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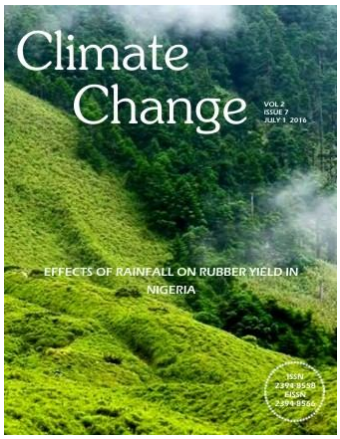
Climate Change

About the Cover



The study examined the effects of rainfall and other factors on rubber yield in Nigeria for the period 1970 to 2012. The methods of analysis employed in the study were mainly error-correction model (ECM) within the context of co-integration theory. The results show that all the variables were not stationary at their levels and thus, they were difference once to attain stationary. Statistical significance of the error-correction term validates the existence of an equilibrium relationship among the variables. Rainfall was most significant, indicating that increase in rainfall will affect rubber yield as this will reduce the number of tapping days of rubber stands. Rubber prices were also found to determine rubber yield in Nigeria. The study therefore recommends that rain guard should be attached to rubber stands during the raining season to prevent the washing away of latex by rain (Ref: Mesike CS, Agbonaye OE. Effects of rainfall on rubber yield in Nigeria. *Climate Change*, 2016, 2(7), 141-145); (Image: http://il9.picdn.net/shutterstock/videos).

OPINION

Global Warming is good

Terence J Hughes

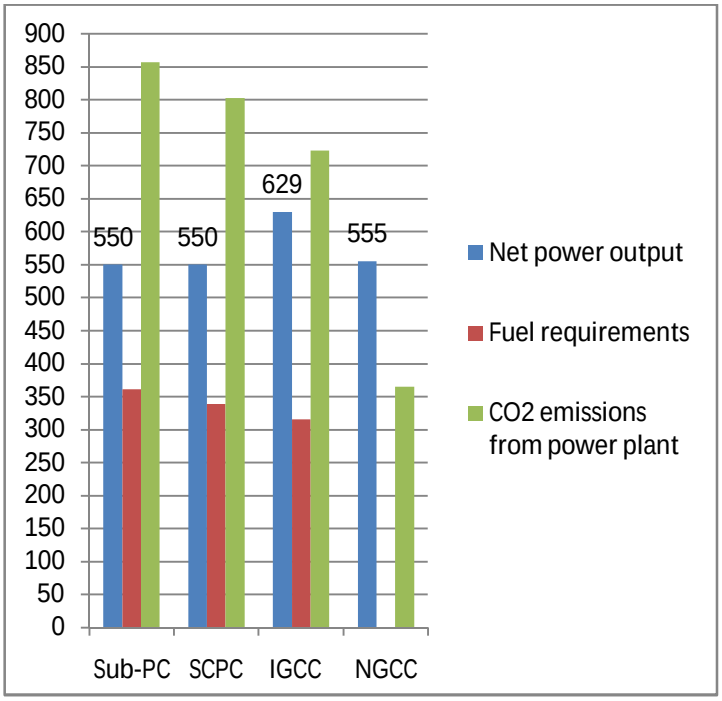
For some years now, some of my glaciological colleagues (Bob Thomas whom I brought to the University of Maine for a few years before he went to NASA), Jay Zwally (who funded my first glaciological proposal when he was at NSF, and then founded the glaciology program at NASA) and Craig Lingle (my first graduate student at the University of Maine) have urged me to march in lockstep with Albert Gore, the Drum Major in the parade denouncing global warming as an unmitigated disaster. I have demurred for the following reasons.

