$). In line with Rosenbaum and Rubin, (1985), the sub-samples as a percentage of the square root of the average sample variances is put thus ($\int_1^2 and \int_0^2$.).

Hence:

$$|SD = 100 * \frac{(\acute{X}1 - \acute{X}0)}{\left(.05 \int_1^2 and \int_0^2 .)1/2\right)}$$ Equation 5

We accepted a remaining bias below 5% after matching even when there is no clear threshold of successful or failed matching. This we took as an indication that the balance among the different observable characteristics between the matched groups is sufficient. Generally, while considering the quasi-experimental design of the MOC's GMoU activity, there might be a possibility that unobservable factors like youths' intrinsic motivation and specific abilities or preferences, had affected the decision to receive or not. This problem of hidden bias was skirted by the bounding approach. In equation 3 above, we complemented the logit model to estimate propensity score by a vector U containing all unobservable variables and their effects on the probability of receiving CG and captured by γ:

$P(x)=Pr(Z=1/X)= F(X\alpha +U\gamma) = e^{X\alpha U\gamma}$ Equation 6

With sensitivity analysis, we examined the strength of the influence of γ on receiving CG in order to attenuate the impact of receiving CG on potential outcomes. Simply put, the assumption is that the unobservable variable is a binary variable taking values 1 or 0. To this, the receiving probability of both youths is applied in line with the bounds on the odds ratio as stated thus:

$$:\frac{1}{e\gamma} \leq \frac{P(Xm)(1-P(Xn))}{P(Xn)(1-P(Xm))} \leq e\gamma$$ Equation 7

Therefore, Rosenbaum (2002),could argue that both individual youth have the same probability of receiving CG, provided that they are identical in X, only if e 1

4. Results and discussion

4.1 Socio-economic characteristics analysis

The analysis of rural youths in the study begins with a description of some of their social (gender, location, household income), demographic (age, marital status, household size), and economic (occupation, household income, farm size) characteristics. These characteristics are important in understanding the differences in the socio-economic status of the farmers who are participating in the CG compared with their non-participating counterparts.

Table 2. Socio-economic characteristics of the respondents

Variables	Freq	%	Cum	Household Size	Freq	%	Cum
Primary Occupation				1-4 Person	338	42	42
Full Farming	489	61	61	5-9 Person	368	46	88
Trading	78	10	71	10-14 Person	72	9	97
Fishing	102	13	84	15 Person and above	22	3	100
Government/Private Paid Employment	48	6	90		**800**	**100**	
Handicraft	45	6	95	**Annual farm Income**			
Others	38	5	100	1000 - 50,000	162	20	20
	800	**100**		51,000 - 100,000	225	28	48
				101,000 - 150,000	160	20	68
Years of Experience in Farming				151,000 - 200,000	102	13	81
None	55	7	7	201,000 - 250,000	73	9	90
1 - 5 Years	251	31	38	251,000 - 300,000	56	7	97
6 - 10 Years	320	40	78	Above 300,000	22	3	100
11 - 15 Years	102	13	91		**800**	**100**	
Above 15 Years	72	9	100	**Annual Off farm Income Level**			
	800	**100**		None	309	39	39
Age of Respondents				1000 - 50,000	192	24	63
Less than 20 years	85	11	11	51,000 - 100,000	126	16	78
21-25 years	186	23	34	101,000 - 150,000	100	13	91
26-30 years	249	31	65	151,000 - 200,000	44	6	96
31 - 35 years	149	19	84	Above 200,000	29	4	100
35 - 40 years	86	11	94		**800**	**100**	
Above 40 years	45	6	100	**Participation in CG**			
	800	**100**		Yes	198	25	25
Level of Education				No	602	75	100
None	66	8	8		**800**	**100**	
FSLC	243	30	39	**Value of receipts Through CG**			
WAEC/WASSCE	383	48	87	None	346	43	43
Degree and above	108	14	100	1000 - 50,000	142	18	61
	800	**100**		51,000 - 100,000	102	13	74
Marital Status				101,000 - 150,000	75	9	83
Single	520	65	65	151,000 - 200,000	53	7	90
Married	210	26	91	201,000 - 250,000	34	4	94
Widow	23	3	94	251,000 - 300,000	29	4	98
Divorced/Separated	47	6	100	Above 300,000	19	2	100
	800	**100**			**800**	**100**	
Sex of Respondent							
Male	610	61	61				
Female	390	39	100				
Total	800	100					

