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CULTURE, MEDIA & FILM | RESEARCH ARTICLE

Agriculture and social protection for poverty reduction in ECOWAS

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Abstract: The first goal of the sustainable development goals is to terminate poverty by 2030, and the West African countries are working assiduously to achieve this goal. Poverty remains a global challenge that is yet to be completely overcome. However, since 1990, the rate of poverty has been reduced by more than half globally. That is, the number of individuals living in poverty reduced from 1.9 billion people in 1990 to 836 million in 2015. However, the poverty rate is still high in the Economic Community of West African States (ECOWAS), as it represents about 40% of the worldwide poverty rate. This study examined the feasibility of poverty reduction programmes through a well-coordinated social protection policy on agriculture. The data for this study were obtained from international organizations (WDI, ILO, CPIA and UNESCO) covering a period between 2007 and 2017. The study engaged the Generalised Method of Moments technique on the selected variables. The results showed that a positive relationship exists between agriculture value

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PUBLIC INTEREST STATEMENT

Before other natural resources were discovered, agriculture was believed to be the backbone of the West African economies. But unfortunately, the sector has been neglected by most of these West African countries, which have brought a reduction in the employment generated by the agricultural sector. This necessitated the need to carry out this study, which examined how the agricultural sector can help generate employment in order to reduce the poverty level in ECOWAS sub-region. The study made a case for the provision of social protection to farmers so that the citizens would be encouraged to practice agriculture. The study strongly believes that when the citizens are given the necessary encouragement, more people will be willing to involve in agricultural activities, hence the high poverty level will reduce.

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added, employment, inequality and poverty while social protection and literacy level showed a negative relationship with poverty reduction. The study recommended that the governments of the ECOWAS member nations should enforce necessary forums to enlighten farmers on the importance of practising mechanised farming and the need for social protection.

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Subjects: Q1; Q55; Q0

1. Introduction

The first sustainable development goal (SDG) is to eradicate poverty by 2030; poverty is dreaded in any country, so every country of the world seeks to eliminate it. It is in the light of this that this paper seeks to examine how poverty can be reduced in the Economic Community of West African States (ECOWAS) sub-region via the provision of social protection to farmers in order to achieve sustainable development. The menace of poverty and hunger in the ECOWAS countries brought about the adoption of the social protection policy. The word social protection refers to the policy or action and framework directed at reducing weakness and shocks through alleviation of poverty perils by promoting effective labour markets, minimizing individual's vulnerability to risks and building their capabilities to coordinate economic and social disturbances, including old age and ill health, disability, unemployment and financial exclusion (Devereux, 2016; Osabohien, 2017). Economic theory has pointed out that social protection policy is a set of public or government transfer which is in form of income re-distribution from the rich to the poor to bridge the gap of inequality (Matthew, Osabohien, Fagbeminiyi, & Fasina, 2018; Tirivayi, Knowles, & Davis, 2016).

Devereux (2016) views social protection as a formal and informal venture that socially assists poor families and persons. In FAO (2015) Report, the concept of social protection indicates a conceptual plan of giving in-kind or cash aid to lesser opportune individuals, accompanied with the capability of safeguarding the susceptible from shocks and risky uncertainties. Similarly, Dorward, Wheeler, MacAuslan, Buckley, and Etals (2006) described social protection as a policy that involves quantification of collective activities adopted to enhance anxiety control of individuals, households and rural farmers. Exporting agricultural products is the major source of ECOWAS external trade, with generation of about six billion dollars (6bUSD), or regional exports of roughly around 16.3% of tangible and intangible merchandise (World Bank, 2015).

Poverty and hunger are the two main problems faced by African countries. This is because the number of persons living in hunger and poverty keeps increasing (FAO, 2017; Hammer, Healey, & Naschold, 2000; Matthew, Fasina, Olowe, & Adegboye, 2010). It posits that globally, the number of individuals suffering from hunger rose from 459 million in 2007 to 2008 to 815 million individuals due to the high incidence of poverty in 2016; this is indeed the first increment in hunger levels after the 2007–2008 food price crises (Clunies-Ross, Forsyth & Huq, 2009; Osabohien, Osabuohien, & Urhie, 2018). Similarly, there is a sizeable rise from 777 million individuals plagued with under-nourishment in 2015 to 784 million people in 2016, and this showed that the rate of poverty is still relatively high globally, considering the fact that the bulk of poor persons are from the less developed countries (World Bank, 2017; Osabohien, Matthew, Aderounmu, & Olawande, 2019). According to FAO (2017) report, this increment arises as a result of disputes and impacts of climatic changes in some areas of sub-Saharan Africa (SSA), West Asia and South-east.