Climate Change, 2016, 2(7), 130-133

METHODS

Advance thermal Power Plant technology to reduced environmental pollution

Amrat Kumar Dhamneya, Shantanu Rajput, Rajput SPS, Alok Singh



The objective of this paper is to analyse performance of various power generation plant, issue of environmental degradation and effect on climate. In this paper, examine about innovative technique to improve thermal efficiency of thermal power plant. Mainly electric power generated by coal and it is around 69.06% of coal utilized from coal fired thermal power plant for power generation in India. But now a day these type of coal fired thermal plant is diffuse environmental pollution and enhancement of ozone layer depletion. Other issue is requirement of fossil fuel is day by day progressive. The key roles play of power generation in economic growth of country. So super critical technology increase the thermal efficiency (around 5 to 10%) of plant and decrease the environmental pollution around 5 to 10%.

Climate Change, 2016, 2(7), 134-140

ANALYSIS

Effects of rainfall on rubber yield in Nigeria

Mesike CS, Agbonaye OE

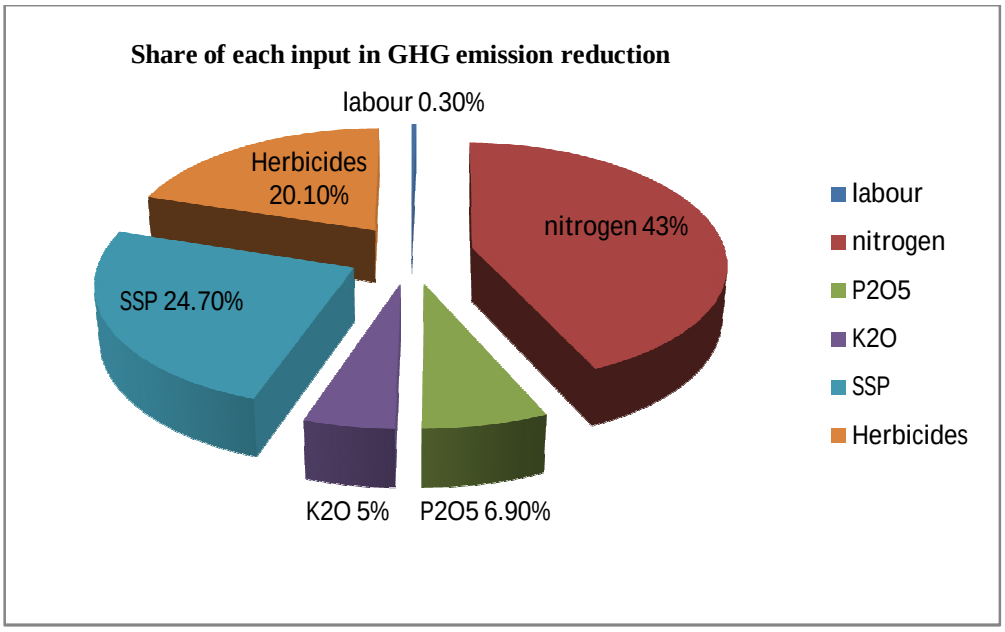
The study examined the effects of rainfall and other factors on rubber yield in Nigeria for the period 1970 to 2012. The methods of analysis employed in the study were mainly error-correction model (ECM) within the context of co-integration theory. The results show that all the variables were not stationary at their levels and thus, they were difference once to attain stationary. Statistical significance of the error-correction term validates the existence of an equilibrium relationship among the variables. Rainfall was most significant, indicating that increase in rainfall will affect rubber yield as this will reduce the number of tapping days of rubber

stands. Rubber prices were also found to determine rubber yield in Nigeria. The study therefore recommends that rain guard should be attached to rubber stands during the raining season to prevent the washing away of latex by rain.

Climate Change, 2016, 2(7), 141-145

Global Warming and Tragedy of the Commons: Comparative Evidence of Greenhouse Gas Emission (CO_2) between Efficient and Inefficient Sesame Producers in Jigawa State of Nigeria