Source: Authors' compilation based on household survey

Analysis (Table 2) indicates that about 61% of the respondent are full-time farmers, while 13% engage in fishing and only about 6% are employed by either government or private sectors in non –farm activities. The average age of the respondent is 29 years, while average experience is 9years, with about 9% having more than 15 years of experience. The analysis (Table 2) also shows that only about 8% of the rural youth population in the Niger Delta region is completely uneducated, while the rest are literate at least to basic education level. This finding contrasts with AGRA (2014), in that basic education is not the key challenge of rural youths in sub-Saharan Africa. About 65% of the respondents are single, while 26% are married, 3% are widowed, likely as a result of incessant violence in the region, and 6% are separated. Despite the abundant potentials of farming in the host community, the average annual farm income of the youth farmer is less than NGN50,000 (equivalent of 138 USD) per annum. While 25% of the youth has participated in any form of capacity building programme of the MOCs, 75% have not even heard much about it; hence, about 43% says they have never received any CG.

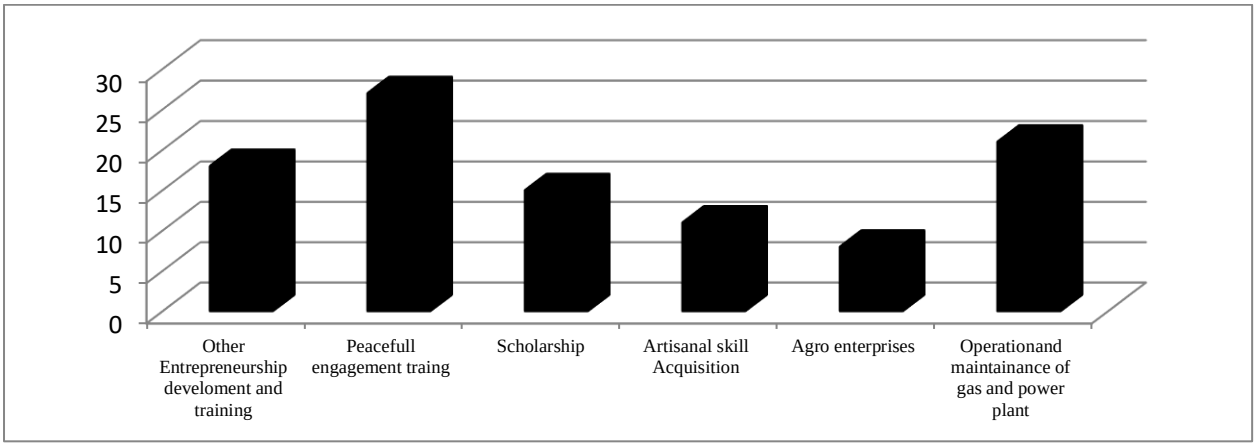

Figure 2. Percentage distribution of CGs intervention of MOCs by sectors in the Niger Delta.
Source: Authors' compilation based on household survey.

Analysis (Figure 2) reveals the catchment areas of MOCs capacity building using GMOU; 27% is in the area of peaceful engagement training, while 21% is in the area of operation and maintenance of gas and power plants; agro entrepreneurship development receives only 8%. This suggests that the CGs is mostly targeted areas that guarantee the exploration of the MOCs in a peaceful atmosphere, and the beneficiaries of such interventions are mainly urban based, while paying little attention to the majorities living in rural areas and working mainly in farms. This observation agreed with African Development Report (2015), in that income inequality in sub-Saharan Africa is mirrored in unequal access to resources and opportunities between rural and urban resident, and between women and men. This finding suggests that another group of

Africans that has widely remained widely excluded from economic progress is the rural young people. The findings concur with Uduji *et al* (2018b), in that the lack of gainful employment for young Africans is one of the most critical policy challenges of our time.