The agricultural sector occupies an essential position in the West African sub-region, and this sector is recognisably the heartbeat of the region's economy (Osabohien, Osabuohien et al., 2018). Such recognition emanates because its impact cuts across societies at various stages, given that

the regional economies and labour force, incomes and access to food rely mainly on the sector such that the ECOWAS agricultural sector generates over 35% of gross domestic product (GDP) (Food and Agriculture Organisation—FAO, 2017). However, agriculture has mostly been unappealing to the populace, especially youths, for a variety of factors which include low investment input and time returns, land accessibility, poor investments in essential infrastructure for effective value chains, inadequate social protection and the use of crude implements (Amoo, 2017; Collinson, White, Ginsburg, Gomez-Olive, Kahn & Tollman, 2016). These drawbacks have made youths to rather remain unemployed especially in the rural areas than to engage in agricultural activities which yield low return due to weak institutional framework in delivery resources efficiently for optimal use (Ejemeyovwi, Osabuohien, & Osabohien, 2018; Gershon, Ezenwa, & Osabohien, 2019; Matthew et al., 2019). Thus, it is important to direct social protection policies and programmes to the agricultural sector to make that sector more lucrative and conducive to practice in order to make it a profitable venture that forms the motivation for this study.

The export potentials of the agricultural commodities produce a considerable revenue amount that the government uses to pay for importing final commodities and machineries relating to intermediate and capital products for services and industrial usage. In terms of employment opportunities, ECOWAS's agricultural sector is still the biggest labour supplier, which engages over 60% of her active populace, notwithstanding that sectoral earnings are below other economic sectors (Afolayan, Okodua, Matthew, & Osabohien, 2019; FAO, 2015; Gichuhi & Nasiyo, 2016). Moreover, agriculture is an important contributor to the alleviation of poverty at every phase so as to attain food security by 2030 (World Bank, 2017; Food and Agriculture Organisation—FAO, 2017; Matthew et al., 2018). Usually, West African families that practice farming utilise cutlasses and hoes, which is capable of only producing agricultural yield for personal consumption, whereas those living in urban areas (which account for over 50% of regional total populace) obtain nearly all their food from the rural markets (Food and Agricultural Organisation—FAO, 2015; International Monetary Fund, & World Bank, 2015; Matthew et al., 2018).

Presently, about 80% of ECOWAS population's food requirements are met by regional output, although over a few subsequent years, West African agriculture will need to satisfy large demand increment that spans from demographic expansion. ECOWAS population is currently 290 million, with estimations to exceed 400 million by 2020, and 500 million by 2030 (ECOWAP, 2008). Regardless of progressions in minimising dominance of extreme poverty (population share surviving on below $1.25 daily), in middle- and low-income nations, small advancement has been recorded in lessening the magnitude of people living between $1.25 and $2.00 daily in ECOWAS (Food and Agriculture Organisation—FAO, 2017). This is particularly necessary because, this number is very low when compared with the developed countries where the per capita income is high (Food and Agriculture Organisation—FAO, 2017). Narrowing down the number of persons living on within $1.25 and $2.00 daily will help improve on aggregate welfare of the people in West Africa. The world's population as at 2017 was estimated to be over 5 billion people, out of which about 2 billion (about 40% of the world's population) are considered poor, and this implies that poverty still persists, especially among developing countries (International Monetary Fund & International Monetary Fund, & World Bank, 2015). It is believed that poverty has a higher prevalence in rural communities than cities of developing countries, including the West African sub-region (IFAD, 2010; Ravaillon, Chen, & Sangruala, 2007).

SDG1 has four targets which are, first, to eliminate absolute poverty everywhere among all the people by 2030. This is measured by the number of individuals who live below $1.25 per day; second, at least, by 2030, the number of individuals living in absolute poverty. Third, ensuring that everyone particularly, the less privileged and the most vulnerable, have even access to resources (economic, basic services, land tenure system amongst others) by 2030, and fourth to make the most vulnerable and the less privileged more resilient and minimise their exposure to risk and vulnerability to shocks and by 2030 (Food and Agriculture Organisation—FAO, 2017; Matthew, Adeniji, Osabohien, Olawande, & Atolagbe, 2019; Osabohien, 2017; Osabohien, Matthew, Gershon, Ogunbiyi, & Nwosu, 2019). However, this study focuses on the first target which is the elimination of poverty by increasing

efficiencies of the agricultural sector for employment creation through well-cordinated social protection programmes and policies (Osabohien, Afolabi, & Godwin, 2018). Thus, the necessity to direct social protection policies and programmes to the agricultural sector for higher lucrative and conducive practice in order to make it a profitable venture forms the motivation for this study.

2. Social protecton policies and agricultural output

Social protection is a set of policies that is targeted towards reducing poverty and endangerment by minimising individual's susceptibility to unforeseen phenomena and risk (Country Policy Institutions Arrangement—CPIA, 2017). The widely recognised place of social protection is how it helps individuals to manage risk and reduce their exposure to shocks (Devereux, 2016). Social protection constitutes part of the government's most direct reactions to addressing the problem of poverty. Some of these responses include subsidizing the price of fertilizers sold to farmers and leasing of land to farmers at lower rates amongst others, which helps in boosting the incomes of the farmers (Devereux, 2016; Osabohien, Matthew, Gershon, et al., 2019).

