ASSESSMENT OF AGRICULTURE-DRIVEN DEFORESTATION AND THE EFFECTS ON CLIMATE VARIABILITY AMONG FARMERS IN OGUN STATE, NIGERIA

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ABSTRACT

This study examines the role of Agriculture-driven deforestation in influencing climate variability, perceptions and experiences among smallholder farmers in Ogun State, Nigeria. With increasing land-use changes attributed to agricultural expansion, the study aims to assess the nexus between forest clearing and localized climate variations. Primary data were collected through structured questionnaires administered to 200 respondents selected through multistage sampling. The data were obtained on the respondents socio-economic characteristics, adaptation strategies initiated against agriculture-driven deforestation and awareness of climate variability while satellite imagery between year 2013 and 2023 was collected to assess the pattern of land use and land cover changes (LULC) and to determine the effects of agriculture driven deforestation on climate variability with a focus on changes in temperature and carbon dioxide. Data were analysed using frequency counts, percentages, means, logistics regression model and Landsat satellite images. Results show that majority (60.5%) of the respondents were male, most (93%) of respondents had formal education, most (93%) of the respondents were using government land, 85% were aware of the influence of climate variability, 81.5% practiced pure cultivation, 86.0% were married with an average age, household size, farm size, farm experience, and monthly income of 55.1 years, 4 persons, 15.1 ha, 13 years and ₦158,150.00 respectively. The major adaptation strategies initiated against agriculture-driven deforestation were agroforestry ($\bar{x}$ = 4.00), awareness/education ($\bar{x}$ = 4.00), and paying farmers to conserve ecosystem ($\bar{x}$ = 3.95). LULC statistics shows that water body increased from 82Km^2 to 90.03Km^2, vegetation cover decreased from 11,618Km^2 to 9,720.24Km^2, developed area increased from 507.42 km^2 to 1,443.7km^2 while agricultural land increased from 4,476Km^2 to 4,922.02Km^2 between 2013 and 2023 respectively. The temperature range between 2013 and

2023 was slightly lower, temperature decreased with increase in vegetation cover over the years at about 61% relationships, there was a similar negative relationship between vegetation cover and carbon dioxide concentration at 84%. Logistic regression model shows that income (β= 1.000 $p<0.10$), practice preferred (β = 1.653, $p<0.10$) and land ownership (β= 0.558, $p<0.05$) negatively influenced awareness of climate variability while non-farm income (β=1.000, $p<0.01$) positively influenced awareness of climate variability. The study concludes that unchecked agriculture-induced deforestation exacerbates climate variability in Ogun State leading to temperature variations, loss of stored carbon as carbon dioxide into the atmosphere and increased greenhouse gas emissions resulting in global warming, the assessment revealed that without secured land, farmers focused on short-term gains, rather than long-term sustainability, they overexploited natural resources leading to escalated deforestation, soil degradation and loss of biodiversity. This study recommended an urgent need for forest eco-system management, government adaptation policy decisions contributing to the understanding of LULC and climate smart agricultural practices, reforestation initiatives as well as policy incentives to promote sustainable land use.