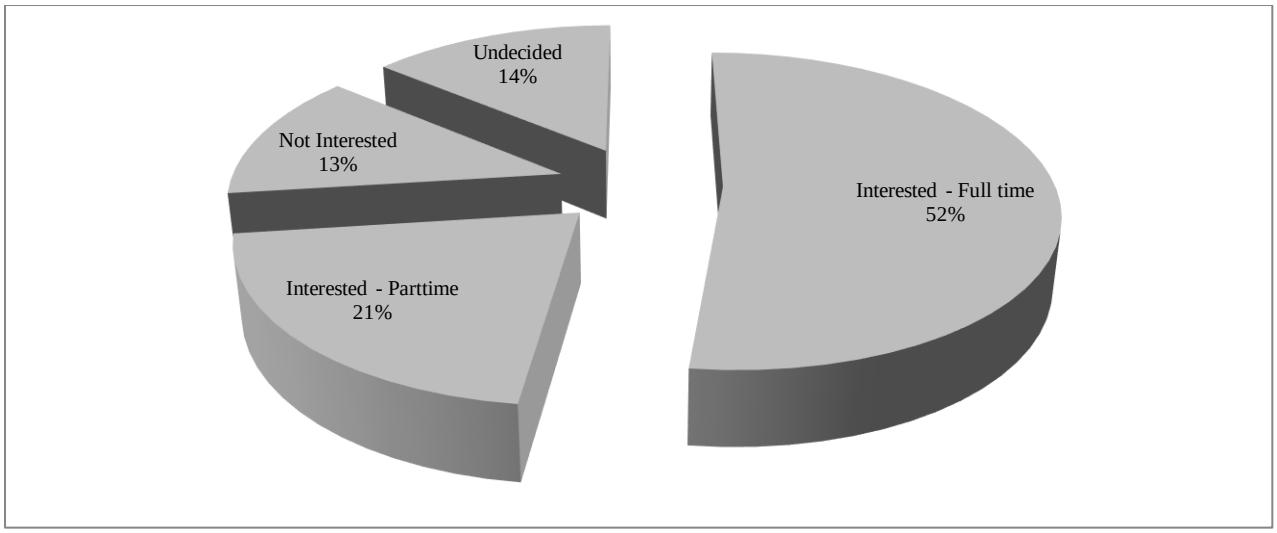

Figure 3. Willingness to participate in rural farming

Source: Authors' compilation based on household survey.

Analysis (Figure 3) shows that 52% of the rural youth are interested in full-time participation in farming, while 21% are interested part-time; only 13% are not interested, while the 14% are yet undecided. This finding suggests that any targeted GMoU intervention towards this direction will prove vital to increasing youth's involvement in the agricultural sector, and ultimately addressing the significant untapped potential of this sizable and growing demographic.