Social protection programmes, when properly earmarked and structured, facilitate or bridge consumption and income shortcomings of poor families and protection of health (Matthew et al., 2018; Osabohien, 2017). Consistent and foreseeable provisions will likewise productively impact households via supplying some levels of liquidity and insurance for them to optimise economic opportunities. In addition, advantages of social protection might include multiplier impact on locally situated societies (Devereux, 2016; Food and Agricultural Organisation—FAO, 2015; International Monetary Fund, & World Bank, 2015). Based on the aforementioned background, this study's objectives include (i) to investigate the nexus between agriculture, employment generation and social protection in the ECOWAS countries and (ii) to explore how this link can help attain the reduction of poverty which is part of SDG1 by 2030.

Social protection schemes have evolved in the last 30 years and been advantageous to numerous persons. Yu, Fan and Magalhães (2015) carried out a study on the substantial rise of government expenditure per capita from 1980 to 2010 by analysing an unbalanced panel dataset for 147 countries. Findings from Yu et al. (2015) showed that the growth is connected to higher spending per capita on social protection, health and education, with swift increment among developed and developing countries. Top exhaustive approximation from administrative data and household survey data is that 1.9 billion individuals in developing countries received social support (International Monetary Fund, & World Bank, 2015).

Social protection is important for a minimum standard of social safety and wellness for persons dwelling in both rural and urban areas (Osabohien, 2017). A well-structured social protection minimises the risk of investment in agriculture and benefits agricultural growth more directly and promotes social inclusion, thereby reducing the incidence of poverty (Devereux, 2016; Van-Ginneken, 2016). This assures safety net for farmers in terms of support for the unexpected shocks and encourages investment and innovation as well as providing a favourable environment for agricultural business. In fact, social protection incorporates investing for subsequent growth, as it helps households to pull out of poverty cycles through health and educational investment for their children (Devereux, 2016). Actually, careful choice of policy and proper strategies to be implemented at a certain time ensures social protection is complementary to growth (Ravaillon et al., 2007). For instance, implementation of the voucher subsidy input in Tanzania for the period of 2009 to 2013 allowed poor farmers to acquire inputs that were not initially affordable (Devereux, 2016). But on the other side, it distorted input market and prices; consequently, there was an increase in dependency for the farmer to the free inputs and reduces a deliberate effort to agricultural investment. Osabohien, Afolabi, et al. (2018) argued that interventions which choose agriculture as a safety net might not succeed like those who strategize to exploit agriculture for enhanced development.

Callistus and Mulugeta (2014) investigated the effects of social grants on poverty reduction for Ghanaian families by using in-depth interviews, focus group discussions and structured

questionnaires. The research discovered that via being empowered over poverty by sustained means of living, social grants have positively impacted school enrolment rates for children within 6–13 years, frequent usage of health-care amenities and food consumption across recipient homes. The authors suggested that the government should raise cash, frequently make transfer payment and connect beneficiaries to current augmenting services in the area, employ more workers and administer in-service training forums for recipients.

This implies that the provision of social grant encourages more people to be involved in agriculture, thereby increasing the rate of employment in the sector, which will enhance agricultural output, and this would help give the farmers social protection. In line with Callistus and Mulugeta (2014), Omorogiuwa, Zivkovic, and Ademoh's (2014) studies were carried out to empirically examine agriculture's functionality in economically developing Nigeria. Trend analysis for existent and historical outlook of agricultural operations and several descriptive techniques was used to analyse agricultural advancement and its usefulness to Nigeria. It was proven that thorough research into agricultural progressions is critical to national development. Additionally, less significant emphasis was made in proposing solutions to achieving economic development via agricultural mechanisms.

Ogbalubi (2013) carried out an empirical investigation observing that agriculture possesses considerable possibilities for transforming Africa's economy. It was moreover affirmed that very crucial West African policies are channelled towards supplying agricultural raw input and food security required by manufacturing industries for providing sufficient income and jobs. Recommendations of credit provision to farmers, prioritising agriculture, stabilising prices and extending services were proffered. Similarly, Gustavo and Kostas (2007) investigated the relationship between rurality and poverty and their functions in reducing poverty and developing rural places. The researchers contended that historically misconstruing the primary sector acted as grounds for anti-agricultural partiality in public policy till the late 1980s.

