

GLOBAL WARMING AND ATMOSPHERIC CARBON: IS CARBON SEQUESTRATION A MYTH OR REALITY?

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Abstract: Biotic and abiotic carbon sequestration currently seems to be the only viable tools at the disposal of mankind for mitigating greenhouse gas (GHG) emissions and thus a remedy for tackling global warming challenges. This study accesses the global carbon capture and storage (CCS) programme: the level of success in its implementation and its impact using

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panel data from eight countries, the majority of which have begun one or more operational CCS facilities. To achieve this objective, fifteen years period time series data was sourced for the eight selected countries based on data availability, namely the United States (US), the United Kingdom (UK), Canada, China, Australia, Norway, South Africa, and Nigeria; ranging from 1990 to 2015. The panel ARDL results show that the explanatory variables, global industrial production (LIP), Electricity production (LEP), Agricultural production (LAP), transportation (LTR), and energy supply (LES) have a long-run relationship with the dependent variable (LGHG emissions). While the short-run results show that none of the variables have a significant contribution to LGHG emissions. In the long-run results, LIP and LTR significantly contribute to the reduction of LGHG courtesy of the CCS programme while LEP, LAP, and LES contribute to a rise in the LGHG emission. The cross-sectional results show that all the variables have significant impacts on LGHG in all the sampled countries except Australia. Suggesting that, the CCS programme is viable for mitigating global warming and climate change and therefore should be considered by the various countries of the world.

Keywords: CO₂ Capture; Industrial production; Electricity production; Agriculture production; Global Warming; Panel ARDL.

JEL code: Q53, L7, L94, N5, Q54, C23.

1. Introduction

Environmental issues bordering on greenhouse gas emissions amongst other things and their severe impact on the planet and in turn on the well-being of all lives (both plant and animal) on earth have formed the center of global debate in recent literature. This concern has been made one of the priorities in the United Nations global goals (SDGs). It is a stylized fact that this degradation of the environment ensues from human activities which include energy production, industrial production with consumption activities (Fawzy, et al., 2020; Gajić et al., 2018; Edenhofer et al., 2014). According to Medlock (2009), the process of achieving economic growth comes with a prize and that is environmental degradation which is at its maximum at the take-off and industrialization stages but drops at the advanced stage of development (which is service-oriented activities). This claim is further supported by the environmental Kuznets theory (Uchiyama, 2016).

Studies have it that the bulk of the environmental degradation comes from the production and consumption of energy commodities (Orji, Ogbuabor, Ogwu and Anthony-Orji, 2021; Fawzy, et al., 2020). This is obvious in many countries such as Nigeria with the huge mineral endowment, where according to the Earth Trend Country Profile (2003) report, about 2.5 billion cubic feet of gas is flared annually from energy production activities, this amount to 40% of the overall gas consumption in the entire African continent and thereby making it one of the single largest sources