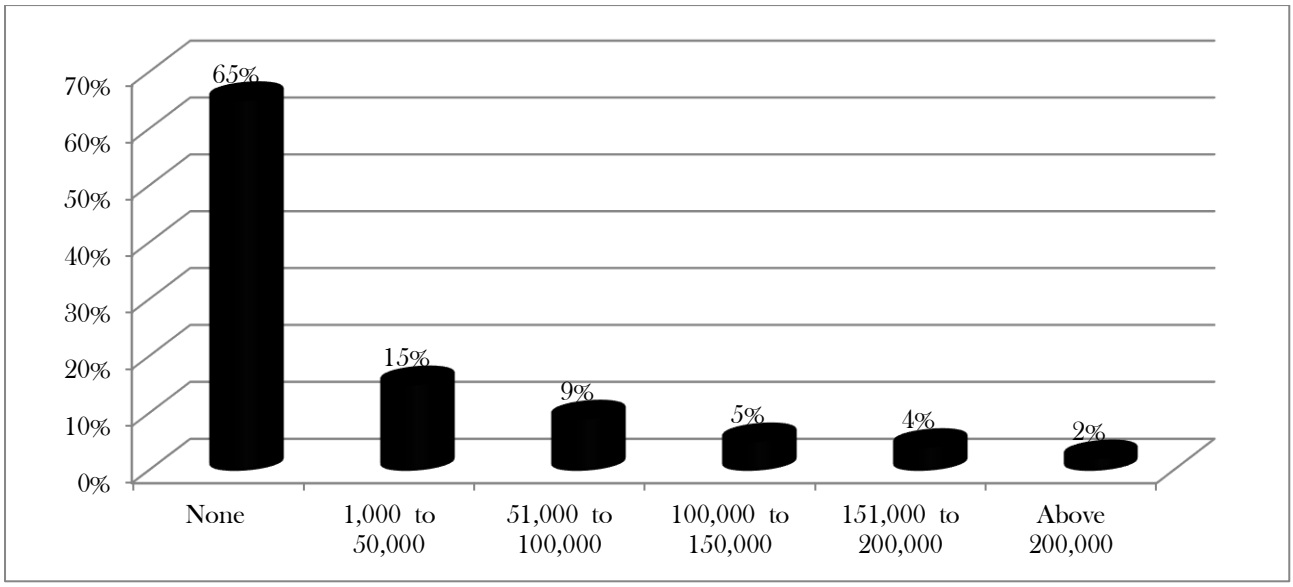

Figure 4. Rate of rural youths receipt of GMoU intervention on farm entrepreneurship.

Source: Authors' compilation based on household survey.

Analysis (Figure 4) indicates that 65% of the young farmers have not receive any intervention from GMoU on farm entrepreneurship, while 2% have receive N200,000 (equivalent of 548 USD) or more. This finding agreed with Uduji & Okolo-Obasi (2018a, 2018b), in that inadequate access to financial services is a principal challenge to young farmers in Nigeria; most financial service providers are reluctant to provide their services – including credit, savings and insurance – to rural youth due to their lack of collateral and financial literacy, among other reasons. This finding implies that promoting GMoUs financial interventions catered to youth, mentoring and training programmes can help remedy this issue.

Table 3. Distribution of the rural youth farmers according to their major challenge in the Niger Delta

Description	Receivers of CG					Non-Receivers of CG				
	None	1 - 30	31- 60	61-90	All	None	1-30	31-60	61-90	All
Access to Farm input		X							X	
Access to Lands				X					X	
Access to Farm credit		X								X
Poor Rural Transportation					X					X
Access to Storage facilities				X				X		
Poor Knowledge of input use and Application	X								X	
Short supply of Labour			X				X			
Usage of Manual Labour		X								X

Source: Authors' compilation based on household survey.

Analysis (Table 3) shows how the rural youth farmers have faced numerous challenges in farm enterprises; for the treated groups, only 1 -30% of the farmers are challenged with access to farm inputs like fertilizer, improved seeds and stems, crop protection products, as well as farm machineries. For the control group between 61 to 90%, struggle with getting inputs and on time. Access to land is a major challenge to both treated and control group, while about 60% and above have access to farm finance in the treated group and almost all the control group has not. Among the treated farmer, none has poor knowledge of input use and application, while over 60% of the treated have such challenges. This suggests that the little MOCs have done with the CG shows a sign of improvement in the rural youth farmer capability to function and improve their welfare. This suggests that agricultural capacity building must be adopted to ensure that young farmers' skill meet the needs of rural labour markets.

4.2 Econometric analysis

In analysis (Table 4), we summarized the average differences in the four basic scores and independent observable characteristics between participants and non-participants. Generally, the difference in means shows that the level of knowledge access to rural farmers in the sample is reasonably low with average test scores ranking from 15% to 31% of maximum score. Nevertheless, the farmers receiving CG reach significantly higher scores in all categories than those, who had not received. The difference is from 3% in the category of access to input to 11.5% in the category of Knowledge of input use and application. When the selected observable characteristics were examined, it shows that there are significant positive differences in means of farm size (8.15%), farm type (7.03%), farming experience (1.88%), annual income (7.66%), sources of farm input (1.31%) and primary occupation (1.62%). Furthermore, treatment youth recorded also negative significant mean in household size, marital status, and income of other household members which are 4.76, -4.28, and -1.89 respectively. On farm characteristics, treatment group have significantly more asses to input, better knowledge of usage, more access to farm credit and better enterprises management skills than the control group. Hence, observable participation incentives can be identified, which underlines the possibility that selective placement exists and therefore the need to apply propensity score matching.