Historical misconception entails using primitive tools for rural farming activities, as farmers are resistant to mentally discarding such practices (Gustavo & Kostas, 2007). Their conclusion that developing economies still certainly requires agriculture to commence rural development in contrast to developed nations is contentious. Similarly, Matthew and Adegboye (2010) examined agriculture's role in developing the economy of Nigeria between 1970 and 2008. Johansen co-integration method was employed to analyse data. Research outcomes portrayed that the agricultural sector did not significantly affect Nigeria's economic development. Hence, their proposition that technology and research would propel agricultural development and boost sectoral productive levels, in addition to setting up agricultural finances by the government to fund and foster large-scale and medium-scale production for greater exports, domestic consumption and employment.

Eliamoni, Fenggying, and Cheng (2015) examined how agriculture facilitates reduced poverty and economic growth in Tanzania through descriptive analysis from 1980 to 2014. These authors found that insufficient public facilities coupled with a higher population of families in rural locations worsened poverty circumstances and quickened transition from agriculture to non-agricultural tasks, particularly by learned youths. Thus, suggestions were made for an increased number of persons to be urged to farm in local regions as well as soft loan provision to farmers, given that the concerned economy aims to continually pursue superior accomplishments in providing arable farmlands. Also, the favourable climate would definitely aid greater production of foodstuff, which will ensure available supplies of agricultural output. Likewise, Ajibade, Ajayi, and Allo (2016) believed that participating in present global businesses warrants undertaking SWOT analysis (strengths, weaknesses, opportunities and threats), for sustainable investment.

3. Agricultural productivity and poverty reduction

Ogundipe, Ogunniyi, Oduntan, and Olagunju (2016) examined the impacts of agricultural productivity on downscaling poverty in Africa by employing System-GMM method (in solving endogeneity

issues of variables) and dynamic panel data technique (to cater for cross-sectional and time-series data) from 1991 to 2015. Empirical findings indicated that agricultural value added per worker contributed substantially to lessening Africa's poverty. Development schemes aimed at boosting agricultural productivity and comprising credit-accessibility strategies were suggested such that rural farmers would have a higher asset base for massive commercial production. Also, thoroughly reliable and stable institutional frameworks and suitable macroeconomic policies must be enforced to enhance the delivery of accredit access, equitable lands and social services.

Bart and Barrett (2008) examined agricultural technology, productivity and poverty reduction in Madagascar. Spatially explicit dataset was adopted to connect Madagascar's agricultural advancement and rural poverty. Agricultural production was found to make up vital tactics of lessening high levels of food insecurity and poverty that dominated rural Madagascar. Moreover, previous researches have shown that African youths have a preference for "white-collar" jobs than getting involved in agriculture. This claim was supported by Collinson et al. (2016) using a descriptive approach to analyse youth migration, livelihood prospects and demographic dividend in South Africa's rural northeast. It was ascertained that just 10% of male youths had agricultural-related jobs in 2000, which further dropped in 2012 to 3%. Identically, 11% of female youths were recruited in the agricultural sector as at 2000 before falling to 6% in 2012. Notably, the rest of the populace in that timeframe had jobs in other economic sectors. Hence, the recommendation that higher employment in agriculture would require more youths to be induced in participating in well-coordinated social protection programmes, which will invariably reduce the rate of unemployment and poverty. According to Mendy (2016), poverty sources within ECOWAS span across low GDP per capita, high unemployment, distributional inequalities, poor governance and economic diversification, and so on. These conditions cause greater heights of social evils of drug trafficking, kidnapping, prostitution and armed robbery.

Among the theories reviewed, this study adopts the cyclical and interdependency theory of poverty as used by Egye and Muhammad (2015). This is due to the fact that the theory sees people and their communities as caught in a spiral of opportunity and difficulties; therefore, people and societal possessions are multi-dependent (Egye & Muhammad, 2015). Reasonable steps have been taken by member countries of the United Nations towards the attainment of Vision 2030 tagged "Sustainable Development Goals" (SDGs), whose vision has 17 goals and 169 targets; however, this study focused on Goal 1 which is the elimination of poverty. It was motivated that agriculture is still an essential medium to see this goal achieved, specifically in West Africa that account for over 40% of global poverty, and poverty is more prevalent across rural household farmers (Food and Agriculture Organisation—FAO, 2017). This paper concentrates on ECOWAS region, comprising 15 countries, viz., nine French-speaking (Togo, Senegal, Niger, Mali, Guinea Bissau, Guinea, Ivory Coast, Burkina Faso and Benin); five English-speaking (Sierra Leone, Nigeria, Liberia, Gambia and Ghana), and Portuguese-speaking Cape Verde. Secondary data are utilised and obtained from World Development Indicators (WDI, 2017), United Nations Education, Scientific and Cultural Organisation Gini index (2017), Country Policy and Institutional Assessment (CPIA, 2017) and International Labour Organisation (ILO, 2017).