Sadiq MS, Singh IP, Umar SM, Grema IJ, Usman BI, Isah MA



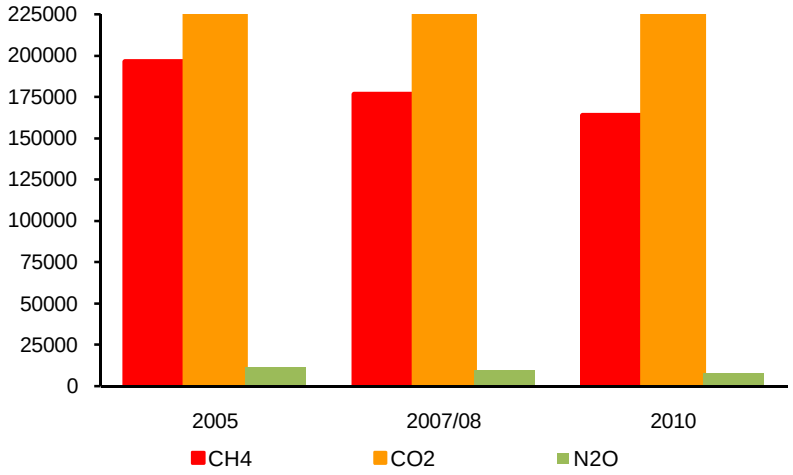
Data for this research were elicited from 99 sesame farmers in Jigawa State, Nigeria via multi-stage sampling technique. Energy efficiency was studied and degrees of technical efficiency (TE), pure technical efficiency (PTE) and scale efficiency (SE) were determined using data envelopment analysis (DEA). Additionally, wasteful uses of energy by inefficient farms were assessed and energy saving of different sources was computed. Furthermore, the effect of energy optimization on greenhouse gas (GHG) emission was investigated and the total amount of GHG emission of efficient farms was compared with inefficient ones. Results revealed that only 9.4% DMUs were technically efficient and the average TE score was 0.624; based on BCC model 34.4% DMUs were identified to be efficient and the mean PTE score was 0.79; while based on scale efficiency only 12.5% DMUs were efficient, and the mean SE score was 0.804. Furthermore it was observed that approximately 38.17% (1505.58MJha^{-1}) of overall input energies can be saved if performance of inefficient DMUs rose to a high level. Comparative results of GHG emissions for efficient farmers and inefficient farmers revealed that the amount of CO_2 emissions in efficient DMUs was less than inefficient DMUs. Moreover, findings inferred that, by energy optimization, total GHG emission can be reduced to an estimated value of 21.87 KgCO_2eqha^{-1}.Generally, the application of data envelopment analysis method can improve energy efficiency and GHG emissions in sesame production, significantly.

Climate Change, 2016, 2(7), 146-165

Trend analysis of greenhouse gas emissions in the Veneto Region

Pierantonio Belcaro, Lorenzo Mengotti, Laura Susanetti

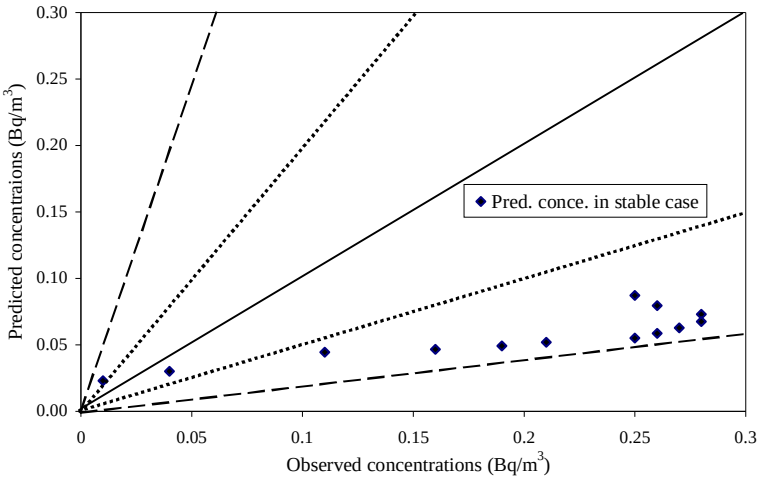
This study focuses on data of the greenhouse gases emissions in the Veneto Region taken from the regional inventory of atmospheric emissions (INEMAR) in the three periods 2005, 2007/08 and 2010. The analysis concerns CO_2, N_2O and CH_4. It considers the main emissions activities of the SNAP97 nomenclature. Through this study we can observe how the situation relative to greenhouse gas emissions in the Veneto Region in the period 2005-2010 is improving. Although methane and nitrous oxide present far superior global warming potentials, the strong predominance of carbon dioxide in terms of quantity means that it turns out to me the gas mainly responsible for the greenhouse effect. In fact, by converting the three greenhouse gases into CO_2 equivalent, the emissions distribution per SNAP macro sector presents characteristics very similar to that of CO_2. In this respect, the biggest issue is confirmed to be road transport emissions, with particular attention to be paid to passenger cars which produce almost 56% of CO_2 equivalent for the region.