Table 4. Comparison of mean knowledge score and observable characteristics across participants and non-participants (N = 800)

Access and Knowledge Score in Percentage of maximum score	Receivers	Non Receivers	Difference
Score on Access to Input	22.42	19.35	3.07**
Score on Knowledge of input use	31.08	19.56	11.52**
Score on Farm enterprise Management	19.73	14.68	5.05**
Score on Access to Farm Finance	21.32	16.78	4.54**
Socio-Economic Characteristics			
Age	22.23	20.45	1.78
Sex	12.56	13.47	-0.91
Education	31.83	20.21	11.62*
Marital Status	21.10	25.38	-4.28**
Household Size	11.32	16.08	-4.76
Primary Occupation	17.28	15.66	1.62*
Annual Income	42.52	34.86	7.66
Income of Other Household Members	6.36	8.25	-1.89
Farm Characteristics			
Farm Type	16.31	9.28	7.03**
Farm Size	27.80	19.65	8.15**
Source of Input	3.72	2.41	1.31*
Farming Experience	4.67	2.79	1.88***
Number of Transportation means	7.89	6.28	1.61
Observation	**198**	**602**	

Source: Authors' compilation based on household survey.

In line with the selected characteristics which capture the treated and control's relevant observable differences, the probability of receiving CG is predicted. The Logit model as built in equation 3 has the reported analysis (Table 5), the estimated coefficients; the odd ratio are expressed in terms of odds of *Z=1, the marginal effect and standard error.* Examining single observables, it is shown that primary occupation, educational level of the youth, farm size and perception of the GMoU are factors that positively influence the youth's participation in the capacity building programmes. On the other side, farming experience surprisingly affects it significantly in negative way.

Table 5. Logit model to predict the probability of receiving CG conditional on Selected observables

Variables	Coefficient	Odd Ratio	Marginal Effect	Std. Error
Age	.-037	.983	.009	.019
PriOcc	.319	.962	.120*	.142
Edu	.-007	1.017	.051**	.012
AY	.-016	.908	.00114	.042
Farm size	.017	.954	.0511**	.053
Exp	.-021	1.810	-.054**	.132
MS	.-013	1.930	.00135	.130
HHcom	-.319	.562	.0012	.205
Inpsou	.451	1.31	.0521	.013
Perception of GMOU	1.241	11.143	.061*	.052
Constant	1.816	5.131	.00261	.667
Observation	800			
Likelihood Ratio - LR test (ρ=0)	□□2 (1) □1135.23*			
Pseudo R^2	0.21			

*= significant at 1% level; ** = significant at 5% level; and * * * = significant at 10% level

Source: Authors' compilation based on household survey.

Following probability of receiving CG predicted in the model, the impact of the CG on youth farmers' access to input scores is estimated by the ATT in line with equation 4. After carefully certifying that observations are ordered randomly and that there are no large disparities in the distribution of propensity scores, the result (Table 6) shows that NNM (nearest neighbor matching) yields the highest and most significant treatment effect estimate in all four outcome categories of access to input, knowledge of input use, farm enterprise management and access to farm finance.

Table 6. Estimated impacts of CSR activities using the MOCs' GMoU (CG) on Youth farmers' capacity building using different matching algorithms

Description	Access and Knowledge Score in Percentage of Maximum Score		Average Treatment effect on the treated
	Receivers	Non- Receivers	
Nearest neighbor matching	Using single nearest or closest neighbor		
Score on Access to Input	34.21	30.52	3.69**
Score on Knowledge of input use	41.28	31.44	9.84**
Score on Farm enterprise Management	29.13	24.28	4.85**
Score on Access to Farm Finance	31.13	27.28	3.85**
Score on total capability of youths	27.21	21.34	5.87
Observations	**198**	**198**	
Radius matching	**Using all neighbors within a caliper of 0.01**		
Score on Access to Input	34.14	31.12	3.02**
Score on Knowledge of input use	40.16	32.34	7.82**
Score on Farm enterprise Management	28.41	25.13	3.28**
Score on Access to Farm Finance	30.43	26.22	4.21**
Score on total capability of youths	24.52	19.42	5.1
Observations	**181**	**281**	
Kernel-based matching	**Using a bi-weight kernel function and a smoothing parameter of 0.06**		
Score on Access to Input	34.14	32.02	2.12**
Score on Knowledge of input use	39.26	32.38	6.88**
Score on Farm enterprise Management	27.31	25.13	2.18**
Score on Access to Farm Finance	28.33	26.22	2.11**
Score on total capability of youths	21.67	12.36	9.31*
Observations	**195**	**599**	

*= significant at 1% level; ** = significant at 5% level; and * * * = significant at 10% level

Source: Authors' compilation based on household survey.