Despite the fact that the poverty incidence in Nigeria showed that over 70% of the populace survives with a poverty level of lower than 1.25 US$ dollar, and this low poverty rate in Nigeria represents a relative comparison with the other countries. However, SDG1 (which has as one of its goals to eliminate poverty in all its forms) may be attained by the year 2030, as its rates fell from approximately 30% in 1990 to 12% in 2015; in terms of figures, the extreme rate of poverty might not be eliminated, since it reduced from 1.27 billion in 1990 to 0.75 billion in 2015; the greatest reduction occurred among countries in East Asia and South Asia, Europe and Americas; but, ECOWAS poses a different picture as the rate of poverty keeps increasing and is projected to be more by the year 2030 (FAO, 2017). Projections have it that in ECOWAS, and other SSA nations, SDG1 goal may not be attained; a slight improvement will only be attained if policies such as social protection policies are changed in no distant time to reduce vulnerability (Adeleye, Osabuohien, Bowale, Matthew, & Oduntan, 2017; Amoo, 2018; Osabohien & Bamigbola, 2017).

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It is a known fact that unequal distribution of income makes the poor not to be linked to the growth process (Tersoo, 2013). According to literature, nations with a high rate of inequality require twice as more growth as nations that have low inequality rate in order to attain the poverty target (Hammer et al., 2000). Weak social protection has also weakened the reduction of poverty in ECOWAS as the highest rate of poverty arises among rural dwellers who rely on agriculture to survive (Tersoo, 2013). Social protection programmes have been proven to be among the most effective weapons for fighting poverty and unproductive capacity of rural households that depend on agriculture (Osabohien, 2017). Given SDG1 and its target by 2030, the current state of poverty is that approximately 836 million individuals are living in absolute poverty and are predominantly found in developing countries of the world, at least one in five people lives below the poverty line (Food and Agriculture Organisation—FAO, 2017). The largest number of individuals living beneath the poverty line come from two major regions of SSA and Southern Asia.

4. Data source and method
The description of variables used for this analysis is displayed in Table 1.

Econometric and descriptive methods are employed in this study. The descriptive method engaged figures (Figures 1 and 2), and Generalized Method of Moments (GMM) was adopted due to possibilities of

Table 1. Variable definition and source of data			
Variable name	**Identifier**	**Source of data**	**Definition and measurement**
Poverty	POV	ICRG	Poverty headcount at 125 purchasing power
Agriculture valued added	AVA	WDI, 2017	Agriculture value added, measured as % of GDP, represents net output of agricultural after deducting intermediate inputs (consisting of crop production, hunting, fishing and forestry)
Social protection	SOP	CPIA, 2017	Social protection comprises policies targeted at ameliorating poverty and vulnerabilities by minimising individuals' susceptibility to risks. It was captured by social protection ratings (1 = low to 6 = high)
Employment in agriculture	EMPA	WDI	Labour force in agriculture is the aggregate number of male and female persons who are involved in agriculture and it is measured as % of total employment (Dahiya, 2012)
Inequality	INQ	ICRG	Gini coefficient
Literacy rate	LR	WDI	Literacy rate in this study measures Literacy rate, adult total (% of people ages 15 and above)

Source: Authors' compilation, 2019. **Note**: CPIA: Country Policy and Institutional Assessment; WDI: World Development Indicators. ICRG means International Country Risk Guide. Social protection rating is a standard measurement of rating from 1 to 6; 1, when a country has fragile social protection and 6 for strong protection (Osabohien, Osabuohien, et al. 2018).

omitted variable bias and endogeneity. Variables relating to agriculture, employment and social protection might be endogenous and typically have constrained time disparity. Statistics have shown that the United Nations' quest for development has been a great achievement as the number of persons dwelling in poverty has fallen from 1.9 billion in 1990 to 836 million in 2015, though this achievement is limited to ECOWAS region (Food and Agriculture Organisation—FAO, 2017). The variables showed that within 10 years, that is, the period under study (from 2007 to 2017), poverty rate in ECOWAS accounted for over 40% of global poverty rate (Food and Agriculture Organisation—FAO, 2017). This is as shown in Figure 1.

Figure 1 presents the average poverty rates across ECOWAS countries between 2007 and 2017. It could be seen that in this region, the rate of poverty seems to be higher in Sierra Leone with poverty rate of 60.58%, Togo with poverty rate of 59.25%, Guinea Bissau with poverty rate of 57.09%, Gambia with poverty rate of 55.59%, Guinea with poverty rate of 54.01%, while Nigeria has a relatively low poverty rate of 13.52% when compared to other countries of the region.

Figure 2 presents the state of social protection across ECOWAS countries. It can be seen from Figure 1 that the poverty rate is high in ECOWAS as a result of weak social protection across the region. It could be also seen that countries' rate of social protection is either partial or weak: Benin, Guinea, Senegal, Togo, Guinea, Niger, Burkina Faso with ratings of 3, while Nigeria, Cape Verde and Ghana are approximately 4. None of the ECOWAS countries attain strong level of social protection (Osabohien & Osuagwu, 2017).

