

## Extended Abstract

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<b>Paper/Poster Title</b>	<b>Implementation of Conservation Agricultural Practices as an Effective Response to Mitigate Climate Change Impact and Boost Crop Productivity in Nigeria</b>
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<b>Abstract</b>	<b>200 words max</b>
<p>Conservation agricultural practices aims to concurrently improve climate resilience, improve agricultural productivity and rural livelihood. This study examined the determinants of adoption and implementation of alternative package of conservation agricultural practices using household level survey data in Nigeria. A Multinomial endogenous switching regression (MESR) model was employed to estimate the factors influencing the adoption of conservation agricultural practices and productivities of adopters and non-adopters of alternative package of conservation agricultural practices. Significant variables such as age, gender, farming experience, farm size, formal education, access to extension services and membership in association were factors influencing the adoption and implementation of alternative package of conservation agricultural practices among the farmers. The result of the MESR-ATT indicates that adoption of alternative package of conservation agricultural practices to mitigate the negative impact of climate change improves the productivity of the farmers in the study area. To ensure effective implementation of alternative package of conservation agricultural practices among the farmers, the study suggest that stakeholders and government need to take the lead in the promotion of alternative package of conservation agricultural practices while creating enabling environment for effective participation of the other stakeholders.</p>	
<b>Keywords</b>	Conservation Agricultural practices, Climate change, Productivity, MESR, Nigeria
<b>JEL Code</b>	Environmental Economics Q5



<b>Introduction</b>	<b>100 – 250 words</b>
<p>It is becoming more and more obvious that climate change and rural livelihoods are closely related. Less rainfall is anticipated in SSA, which will have a detrimental impact on the region's long-term agriculture productivity (Lobell et al., 2008; Niang et al., 2014). By 2050 and 2100, rainfall in Nigeria is expected to decrease by 3 and 0.6%, while the country's temperature is expected to rise by 1.9 and 2.3°C (Hamududu and Ngoma, 2019). Conservation agriculture (CA) has been widely advocated as a substitute for tillage-based conventional agriculture and as a method of crop husbandry that can reconcile these frequently conflicting objectives in response to the harsh climate change impact on agriculture (Jat et al., 2020). CA is an agronomic technology management method that enables minimal soil disturbance, upkeep of a permanent soil cover, and spatiotemporal diversification of crop species (Pittelkow et al., 2014). In other scholarly publications, sustainable intensification through CA agricultural methods has been proposed as a means and approach to increase smallholder output, particularly in SSA, according to Brown, Nuberg, and Llewellyn (2018).</p> <p>However, scaling up the usage of these technologies has remained unexplored and poorly documented in many SSA nations, including Nigeria despite the immense advantages. Farmers' productivity goals, limitations, and risk tolerance are key considerations in the adoption process, along with the anticipated advantages and up-front expenses of CA. In light of this, it is essential to give this topic the attention it deserves because it pertains to reducing the harsh effects of climate change and increasing farm output.</p>	
<b>Methodology</b>	<b>100 – 250 words</b>
<p>The study was carried out in the Southwest of Nigeria, which is made up of the six geopolitical states. The research locations cover an area of roughly 77, 818 km<sup>2</sup> and are situated between latitudes 6° 21' and 8° 37' N and longitudes 20 31' and 6° 00' E. A multistage sampling technique was employed in this study to choose participants from the study area. The sample size for the investigation was established using the sample determination formula at a 95% confidence interval and a 5% margin of error (2016). A total of 300 respondents was selected for the study. The responses to a well-structured questionnaire, was utilized to collect primary information. Data on their socioeconomic attributes, the varieties of maize they adopted, the amounts of inputs and outputs related to maize, etc., were all obtained. An analytical methodology used to evaluate the selection of various technique combinations in smallholder farming systems is the multinomial logit (MNL) regression (Babulo et al., 2008).</p> <p>To investigate the relationship between productivity and net farm income variables and a group of covariates (<math>\alpha</math>) for a particular technology choice, the MESR model entails estimating an Ordinary Least Squares (OLS) regression with selectivity adjustment.</p> <p>The average treatment effect (ATT) on the treated was calculated using the multinomial endogenous switching regression (MESR) by comparing the anticipated values of the outcomes of the treated (adopters) and untreated (non-adopters) in real (actual) and unreal (counterfactual) situations.</p>	

<b>Results</b>	<b>100 – 250 words</b>
<p>Based on the survey result, 11% did not implement any of the CA practices on their farm, 12%, 13.7% and 14.3% had implemented reduced tillage, maintenance of soil cover and crop rotation respectively as climate change mitigation strategies. About 11.3% had combined reduced tillage and soil cover, 14.7% had combined soil cover and crop rotation, 12.3% had combined reduced tillage and crop rotation while 10.7% had combined and implemented all the three CA practices on their farm as climate change mitigation strategies.</p> <p>With respect to the factors influencing the implementation of conservation agricultural practices, age, gender, farming experience, farm size, formal education, access to extension services and membership in association were significantly influenced the adoption and implementation of alternative package of conservation agricultural practices among the farmers.</p> <p>The result from this study on crop productivity showed that farmers obtained significant yield in kg/ha from implementation of alternative package of conservation agricultural practices. It was found that farmers who implemented the combination of reduced tillage and maintenance of soil cover had the highest yield gain of 1246kg/ha closely followed by the combination of maintenance of soil cover and crop rotation with a yield gain of 1245kg/ha. The results of the ATT showed that the income effect of N1,356 /ha for the adoption and implementation of reduced tillage and maintenance of soil cover is the highest followed by N1,272/ha for the adoption and implementation of maintenance of soil cover and crop rotation.</p>	
<b>Discussion and Conclusion</b>	<b>100 – 250 words</b>
<p>In this study, we assessed the factors influencing the implementation of alternative package of conservation agricultural practices to mitigate climate change impact while boosting farm productivity (yield and net farm income) of the famers in Nigeria. Based on the findings of the study, it is important that efforts to mitigate the negative impact of climate change through adoption and implementation of alternative package of conservation agricultural practices should focus on improving the significant variables of interest affecting its adoption. For example, there is a need to improve the provision of extension services to the farmers through recruitment of qualified extension agents while also training them to equip them with necessary skills. Farmers are also encouraged to join farmers’ organization for them to enjoy group dynamism and have access to farm inputs including new technology that would help them improve their farm productivity.</p>	