The nearest neighbor estimate of the access to modern farm input due to receiving CG is approximately 6%. But, in as much as NNM method yields relatively poor matches as a result of the limitation of information, we shifted attention on the other two matching method (KM and RM). The estimated impact using radius matching algorithm is about 5.1%, while Kernel-based matching algorithm produces a significant average treatment effect on the treated of

9.31%, which is the highest impact estimate for total capability of youths. Consequently, it can be confirmed that CG generate significant gains in youth farmers' capacity building, and if encouraged and improved upon will lift many out of poverty line.

Following the model in equation 5, we attempt checking the imbalance of single observable characteristics as the third step and it shows that the quality of KM and RM in matching is much higher than that of the simple method of choosing the only closest neighbor with respect to the propensity score. The summary (Table 7) statistics for the overall balance of all covariates between treatment group and control confirms the higher quality of kernel-based matching and radius matching. Both the mean and the median of the absolute standardized difference after matching are below the threshold of 5%.

Table 7. Imbalance test results of observable covariates for three different matching algorithms using standardized difference in percent

Covariates X	Standardized differences in % after		
	Nearest neighbor matching	Radius matching	Kernel-based matching
Age	15.7	3.3	2.1
PriOcc	11.6	5.3	3.4
Edu	31.4	6.4	8.8
AY	9.5	3.8	2.1
Farm size	12.6	2.7	0.5
Exp	31.4	2.4	4.3
MS	21.5	4.9	2.6
HHcom	19.4	5.4	2.1
Inpsou	22.5	4.1	1.9
Perception of GMOU	86.4	5.5	6.3
Constant	41.6	2.8	4.7
Mean absolute standardized difference	27.60	4.24	3.53
Median absolute standardized difference	19.4	4.1	3.4

Source: Authors' compilation based on household survey.

In the final stage, and in line with equation 7 in the model, we examined (Table 8) the sensitivity of significance levels knowing that it is the responsibility of an appropriate control strategy for hidden bias, and compares the sensitivity of treatment effects on scores on access to input, knowledge of input use, farm enterprise management access to farm finance, and score on total capability of youths among the three introduced matching algorithms. In all, robustness results produced by Rosenbaum's bounds are quite similar.

Table 8. Sensitivity analysis with ROSENBAUM'S bounds on probability values

	Upper bounds on the significance level for different values of e^{γ}				
	e^{γ}= 1	e^{γ}= 1.25	e^{γ}= 1.5	e^{γ}= 1.75	e^{γ}= 2
Nearest neighbor matching	Using single nearest or closest neighbor				
Score on Access to Input	0.0001	0.0041	0.0634	0.418	0.871
Score on Knowledge of input use	0.0001	0.0012	0.0321	0.231	0.621
Score on Farm enterprise Management	0.0001	0.0016	0.0021	0.321	0.211
Score on Access to Farm Finance	0.0001	0.0021	0.0031	0.0521	0.143
	0.0001	0.0223	0.0231	0.0241	0.0411
Radius matching	Using all neighbors within a caliper of 0.01				
Score on Access to Input	0.0004	0.0214	0.1634	0.628	0.091
Score on Knowledge of input use	0.0001	0.0013	0.0021	0.134	0.066
Score on Farm enterprise Management	0.0002	0.0012	0.0032	0.021	0.0731
Score on Access to Farm Finance	0.0001	0.0002	0.0009	0.0081	0.0436
Score on total capability of youths	0.0001	0.0015	0.002	0.0312	0.0732
Kernel-based matching	Using a bi-weight kernel function and a smoothing parameter of 0.06				
Score on Access to Input	0.0001	0.0184	0.164	0.485	0.034
Score on Knowledge of input use	0.0001	0.0071	0.0231	0.213	0.012
Score on Farm enterprise Management	0.0001	0.0011	0.0001	0.005	0.0218
Score on Access to Farm Finance	0.0001	0.0015	0.0013	0.0021	0.0134
Score on total capability of youths	0.0001	0.0315	0.012	0.0421	0.0432

Source: Authors' compilation based on household survey.