The data from social protection were obtained from CPIA and insight was drawn from Osabohien (2017). This study made use of social protection to ascertain the protection quality of farmers who depend on agriculture in which poverty rates are higher than any other sets of people. Values for social protection range from 1 (weak or low level of social protection) to 6 (strong or high level of social protection). This is to ease in interpreting results. Thus, average values of 5 and 6 can be considered to be strongly protected, 4 and 3 can be considered to be partially protected, while 1 and 2 can partially be weakly protected (Osabohien, Afolabi, et al., 2018).

However, the empirical model for this research is adopted from the studies of Hamid and Ahmad (2009), Osuma, Ikpefan, Osabohien, .Ndigwe, and Nkwodimmah (2018). Thus, this model is specified as follows:

Figure 1. Average rate of poverty across ECOWAS countries (2007–2017)

Source: Authors' compilation, 2019, using Country Policy Institutional Assessment (2017) dataset.
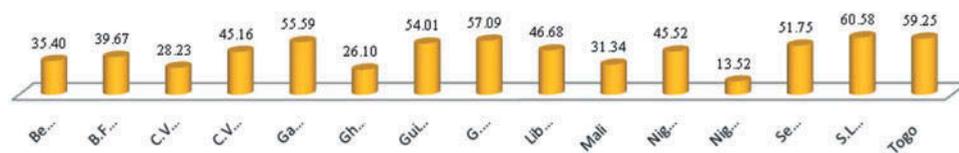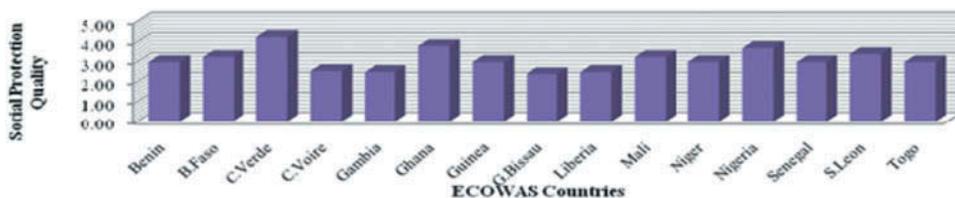

Figure 2. Average rate of social protection across ECOWAS Countries (2007–2016).

Source: Authors' compilation, 2019, using Country Policy Institutional Assessment (2017) dataset.

$$SDG1_t = \beta_0 + \sum_{t=1}^{n} \beta X + e \qquad (1)$$

where *SDG1* is Sustainable Development Goal 1 (SDG1) proxied by poverty; θ_0 is constant; X = agriculture value added; social protection; employment in agriculture; inequality. This model's variables are adopted from the empirical framework of others: poverty and agriculture value added (Ogundipe et al., 2016); agriculture employment is capable of lessening poverty as it increases household income for those engaged in it, and this is reflected in Turkey in 2014.

Improved agriculture production is necessary to reduce poverty, especially rural poverty as found in literature, but this study added more variables like inequality, literacy rate and social protection to fill the research gap. Given the foregoing assertion, therefore, Equation (1) is implicitly specified as follows:

$$POV \; = \; f(AVA, SOP, \; EMPA, INQ, LR) \qquad (2)$$

Equation (2) is specified in its explicit form as shown in Equation (3);

$$Pov_{it} = \alpha_0 Y_{it-1} + \alpha_1 ava_{it} + \alpha_2 sop_{it} + \alpha_3 empa_{it} + \alpha 4 inq_{it} + 5 lr_{it} + \mu it \qquad (3)$$

where *Pov* is poverty, *ava* is agriculture value added, *sop* is social protection, *empa* is employment in agricultural sector, *inq* is inequality, *lr* is literacy rate (See Table 2). The "*i*" and "*t*" represent entities (countries) and time (2007–2017), respectively; Y_{t-1} captures the lagged dependent variable to eradicate omitted variable bias (Ejemeyovwi et al., 2018). As mentioned previously, this research aims to see how the agricultural sector can be enhanced to raise its employment capacity in order to reduce poverty which is the pathway to the attainment of SDG1 (that is to end all forms of poverty by the year 2030).

4.1. Results

Table 2 portrays the summary statistics of variables. Findings revealed that the selected variables tend to have significant relationships with poverty. From columns 1, 2 and 3, the GMM results 1 (at lag3 1) showed a positive relationship between agriculture value added, employment, inequality and poverty while social protection and literacy level show a negative relationship with poverty, while GMM results 2 (at lag 2 4) and 3 (at lag 4 4) indicated the same relationship between the two main variables of interest, as illustrated in Table 2.