Climate Change, 2016, 2(7), 166-179

Studying the effect of vertical variation of wind speed and eddy diffusivity on the advection-diffusion equation

Khaled SM Essa, Soad M Etman, Maha S El-Otaify



The three dimensional steady state advection-diffusion equations have been solved analytically to simulate the dispersion of contaminants in the atmospheric boundary layer (ABL). The solution is based on the assumption that the concentration distribution of pollutants in the crosswind direction has a Gaussian distribution. The analytical solution has been obtained by taking into account the dependence of the vertical eddy diffusivity and the wind speed on the vertical height z. The derived solution has been applied to calculate the concentration of Iodine-131 using data collected from the experiments performed to collect air samples around a Research Reactor. Statistical measures were applied to evaluate the performance of the derived model. The results are discussed and presented in tables and illustrative figures.

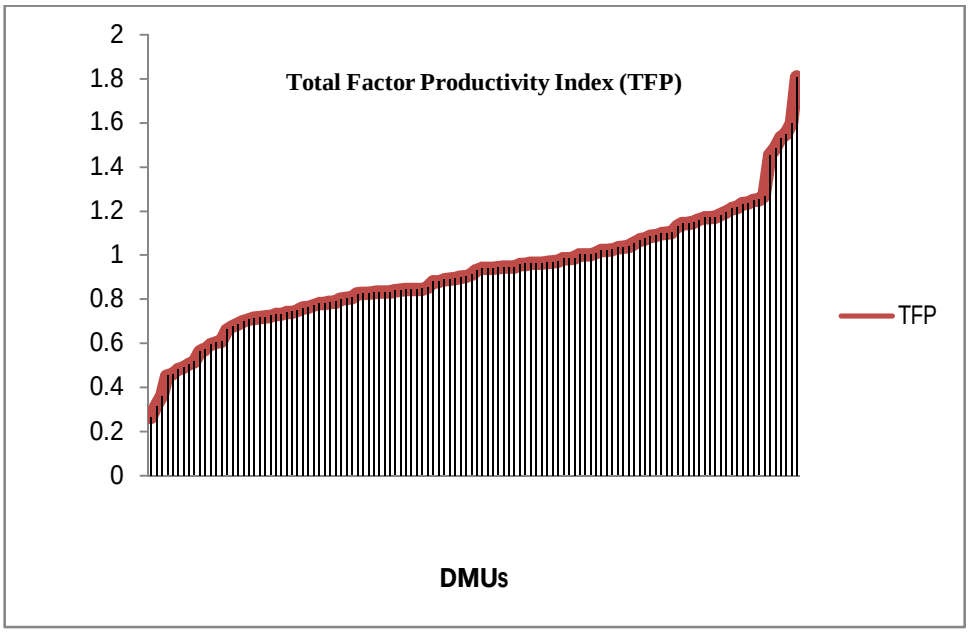
Climate Change, 2016, 2(7), 180-191

Comparison of GHG Emissions of Inefficient and Efficient Small Scale Maize Farmers in Niger State of Nigeria using Data Envelopment Analysis