Analysis (Table 8) shows that KM generated more robust treatment effect that NNM and RM in respect to estimates to hidden bias, especially for access to input, knowledge of input use, as well as for total capability of youths. There is a probability that matched pairs may differ by up to 100% in unobservable characteristics; while the impact of CG on access to input, knowledge of input use as well as for total capability of youths, would still be significant at a level of 5% (p-value = 0.034 and p-value = 0.012, and p-value = 0.0432 respectively). The same categories of knowledge score are robust to hidden bias up to an influence of e^{γ}=2 at a significance level of 10% following the radius matching approach.

On the whole, our findings demonstrate that increased youths' involvement in the agricultural sector is more important than ever; as rising African population and decreasing agricultural

productivity gains mean that youths must play a pivotal role in ensuring a food-secure future for the continent. Most critically, our findings suggest that the relative priorities of CSR of MOCs in Africa should be different from the classic Western version of Carroll (1991). This takes side with Visser (2006), Amaeshi *et al* (2006), Uduji *et al* (2019b, 2019c) in calling for flexibility approaches to CSR policy and practice by multinationals operating in Africa. However, in extension and contribution, we submit that farming offers the young generation a chance to make a difference by growing enough food to feed the sub-Saharan Africa; the youths who become farmers today have the opportunity to be the generation that would end the region's hunger and alleviate malnutrition, as well as helping the sector adopt to climate change. Hence, if the MOCs are to work towards an ideal CSR approach, we would argue that engaging youths in agriculture should be assigned the highest CSR priority in sub-Saharan Africa. Therefore, it is our contention in this paper, that MOCs hold the key to sustainable agricultural development in the region. While the challenges of re-engaging youths in agriculture can be complex and interwoven, a number of key suggestions emerged for GMoUs, RDCs and clusters: ensuring that rural youths acquire the modern farming information and communication technologies; involving the young people in integrated training approaches so that youths may respond to the needs of more modern agricultural sector; organizing and bringing youths together to improve their capacities for collective actions; and providing youths-specific projects and programmes for extra push needed to enter agricultural sector.

5. Concluding remarks, caveats and future research direction

The agricultural sector is seen as crucial to addressing the disproportionately high levels of youth's unemployment, underemployment and poverty. Yet, in the Niger Delta, Nigeria, few young people see a future for themselves in agriculture or rural areas. They migrate to cities in search for employment in oil companies, leaving the farms for the aged parents. Thus, we set out to assess the impact of a new CSR model of multinational oil companies on equipping the rural young people with essential farming skills and knowledge for adoption and application of modern agricultural inputs (improved seeds, fertilizers, crop protection chemicals, machinery, irrigation and other farming technical knowledge) to sustain the traditional source of livelihood of the people of Niger Delta, Nigeria. Eight hundred rural young people were sampled across the nine States of the Niger Delta region. Results from the use of propensity score matching and logit model showed that GMoU model has recorded significant success in the areas of economic empowerment, capacity building and improving lives generally, but has also widely excluded rural young people from the targeted agricultural clusters. This implies undermining a

younger generation that can help introduce new technologies whilst also learning from traditional methods and holding the potential to offer the perfect fusion of new and traditional solutions to some of the sub-Saharan Africa's biggest challenges. These findings suggest that if the MOCs are to work towards an ideal CSR approach, re-engaging youths in agriculture should be assigned the highest CSR priority in the region. It is our contention that MOCs hold the key to sustainable agricultural development in sub-Saharan Africa by providing the youths-specific projects and programmes for extra push needed to enter agricultural sector. Also, a coherent and integrated response is needed from policy makers and development practitioners alike to ensure that the core challenges faced by youths are effectively addressed.

This research provides multinational oil companies, development practitioners, including youth leaders, youth associations, and producers' organizations with insights into plausible solutions to overcome core challenges to increasing youths' involvement in the agricultural sector, and ultimately addressing the significant untapped potential of this sizeable and growing demographic, especially in rural sub-Saharan Africa. The main caveat of the study is that it is limited to the scope of rural areas in sub-Saharan Africa. Hence, the findings cannot be generalized to other developing regions of the world with the same policy challenges. In the light of this shortcoming, replicating the analysis in other developing regions is worthwhile in order to examine whether the established nexus withstand empirical scrutiny in different rural contexts of developing countries of the world.

Disclosure statement

No potential conflict of interest was reported by the authors.

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