The advantages of SGMM estimator (Arellano & Bover, 1995) compared to traditional GMM estimator (Arellano & Bond, 1991) are clearly noticeable when units of the dynamic panel model are comparatively bigger than the study's timeframe. Notwithstanding, traditional GMM

Table 2. Summary statistics of the variables				
Variable	**Mean**	**Standard deviation**	**Minimum**	**Maximum**
Agricultural value added	30.4347	14.8201	−4.05040	65.5979
Poverty	47.4200	12.0571	23.1000	88.5000
Social protection	3.1133	0.5500	2.0000	4.5000
Agricultural employment	52.5112	14.9940	22.0000	78.4928
Inequality	42.3585	5.4257	31.4500	54.1400
Literacy rate	43.9926	17.1089	21.8229	86.8375

Source: Authors' computation via STATA 13, 2019.

estimator has overtime been seen to possess weakly (biased) finite sample properties when the series are extremely continuous (Blundell & Bond, 1998). Given such cases, lagged levels of series are solely poorly correlated with ensuing first differences, thereby causing feeble mechanisms for first-differenced equations (Ejemeyovwi et al., 2018). Blundell & Bond, 1998) and Arellano and Bover (1995) show that when extra moment restrictions are included, SGMM allows lagged first differences to be utilised as tools in level equations, which adjusts any bias that would arise from adopting standard GMM estimator. Utmost caution was undertaken in this research to ascertain control of GMM proliferation of instruments, which might otherwise outweigh endogenous variables. Also, it was noted that this model scaled through instrument validity test (Sargan/Hansen the AR(1) and AR (2) and the test for second-order serial correlation (Arellano & Bond, 1991). The results from the SGMM estimations are given in Table 3. Findings of Table 3 showed social protection coefficients for columns 1 (at lag 3 1), 2 (at lag 2 4) and 3 (at lag 4 4) with values of −6.2628, −6.3667 and −8.493 respectively. This means well-coordinated social programmes and policies have the potential of reducing poverty approximately by 6.3, 6.4 and 8.5 units, respectively. The same goes with literacy rate, as could be seen in column 1(at lag 3 1), column 2 (at lag2 4) and column 3 (at lag 4 4) with coefficients −0.1406, −0.0517 and −0.0711. It means that if the literary rate increases by 1%, this increase has the capacity of reducing poverty by 14.06%, 5.17% and 7.11%, respectively.

Furthermore, the results also reveal that agriculture (proxied by agriculture value added) is significant at 1% level and positively related to poverty. This means that greater rates of agricultural output induce a higher poverty rate. Moreover, employment in agriculture is similarly significant at 1% level and is positively connected to poverty, such that a greater rate of employment in agriculture leads to a higher poverty rate. In addition, social protection variable has significance at 1% but a negative relationship with poverty, so, effective social protection policies lower the rate of poverty.

Table 3. SGMM results (dependent variable: poverty)			
	SGMM Lag 2 4	SGMM Lag 4 4	SGMM Lag 3 2
Poverty (−1)	0.4227* (0.000)	0.0496 (0.64)	0.0587 (0.55)
Agriculture value added	0.1652* (0.000)	0.2342** (0.032)	0.2336* (0.009)
Social protection	−6.2628* (0.000)	−6.3667 (0.299)	−8.4930 (0.19)
Employment in agriculture	0.1731* (0.000)	0.0125 (0.929)	0.1257 (0.613)
Inequality	0.2237** (0.052)	−0.1632 (0.493)	−.04333 (0.814)
Literacy rate	−0.1406 (0.400)	−0.051* (0.811)	−0.0711 (0.693)
Constant	34.9530* (0.000)	62.0621* (0.026)	55.399** (0.005)
AR (1)Pr	0.950	0.125	0.105
AR (2)	0.796	0.147	0.103
Sargan test	0.10	40.99	29.33
Prob> F	(0.000)	(0.000)	0.000
Number of instruments	8	8	9
Number of groups	14	14	14

Source: Authors' computation using STATA 13, 2019. **Note**: Values in the parenthesis "()" are probability values, *and ** denote significant coefficients at 1% and 5% levels, respectively.

Lastly, the study found that literacy rate is significant at 5% level with a negative connection to poverty; hence, increased literacy rate lowers poverty rate.

5. Discussion

This research's outcomes buttress the results of past investigations on how poverty can be reduced through a well-coordinating agriculture and employment in line with effective social protection (such studies include Bayramoğlu, 2014; Egye & Muhammad, 2015; Omorogiuwa et al., 2014). Osabohien, Osabuohien et al. (2018) argued that social protection in agriculture is one of the most effective weapons to combat poverty in any given region. Social protection variable in this study is negatively related to poverty. This supports the theoretical belief that social protection directed to the agricultural sector makes the farmers less vulnerable to risk and shocks, and thus the lower the rate of poverty. In a more recent study, Osabohien, Matthew, Gershon, et al.(2019) also find that social protection policies when properly channelled to the agricultural sector have the capacity of increasing yields by 3% which is capable of reducing poverty in ECOWAS. But, the governments of ECOWAS countries need to do more in this regard, so as to help eliminate poverty from the region by 2030. The literacy rate is also negatively related to poverty and also supports the theoretical underpinning that a higher literacy rate should aid the reduction of poverty levels. This implication among ECOWAS economies is that the more educated farmers are, the more enlightened they will be in making use of mechanised implements in agricultural practice, and the higher the yields, this will help reduce poverty rate via the increment in their levels of income.