Sadiq MS, Singh IP, Umar SM, Grema IJ, Usman BI, Isah MA, Lawal AT

This research empirically compared GHG emissions between efficient ant inefficient maize producers in Niger State, Nigeria using Data Envelopment Analysis (DEA). Data for the study were obtained from Kuta agricultural zone in the state viz. 120 active maize farmers using multi-stage sampling technique. Instruments for data were pre-tested questionnaire coupled with interview schedule. Energy efficiency of maize farmers was studied and degrees of overall technical efficiency (CCR), pure technical efficiency (BCC) and scale efficiency (SE) were determined using Data Envelopment Analysis (DEA). Additionally, wasteful uses of energy by inefficient DMUs (farms) were examined, and energy saving of different sources estimated. Furthermore, the effect of energy optimization on greenhouse gas (GHG) emission was investigated and the total amount of GHG emission of efficient DMUs was compared with

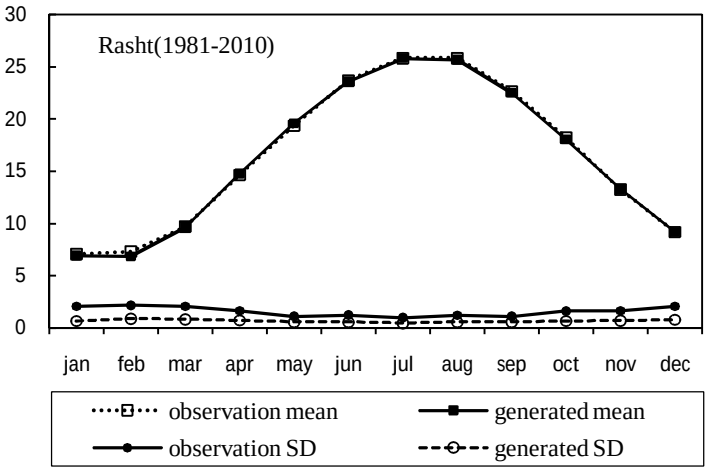
inefficient DMUs. Results revealed that approximately 9.2% of the farmers were technically efficient with an estimated mean TE of 0.68. Furthermore, when BCC model was assumed, 24 farmers (DMUs) were identified to be locally efficient (20%), with mean PTE of 0.78. From the results, it was inferred that 32% (768.89MJ ha^{-1}) of overall input energies can be saved if the performance of inefficient DMUs (farms) rose to a high level. Comparative results of GHG emissions for efficient farmers and inefficient farmers revealed that the amount of CO_2 emissions in efficient DMUs was less than inefficient DMUs. Generally, application of data envelopment analysis method can significantly improve energy efficiency and GHG emissions in maize production in the state.



Climate Change, 2016, 2(7), 192-211

Simulation of Global Warming Effect on Irrigated Rice Phenology in the Major Rice Production Region of Iran, Rasht