Acemoglu, Robinson, and Santos (2013) argued that the divergence among countries' level of development stems from the grounds that developing nations fail to establish a monopoly of violence in terms of the institutional framework (akin to social protection in this study) to combat inequality among citizens. This study confirmed the results of Acemoglu et al. (2013) as seen in inequality columns 2 (at lag 2 4) and 3 (at lag 4 4) with the coefficient of 0.2237, and it means that increase in inequality poses a danger of increasing the number of people who may sink in poverty by 22.40%. The worrying positive effect of estimated variables of agriculture results (employment and value added) showed that agriculture value added and employment in agriculture do not successfully yield a positive impact on poverty within ECOWAS. This is attributable to factors such as the sector's comparative low attractiveness, which makes it unable to pull productive labour from other sectors due to lack of social protection (Osabohien, 2017). In addition, the result also violates theoretical foundations that greater employment in agriculture would facilitate poverty minimisation. The rationale behind this outcome is proximately related to the reality that persons participating in agriculture around ECOWAS region have greater prevalence in the rural areas and most of these individuals still utilise traditional tools, which bring about low productive levels.

According to Tersoo (2013) who postulated that regardless of agricultural dominance among African sectors (as reflected by labour force employment of two-thirds of poor individuals situated in rural communities), sectoral production capacity is still low, thereby confirming the worry from agriculture result of GMM estimators in this study. In addition, the result of this study also violates the theoretical belief that agriculture negatively relates to poverty levels, so, higher agricultural output induces lower poverty. The probable explanation of this outcome from ECOWAS countries could be evident from the low income to the farmers from the agricultural produce coupled with the fact that agriculture is still been practised with the use of crude implements, which resulted in yields. Regrettably, despite the positive contribution agriculture could make towards the poverty reduction, governments of ECOWAS countries have neglected the agricultural sector due to inadequate provision of much-needed support systems.

From the empirical results obtained in this study, it is evident that the West African economies could use their agricultural potentials to reduce poverty levels and transform their economies. African agriculture has shown a recommendable progress in comparison to its dangerous stage in the last two decades. Conversely, progress is unequal across the ECOWAS countries. The countries that invested in their agricultural sectors, such as Burkina Faso and others, are now enjoying the

returns—better economic growth, decreasing rates of poverty, improved standard of feeding and a drift of the labour force out of farming. But, there is still much to do. This is especially true for ECOWAS that has not adequately promoted its small-scale farmers.

A few African countries may be able to exchange importation of agricultural commodities for poverty reduction; these nations will be at a relative advantage when compared with their counterparts. But, several nations, including some of the continent's largest, will not be able to feed their citizens with the importation of food alone, considering the adverse effect of deficit in their Balance of Payments accounts. A country like Cape Verde among other ECOWAS countries, for instance, will continue to depend heavily on importation for her food needs. Thus, agriculture holds a lot of opportunities for poor persons to boost their earnings. chances of poor families leveraging on such opportunities are reliant on probable exclusion by social norms or government sanctions on income-earning activities (for instance, females being excluded from credit markets); accessibility to saving and credit amenities (special protection benefits); and education (literacy) levels and social protection.

6. Conclusion and recommendations

This paper concluded that the attainment of SDGs by 2030 is feasible for the ECOWAS countries, if agricultural value added and employment in agriculture transmit a successful positive impact on poverty reduction in the West African sub-region. In a nutshell, the elimination of poverty (which is part of SDG 1) can only be achieved if farmers are encouraged financially, the provision of social grants that will help the farmers to make profitable returns from the practice of agriculture via an increase in agricultural output. This could engender more income to the farmers and consequently reduce poverty among them. Having examined the nexus of agriculture, employment generation and social protection in attaining the elimination of poverty (which is a part of SDG 1) by 2030, and in line with the investigative outcomes, these suggestions are proffered: first, government of ECOWAS nations should establish measures for educating and enlightening farmers on the relevance of practising mechanised farming, as it will aid less strenuousness that is experienced when using local tools such as hoes and cutlass. Moreover, it would emanate in greater agricultural yields and resultant incomes from agricultural produce, and this would subsequently boost revenue that is remittable to the government while lessening poverty levels. Secondly, the governments in these countries should also provide "soft loans" with low-interest rates to farmers complimented supplies of agricultural implements like fertilizers. This will help to trigger more individuals' attraction to agriculture and give jobs to a larger number of persons in urbana and rural places. This will also facilitate poverty minimisation by 2030. Lastly, the governments of these ECOWAS countries should implement social protection policies and programmes for farmers that will help reduce their poverty levels and increase investment and innovation in agriculture.

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