Fatemeh Rabbani, Hossein Mohammadi, Siavash Mohammadi



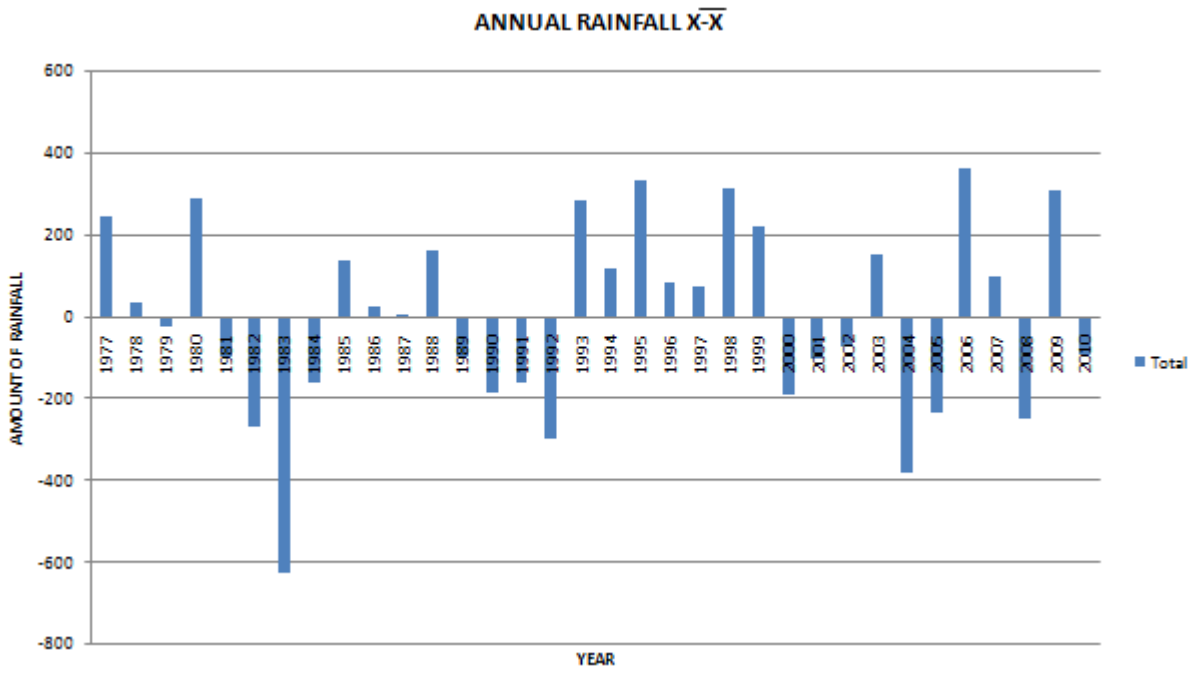
The effects of global warming on crop production and food security are of concern and have been extensively evaluated by various simulation models. The effect of future climate on rice phenology was investigated under climate change scenarios in Rasht station in this study. Data for this research includes the meteorological, soil and crop management data. Meteorological data include the daily data of minimum temperature, maximum temperature, solar radiation and precipitation during 1981-2010 and monthly temperature and precipitation of general circulation models during 1971-2000. Soil and product management data were provided from field experiment in the Iranian Rice Research Institute in Rasht, from 2008 to 2009. We used stochastic weather generators (Lars-WG) for downscaling of climate model. The prediction of climate did using of ECHAM5 model under of SRA1B, SRA2 and SRB1 scenarios. This model was validated using RMSE and MAE. Ceres-Rice model was used for simulating of rice phonology in two

irrigation regimes (continuous submergence and irrigation at 5-day intervals). Results show that minimum and maximum temperature will increase in the Rasht during the rice-growing season. Simulation of rice phenology showed the beginning of Panicle Initiation, an thesis and physiological maturity day will happen earlier with increasing of temperature in continuous submergence and will not happen earlier with increase in interval of irrigation. Also, the beginning of phonological stages will delay with increasing of temperature above 1°C even in continuous submergence.

Climate Change, 2016, 2(7), 212-222

The effect of climatic changes on land use and land cover in spatial development in Port Harcourt: Nigeria

Augusta Ayotamuno, Akuro Ephraim Gobo



The city of Port Harcourt has experienced a lot of changes on Land Uses and Land Cover which has had an impact on the spatial pattern of the city. This study hopes to identify how the varying climatic changes and elements have affected the spatial pattern of Port Harcourt and to ensure that there is sustainable development. The methodology used was Geographic Information Systems (GIS) and remote sensing which provided a cost effective and accurate alternative to understanding landscape dynamics. Digital change detection techniques based on multi-temporal and multi-spectral remotely sensed data was also used. Objectives of the Study are to examine the spatial pattern of Port Harcourt between the periods of 1984 – 2014. To ascertain how climatic factors have affected the spatial pattern in Port Harcourt. To determine the present state of Land Use and Land Cover in Port Harcourt and how it has been affected by climatic elements. The result of the study showed that there have been climatic deviations in rainfall and temperature values and very obvious changes in the spatial pattern of Land Use and Land Cover between 1984 to 2014. The Built – Up area showed an increase from 16.50% in 1984 to 51.38% in 2014. A lot of development has taken place using up most of the Gallery Forest, Vegetation area and the Water Bodies. Development of Built – Up area needs to be controlled so that all of the vegetation is not used up because the city needs some vegetation to allow the city breath.

Climate Change, 2016, 2(7), 223-234